

Improving the Innovation Function of Industrial Districts in Thailand

Yasuhide OZAWA

Nisit PANTHAMIT

Introduction

Thailand is one of the original members of the Association of Southeast Asian Nations (ASEAN) and has been instrumental in the economic development of its constituent countries. In Thailand, the utilization of private capital is recommended, and foreign companies representing specific industries tend to be nucleated in a certain region; for example, the automotive industry around Bangkok, the electric/electronics industry around Ayutthaya, and the electronic component/electronic device industry around Chiang Mai. Such regional lumps are referred to as specific industrial districts or industrial clusters. In industrial clusters, companies build regional production networks characterized by relationships of cooperation and competition. Such networks beget benefits in terms of economies of scale/scope and securing competitive advantage.

In this study, we would like to consider characteristics of the relationships between companies in industrial clusters and the function of industrial clusters for the reinforcement of industrial competitiveness.

Chapter I Policy interventions favoring foreign firms in Thailand

1. Economic policy dynamics in Thailand

(1) Overview of Thai economic policy

A basic tenet of the Thai economic policy is that the government strategically and incrementally facilitates conversion of the industrial structure from an agricultural orientation to manufacturing and service industries. This facilitation can be conceived as follows: ①Promotion of a policy aimed at import substitution, ②Fostering export industries, ③Regional dispersal of industries and industrial advancement. For each of these three stages, the rigid timing is difficult to predict and identify. The basics of this economic policy have been effective, and have provided a platform for flexibility vis-à-vis investment promotion. A key characteristic of Thai economic policy is effective use of investment from the private sector; ergo, policy interventions aim to encourage and maximize the use of private

capital in investment.

In the promotion of policy aimed at import-substitution[Ⓐ], the purpose was to protect and nurture domestic manufacturing industries that produces target products in Thailand. Toward this objective, protectionist tariff interventions were continued until the 1980s to bolster manufactured goods, including consumer goods with a relatively low duty on raw materials.

Even when fostering export industries[Ⓑ] began, this tariff intervention was continued. However, regarding the type of industry that investment encouragement law supports, when the company imports production machines, measures are geared toward exempting them or reducing import taxes on them. In addition, when companies produced export products, measures to exempt them from the import taxes on raw materials were taken. It is difficult to harmonize fostering export industries with protecting domestic manufacturing industries. Because domestic products protected via high duties are sold stably in the home market, that domestic industry is not internationally competitive in qualitative terms. It was not easy to follow a process whereby the export industry and domestic industry work synergistically to benefit each other.

Since the establishment of the ASEAN Free Trade Area (AFTA) in 1992, Thai economic policy has gradually advanced in the direction of trade liberalization and investment, accelerated by the Asian currency and economic crisis of 1997. The current investment encouragement law is suggestive of a prevailing view that industrial dispersion and industrial advancement are pre-eminently important[Ⓒ].

(2) Investment encouragement policy vis-à-vis foreign capital

Investment encouragement policy is characterized by minimizing restrictions through investment encouragement law. However, the type of industry to be encouraged is not determined in investment encouragement law specifically. The Board of Investment in Thailand (BOI) has been organized based on investment encouragement law and type of industry that the BOI determines as needed becomes “the encouragement type of industry.” Along the industrial development trajectory of Thailand, the type of industry required gradually changes. In the 1990s, an important point was put for the promotion of the manufacturing industry. So, as a type of industry to support production, metal working, such as die, casting, metal heat treatment was appointed as the encouragement type of industry. In addition, the service industry to develop the manufacturing industry including the investment support office, etc. was appointed as an encouragement type of industry. Support measures through investment encouragement law include ①reduction/exemption of corporation income tax, ②reduction/exemption of taxes when company imports machines, ③reduction/exemption of the import tax on raw materials for export products.

In addition, for foreign capital, there is preferential treatment to accept property on land, and to handle the employment of foreign engineers outside of the Immigration Act. The preferential

treatment regarding land is different in different areas (zones) in order to have some control over the promotion of dispersion. Therefore, tax reduction/exemption will vary according to zones even within industry types.

(3) Recent changes in Thai investment encouragement policy

In recent years, Thai economic policy has succeeded in advancing the economy. Changes in policy focusing on industrial advancement are reflected in the operation of the investment encouragement law. Furthermore, the Thai government aims at shifting to become a high income country in the long run.

Advancement of the industrial structure is indispensable to evade the middle income country trap, and to shift to becoming a high income country. In this regard, 10 types of industry were identified as industries that substantively stimulate growth: ①Next Generation Automotive, ②Smart Electronics, ③Affluence, Medical & Welfare Tourism, ④Agriculture and Biotechnology, ⑤Food for the Future, ⑥Robotics, ⑦Aviation and Logistics, ⑧Biofuels and Biochemical, and ⑨Digital, and ⑩Medical Hub.

Further, the government divides these into existing industry (①-⑤) and future industry (⑥-⑩), and has formulated a strategy that promotes each industry. In the short and medium term, the economy of Thailand secures robust economic growth by promoting industry of ①-⑤, while the economy of Thailand is envisaged to realize rapid growth in the long term by promoting future industry of ⑥-⑩. The government plans to shift to becoming a high income country by these measures. These are shown with Thailand 4.0 (D) ¹⁾.

Importantly, the Thai government has illustrated its acknowledgment and support for interventions that can be described in terms of "cluster policy." A cluster policy is a policy to push forward intensive industrial development and diffusion, reinforcing competitiveness of designated industries in suitable locations. The Thai government has identified automotive, electronics/communication, petro-chemistry/chemical, and digital industries as being amenable to cluster-type interventions. As a condition for companies to receive favor from industrial cluster policy, the company must cooperate in human resources development or technical improvement, including the acceptance of interns talented persons from an educational institution or the research organization which located in area for of the cluster.

2. Contemporary investment by foreign firms

(1) Characteristic of foreign capital investment in Thailand

When an overseas company carries out direct investment in Thailand, various regulations pertain. With progress of liberalization concerning trade and investment, the extent of regulation has

decreased. For example, until 2000 there was a limit (proportional restrictions on overseas capital) as to the capital structure of investment where foreign capital penetrated the domestic market.

Investment in Thailand is divided into investment to receive support by investment encouragement law and investment outside of investment encouragement law. Most of the foreign companies that invest in the manufacturing industry apply for investment encouragement law support. However, this law is not a preferential law for foreign capital. Indeed, it aims to encourage investment generally and as such half of the applications made for support under this law are from Thai entities.

In terms of direct investment into Thailand, at the end of 2016, most came from Japan. Then, in order, Singapore, United States, Netherlands, Hong Kong, and the Virgin Islands. Investment from Japan amounted to 71,527 million US dollars, accounting for 36.2% of the total. Indeed, Japanese investment was more than double that of Singapore (which is in second place) (29,214million US dollars).

(2) Japanese investment in Thailand

In Thailand, the country carrying out the most investment is Japan; clearly Thailand becomes an important investment area for Japanese companies. Direct investment into Thailand by the manufacturing industry of Japan began in the 1960s. Thereafter investment from Japan increased in the late 1980s, in the mid-1990s, in the late 2000s, and again after 2010. In terms of direct investment into Thailand by the manufacturing industry of Japan at the end of 2016, according to the type of industry, the transportation machine industry accounted for 1,235 billion yen, and is the largest contributor. Investment by the transportation machine industry is 30.9% of the total. Next, in order, the electric machine industry is in second place (809 billion yen, 20.2%), followed by the iron/non-iron industry (506 billion yen,12.7%). Together, these three types of industries account for 63.8% of the whole.

After the 1970s, the general machine industry and transportation equipment industry maintained a high share throughout. Agriculture, farm products, and light industries remained important until the 1980s. After the late 1980s, the electric machine industry increased. Furthermore, concerning a more recent trend, the chemical industry and paper manufacturing increased from the late 1990s while in terms of services, public works projects increased from the late 2000s. Change in the investment type of industry correspond to changes in Thai industrial structure. The industrialization of Thailand advanced from labor-intensive industries to technical capital-intensive industries, with a nascent trend toward a more service based economy.

Chapter II The formation of industrial clusters in Thailand

1. Characteristics of regional industrial clusters

(1) Characteristics according to the type of industry and direct investment into Thailand

Among foreign investments authorized by the Board of Investment (BOI), the proportion of Japanese-affiliated companies has consistently exceeded 30% for the past ten years. Most notable, it is the auto industry which has pulled investment from Japan, followed by electricity, electronics industry. Around 60% of Japanese overseas investment in the electronics industry has accrued to Thailand over a three-year period from 2011 through 2013.

In recent years, increases with respect to the chemistry/paper industry and the service/infrastructure industry are particularly noteworthy. Concomitant with this, declines can also be observed in other domains, such as the 2015 reduction in metalworks investment. With regard to the increase in infrastructure, photovoltaic power generation-related investment contributed substantively. In 2015, service/infrastructure accounted for the largest share of investment. Increasing investments in air transport are also worth highlighting.

(2) Regional direct investment trends

A regional characteristic of Japanese-affiliated companies in Thailand is that many of these companies concentrate in and around Bangkok (Bangkok-wide area: Bangkok + the outskirts + the suburbs). The Thai government actively promoted investment in areas outside of Bangkok. However, many Japanese companies chose locations in the Bangkok-wide area because of access to the harbor and the relationship with business partners and associated firms. Thus Japanese companies have tended to accumulate mainly in the Bangkok-wide area, but specific places of accumulation differ by industry type.

Agriculture, the farm products industry, and light industries are located in many places across Samut Prakan Province and Pathum Thani Province in the outskirts of Bangkok. In terms of general machinery, the transportation equipment industry, chemical industry, and paper manufacturing industry are substantively located in Ayutthaya Province, Chonburi Province, and Rayong Province in the suburb regions of Bangkok. The port of Laem Chabangt and of Map Ta Phut were partly created due to the general machinery and transportation equipment industries being concentrated in the southeastern part of Bangkok including Chonburi Province and Rayong Province. The chemical industry developed with a natural gas field having been discovered in the Gulf of Thailand. Mineral, ceramics, and basic metal industries are located predominantly in Chonburi Province and Rayong Province, while the electric machine industry is located substantively in the northern part of Bangkok including Ayutthaya Province. There are many locations occupied by service industries, including public business entities in Bangkok, Samut Prakan Province and Chonburi Province with locations in

Bangkok accounting for 40% of the whole country.

In terms of temporal changes, there were many investments in Bangkok and its outskirt provinces (in particular Samut Prakan Province and Pathum Thani Province) until the early 1980s. However, locations in the suburb regions (particularly Ayutthaya Province, Chonburi Province, and Rayong Province) increased subsequently to the extent that these locations now dominate in terms of investment compared to the outskirts. This change mimics the changes in the Thai industrial structure and expansion of the industrial area.

As already noted, many Japanese companies chose locations in the Bangkok area. Not only are many companies concentrated there, but also supply chain networks between companies have been established with the progress of the time. As a result, something sticky increased about the local action of the company. At the time of the widespread flooding around Bangkok that broke out several years ago; by the support of the network, most companies did not withdraw from Thailand. It is thought that the network between companies deepened. In other words, following accumulation of direct investment over a quarter of a century, the industrial cluster (the industrial districts) formed in the Bangkok-wide area.

2. Effects of the industrial cluster function

(1) Reorganization and concentration of production

In Thailand and other ASEAN countries, significant direct investment by foreign firms has been carried out. In such movements, reorganization and concentration of production was often pushed. As preconditions for reorganization and concentration there are the following: ①It can absorb the increase in distribution costs with reorganization, ②Investment is of a nature that satisfies the government of every country, ③there is industrial agglomeration which can reap the benefits of economies of scale and economies of scope, ④contributing to hedging the country's risk. A key reason to carry out reorganization and concentration is to pursue economies of scale. Such an expansion illuminates the lock-in phenomenon whereby corporate realignment brings reinforcement of the industrial agglomeration function as a result, and stimulates further direct investment. The lock-in phenomenon is a key driver of industrial cluster function.

(2) Regional innovation function in the industrial cluster

An industrial cluster is defined in terms of a situation that in a specific field, entities such as companies mutually connect with each other concomitant with geographical concentration so that each company and organization becomes part of a network with relationships in terms of competition and cooperation (Harvard U, Michael E. Porter). In the synergy between cooperation and maintenance of competition, the industrial cluster shows an innovation function. Intense competition between

many companies contributes to the activation of the innovation function to bring about development of new products and know-how as well as cut costs and imitation. This innovation function is called competitive advantage. The important insight of Porter has been to show that successful competitive advantages are a function of four competitiveness-enhancing elements (diamond of competitive advantage).

The first component is demand conditions. A stable demand from local markets encourages the exploitation of economies of scale. However, more importantly the existence of local customers is necessary, who exhibit the necessary levels of demand. Strong pressures from a dynamic and sophisticated home market urge regional companies to ensure that they are innovative and quick to respond to changes in the market. The second component is the presence of various factor conditions. Natural resources, human resources, capital and infrastructure facilities, information, technology are included in this element. This element is broader than the Heckscher–Ohlin model, which mainly pays attention to land, labor, and capital. In addition, quality and the specialty of the element are required in the diamond of competitive advantage. The third concept is firm strategy and rivalry. Intense competition in the local market is necessary for the growth of the industrial cluster rather than reductions in cost. Therein, differentiation becomes important to ensure survivability. Competition turns from imitation into innovation and investment in intangible assets such as skills or techniques increases. The fourth element is related and supporting industries. When a company supplies raw materials and components, the transaction costs for a local cluster participant are lower than those associated with participants in remote places. In terms of business with local companies that deliver apparatus, it is relatively easy to receive support services such as configuration and repair, as well as training. Competitive advantage is achieved through interaction between four essential elements. These four elements mutually reinforce one another and generate a situation of cumulative causation.

Regarding the innovation function in the industrial cluster, local knowledge accumulation is an important element. A variety of cooperation and competition states encourage switching of the existing knowledge and information that is accumulated in the area. This switching action enhances added value, and produces new innovation and creation of further knowledge. Such an innovation function of the industrial cluster is explained in terms of both Collective learning processes (A) and Regional mechanisms for innovation (B).

Collective learning processes (A) refer to the creation of a knowledge base by companies, which constitutes the development of a regional production system. As for the creation of the knowledge base, because of the promotion of cooperation, the solution to a common problem between companies may become an opportunity. Keeble, Wilkinson point out that Collective learning processes (A) consist of the following three elements: ①Flow of highly expert workers in the local labor market, and ②Spin-off from existing companies, universities, and public research organizations, and ③Formulation

of non-formal networks between medium and small-sized businesses. As these three elements, collective learning via local, shared tacit knowledge occurs. As collective learning becomes active in that area, a knowledge base is created and developed.

Next, Regional mechanisms for innovation (B) points at the process when tacit knowledge is converted into formal knowledge in the area⁹⁾. The basic conversion process depends on the Nonaka, Takeuchi model. The model of Nonaka, Takeuchi is a conversion process considered about the activity of the big company. The conversion process is applied to knowledge creation at the regional level. For innovation to become active in the area, it is necessary that local actors such as companies, universities, research organizations, and industrial support organizations circulate knowledge and know-how mutually through flexible networks. The metaphorical wall that isolates organizations from their external environment becomes lower, and fusion and creation of knowledge become increasingly more smooth.

As accumulation and conversion of knowledge and information become active at the regional level, companies in the area come to recognize the need of letting innovation continue; this is very important to a cluster strategy.

(3) Relationship dynamics and industrial districts

In industrial districts a large number of companies which belongs to industrial type concerned are located in a specific area. The characteristics of industrial districts vary by area and type of industry. Markusen classifies industrial districts as follows, ①Marshal type (local industry model, great city inside model <Machine, metalwork industry>), ②Hub-and-spoke type (business corporate town model <A big company leads many local companies as a hub in a specific area>), ③Satellite platform type (A new industrial complex where branch plants are located). Focusing on the satellite platform type, cooperation between companies (branch plants) is little and network formation is weak; industrial agglomeration of the satellite platform type does not often have the function of an industrial cluster. Park described that with industrial districts of the satellite platform type, as an activity period increases, the nature and extent of interactions and networks change and develop sequentially. Regarding the location choice of the company, adhesiveness to the area increases. That is to say, industrial districts change from a satellite platform type to a hub-and-spoke type or Marshal type.

As for the formation of industrial districts in Thailand, the satellite platform type predominated initially. With the passage of time, network supply chains have been structured between major manufacturers and their small and medium-sized counterparts. Furthermore, the fixity of industrial activity increased, and the degree of industrial agglomeration deepened. In such a transformation, industrial agglomeration has changed from a satellite platform type to a hub-and-spoke type. The base formation advances with not only the role of production but also the roles of innovation including

the improvement of production processes, strengthening of hub-and-spoke type features. On the other hand, due to constraints like rising labor costs, new movements such as “Thailand + 1” occur, and rebuilding of the supply chain network is required.

3. Characteristic industrial clusters of Japanese-affiliated companies

(1) Summary of the survey of Japanese-affiliated companies in Thailand

We carried out a questionnaire survey concerning industrial accumulation of Japanese-affiliated companies in Thailand. The headline results from this survey are as follows.

○Regional business characteristics (customers and suppliers)

- Near-range business is carried out actively.
- Regarding elements bringing competitive advantage posited by Porter, competition and pressure as well as harmony and cooperation exist in the connections between companies (customer · supplier · competitor) in close proximity. Following Porter’s indication, we evaluated the positives that competition and pressure bring.
- Focusing on connections with competitors, there was a strong negative evaluation to the statement that “Competitors are sparse in the neighborhood.” In terms of connections with customers, there was strong support for the statements that “To engage in face-to-face business dialogue is possible” and “It is easy to continue doing business.” These items represent harmony. Likewise, there was high affirmation for items that represent competition and pressure: “Demand standard is high (about quality and delivery)” and “Demand standard is high (about new products).”

○By location, evaluation of elements bringing competitive advantage

- Industrial clustering is stronger in the Bangkok-wide area. More specifically, this applies particularly to Bangkok and the outskirts and less so to the suburbs of Bangkok.
- Particularly, in a major company (more than 300 employees), there tend to be positive evaluations of the benefits of industrial clusters. The corollary of this is that small and medium-sized enterprises (SMEs) do not reap the benefits of industrial clustering to the same extent.

○Efforts to maintain operations

- Focusing on current operational problems, items concerning human resources, which is an element of Factor Conditions (business environment) are the most pronounced, i.e., “Securing high quality workers” and “Rise in labor costs.” Moving on, items concerning the Context for Firm Strategy and Rivalry/Demand conditions (viewpoint for customers) are also higher, i.e., “Intensification of Competition” and “Securing customers/clients.” Items concerning business

- desires -“Increases in demand standard (about cost), (about quality and delivery)” are higher, too.
- About efforts to maintain operations, companies have to survive in the context of fierce competition. To facilitate this, increasing workers' skills is critical according to our results. The need to secure and nurture human resources is pointed out by many companies.
 - For contemporary problems about demand noted above, such as “Development of new customers/clients” is the second highest mitigation option. Securing and reclamation of demand contribute to the source of maintenance of the vitality.
 - To maintain operations given intensive competition, current efforts include not only cost cutting exercises such as “Reduction of fixed costs including labor cost,” but also innovative responses such as “Handling expansion of new products and services,” “Improvement of production processes,” and “Introduction of new techniques, know-how.” Following the 2008 global financial crisis, to maintain operations, companies laid emphasis on cost cutting, but currently more emphasis is placed on innovative responses.

○Implementation details

- Period of implementation: January, 2017
- Scope of the survey: Japanese-affiliated companies located in Thailand, listed in the Toyo Keizai Shinposha “foreign company conspectus”
- Data collection method: Mail (Sent from and received at Chiang Mai University)
- Surveys sent: 1,935; Surveys collected: 263; Response rate: 13.6%

Chapter III Optimizing industrial clusters in Thailand

In terms of the production base in Thailand, foreign companies are increasingly transferring the development function from their own country, and thus strengthening it. In addition, the local unification supervising function for ASEAN is strengthened too. Following are some examples in the auto industry, Toyota Motor Co., Nissan Motor Co., strengthen the development function of ASEAN, mainly in Thailand. In addition, Mitsubishi Motors Co., aims at giving the Thai subsidiary a function that is equal to the Japanese head office including development and quality control responsibilities. Our survey results suggest that in the Thai industrial cluster, there is the possibility to stimulate innovation with competition coexisting with cooperation. Further, in the presence of intense competition, as well as cost reductions, there are many actions to bring differentiation, such as handling of new products, improvements in production processes. However, the following actions are important so that the cluster maintains vitality and demand as well as secures and nurtures human resources, supporting manufacturers, and other relevant users and stakeholders.

1. Diversification in exports from Thai industrial cluster

The economic growth of Cambodia, Laos, and Myanmar that are adjacent to Thailand contributes to the extension of the supply chain of the Thai production base. One method to raise the competitiveness of the supply chains in the context of Thai industrial districts is to stimulate network formation between countries such as “Thailand + 1.” “Thailand + 1 (plus one)” is a popular name used by Japanese-affiliated companies and refers to transferring labor-intensive production processes to emerging countries neighboring Thailand: Cambodia, Laos, and Myanmar (CLM) while maintaining a main production base (mother factory) in Thailand. Each mother factory sends raw materials and parts that are necessary for production to CLM. After labor-intensive processing in CLM, the mother factory in Thailand collects outputs from CLM and assembles finished products. By incorporating CLM in the supply chain and achieving cost reductions, the Thai production base is able to maintain competitiveness.

As for dispersing parts of the production process to other areas, the deterioration of investment environments in the mother factory, such as human resources issues (increasing labor costs, shortage of talented workers), becomes an important motive. The preconditions for dispersing production processes are as follows: ①the difference in labor costs is substantial, ②the transportation costs and transaction costs are sufficiently low, ③securing a system that can maintain quality and technical standards, and ④ there is enough investment favor.

In terms of transportation costs and transaction costs②, the progress of constructing infrastructure in southern economic corridors linking Thailand, Cambodia, and Vietnam contributes to expanding a manufacturing industry supply chain led by the Thai industry agglomeration. But there are many problems that should be addressed such as cross-border costs, distance, and securing human resources for “Thailand + 1.” In future, with the progress of communication networks and simplification of customs procedures in addition to expansion of infrastructure including roads and harbors, reductions in transportation costs and shortening of transportation time is anticipated. Further, it is hoped that the Thai production base develops as a place designing and producing strategic products for not only southern economic corridors and ASEAN countries, but also for emerging and developing country markets such as key African markets.

2. Functional enhancement of innovation in industrial cluster

(1) Stimulating interactions

New knowledge is created through interactions between local actors based on principles of competition and cooperation. In the Thai industry districts, relevant actors already exist. So, promotion of interactions among human resources increases the potential for activating and creating new knowledge. Therefore, it is one of the measures that several enterprises have set together to enable

opportunities to increase interchange and bring human resources outside of the individual company (platform). The platform of human resources development supplies talented people who return knowledge to each company and contribute to the cultivation of local overall talented human resources.

Furthermore, when mutual dependence between local actors deepens in the industrial cluster, the interaction of personnel belonging to each organization becomes increasingly important as a mechanism to raise productivity and develop talent.

(2) Supporting development functions

In Thailand, for providing products suited to the needs of the local market, the reinforcement of the development function by major foreign-affiliated firms has been pushed forward. However, to realize effectively the development of major firms, it is indispensable for supporting industries that supply parts to follow the development of the major manufacturers. Most of these supporting manufacturers are SMEs. In Japan, SMEs greatly contribute to the reinforcement of the innovation function of the industrial cluster. The securing of development capability of the whole cluster, including SMEs, becomes the base from which next-generation industries, such as robotics, can develop, evolve, and thrive.

In comparison to large enterprises, it can be difficult for SMEs to push forward development capability such as staff placements, system investment, capital investment. Therefore, to enhance the development function of the Thai industry cluster, it is necessary to offer support to strengthen the development talent of SMEs. Our survey results suggest that SMEs do not reap the benefits associated with industrial clusters to a great extent.

With limited managerial resources, SMEs must cope with various duties such as the securing of human resource and the winning of business partners. If support functions to reduce the burden of these duties are provided, it is possible to allocate managerial resources to development duties. About the support of SMEs, there are methods that the operator of the industrial park expands even further the business that supports a variety of duties in a lump³⁾.

Conclusions

The reinforcement of the development function in the industry cluster including SMEs in Thailand will raise the role and potential of Thailand's role as a production base for not only developed countries markets but also ASEAN markets. For securing of markets of these ASEAN countries, it is indispensable to strengthen the development function that can flexibly and speedily cope with a change in market needs, in approaching the market. The Thai industry cluster has attracted ASEAN industries and it is important to further enhance the production function and the development

function thereof, finally putting an ASEAN Single Market on the agenda. Furthermore, the activation of the innovation function originating from the industry cluster brings forth global human resources and capital to Thailand and promotes the effective utilization of domestic resources. It is hoped that such a movement leads to the formation, nurturing, and growth of next generation industries such as the robotics and aviation industries.

Notes

- 1) The Thai government shows "Thailand 4.0" as the economic social vision which Thailand should aim at in the long term.
- 2) In the knowledge that each individual has, there is the part expressed by words and the part which does not become the words. The individual has tacit knowledge based on experience and the perception in the state that the knowledge does not become the words.
- 3) In terms of support service functions for SMEs the construction of information systems is an important consideration. When the company providing the foreign capital strengthens their development function in Thailand, the need to smoothly adjust between the foreign company's country side and the Thailand field side becomes higher.

References

- The ASEAN Secretariat and the United Nations Conference on Trade and Development (UNCTAD) : "ASEAN Investment Report 2016 Foreign Direct Investment and MSME Linkages". Association of Southeast Asian Nations, 2016.
- Hisao Kasuga: "ASEAN shift of the Japanese-affiliated company". Bunshindo Publishing Corporation, 2014.
- Eiki Yasunaga and Yuki Taketani: "Economic corridors of Mekong area". The Japan Economic Research Institute (JERI), 2014.
- Keiichiro Oizumi: "The potential of the Thailand-Plus-One business model". RIM Pacific Business and Industries Vol. XIII, No. 50, 2013.
- Tuneta Nagai: "ARC Report (Thailand)".ARC, 2013.
- Roel Rutten: "Knowledge and innovation in regional Industry". Routledge, Taylor & Francis Group, 2003.
- Masahisa Fujita and Jacques-François Thisse: "Does geographical agglomeration foster economic growth? And who gains and loses from it?". The Japanese Economic Review Vol. 54, No. 2, Japanese Economic Association, 2003.
- Harald Bathelt and Johannes Gluckler: "Toward a relational economic geography". Journal of Economic Geography Vol. 3, No. 2, 2003.
- David Keeble and Frank Wilkinson: "Collective learning and knowledge development in the evolution of regional clusters of high technology SMEs in Europe". Regional Studies Vol. 33, No. 4, 1999.
- Lee Markusen and DiGiovanna: "Second tier cities-rapid growth beyond the metropolis". University of Minnesota Press, 1999.
- Michael E. Porter: "On competition". Harvard Business School Press, 1998.
- Sam Ock Park: "Networks and embeddedness in the dynamic types of new industrial districts". Progress in Human Geography Vol. 20. No. 4, 1996.
- Allen J. Scott: "Metropolis from the division of labor to urban form". The University of California Press, 1988.

keyword : Industrial Districts, Innovation, Thailand, Cluster, Competitive Advantage