EXECUTIVE SUMMARY

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1. INTENSION AND AIM

The formation and strengthening of industrial bases are one of the conditions for developing countries to achieve economic development and poverty reduction. But even after virtuous cycles for industrial agglomeration are provoked in an industrial region, the region can face serious cost competitions with other regions with ample low-wage labors. To remain in the competition, it is necessary for the region to seize fully the prospected benefits from the on-going regional integration and to upgrade its industrial structure to an innovative industrial cluster where companies conduct a range of research and development (R&D) activities, or collaborate to transfer knowledge and technologies. Nevertheless, mechanisms of forming and upgrading industrial clusters and networking them have not necessarily been empirically examined enough.

The objectives of the research project are to conduct comprehensive studies on: current conditions of industrial agglomerations; impacts of the regional economic integration on industrial organizations in Asia; the characteristics of the existing production networks of industrial agglomerations; and industrial policies including foreign direct investment (FDI) promotion and science and technology (S&T) development.

The research project, in the initial phase, explored policy measures to facilitate industrial developments and establish complementary relations between industrial agglomerations in ASEAN and East Asia. In other words, the main focus of the project was on prioritizing policy measures for industrial clustering to suggest practical strategies for developing industrial clusters, taking into account industrial development stages and types of industry, and in the light of the on-going regional trade and investment liberalization initiatives as well as the accelerating pace of production

networking.

2. RESEACH METHODS

Research activities of the project are largely twofold: case study and mail survey. Case studies are based on fact finding from literature surveys, official reports and statistics, and in-depth interviews with companies and organizations related to industrial and trade promotion. Mail surveys are aimed at collecting primary data information not found in existing statistics but indispensable for distinguishing the key drivers that significantly contributing to industrial agglomeration, upgrading and innovation from various potentially influential factors by applying econometric methods.

The questionnaire was designed as simple as possible to make it user-friendly. Single and multiple-choice questions were posed to the respondents, facilitating them to fill up with ease, so as to increase the number of valid responses. But this simplification enables only to sketch out the current situation of industrial development, and to identify factors that influence investment decisions of companies and policies executed by governments. The case study component complements the mail survey with additional insights.

Mail surveys were organized in major industrial areas in the following five ASEAN countries: Indonesia, Malaysia, the Philippines, Thailand and Vietnam. A standardized questionnaire was used in all these countries except the Philippines where some modifications were made to suit local conditions. Econometric methods were applied to individual data and pooled data composed of all countries, except in the case of Malaysia where sufficient number of valid responses could not be collected. Nevertheless, rigorous comparative studies could be done based on common analytical approaches. In addition, case studies were conducted in Cambodia, China, India, South Korea and Singapore, based on secondary data and face-to-face interviews.

The results of these studies were taken fully into account in identifying factors that promote the formation and development of industrial clusters and to derive policy implications.

3. FINDINGS AND CONCLUSIONS

There are well-established and emerging industrial clusters in ASEAN and East Asia. These clusters consist of various types of industries such as traditional artisanal, labor-intensive manufacturing, and knowledge-intensive service sectors. Their developments are based on a mixture of local, national and international factors promoting industrial agglomeration and clustering. In addition, the development of clusters in the region influences one another as the result of the economic integration that facilitates trades and investments, and intensifies competition among firms and industrial areas. These phenomena are reinforced by technological as well as managerial changes such as "modulization" and "fragmentation" observed typically in the automobile and electronic sectors.

3.1. Factors Encouraging Industrial Clustering Observed from Case Studies

Although various factors are associated with clustering, conducive business environment is a fundamental prerequisite for triggering industrial agglomeration, because agglomeration and clustering are driven by the private sector and market forces with appropriate supports of the public sector which include both national and local conditions that influence decisions on investments by local entrepreneurs and foreign investors.

At the country level, **stable macroeconomic environment and government institutional infrastructure**, including the **legal system,** are indispensable for industrial agglomeration. These influence entrepreneurship in local companies by reducing costs of financing, opening new operations, collaboration with other firms, and access to cutting-edge technologies, information and know-how. These also affect choices of country hosting FDIs by multinational companies (MNCs).

Local conditions have larger influences on companies' decision-making on choosing specific locations. **Infrastructure** including roads, ports and utilities and **size of local markets** are notably important. The existence of **supporting industries** including suppliers of raw materials and parts, banking, legal consulting, and other business services that support business developments are crucial, since these

developments are related to infrastructure and local markets mentioned above. The establishment of MNCs' production bases contributes to the expansion of local markets.

Liberal trade policies and **investment incentives** have been the key policy instruments enticing the MNCs, which provide the driving force for industrial development. Liberal trade policies are essential to overcome constraints such as limited size of local markets and weakness of supporting industries. Investment incentives focus not only on MNCs but also on local companies to promote the development of SMEs and supporting industries. These policies are needed to introduce, modify, and restructure in a "timely" way, in accordance with stages of industrial development and the degree of market competition.

All countries and local governments do not necessarily develop capabilities to meet all of the conditions and introduce policies mentioned above. The policy to develop industrial zones and special economic zones (EPZs) by targeting specific geographic areas is cost-effective to economies under severe fiscal and institutional constraints.

3.2. Obstacles to Industrial Clustering Observed from Case Studies

Main obstacles to industrial clustering found from the most of the surveyed countries are largely related to upgrading existing industries in the surveyed regions in comparison with the result of successful industrial development. The shortage of low-cost labor is typical. More serious problems are the shortage of skilled labor and professionals that hinder industrial upgrading and innovations. Another constraint is the lack of upgrading physical and institutional infrastructure such as road, customs procedures, intellectual property rights, legal systems and legislations, in the absence of which it will be difficult to raise value-added of products and to improve logistics, production methods, and innovative activities.

Coordination failures are one of the most serious key policy issues differentiating the performance of industrial cluster policies. An issue related to this is missing linkages between firms, business associations, public and private research and development institutes, universities, and national as well as local governments. The roles of local governments, business organizations, or key persons in regions are also crucial for success in organizing public-private partnerships to unify all local initiatives into clustering.

For less developed countries, clustering is a new concept, and is not sufficiently reflected in regional and national policies in these countries, which result in insufficient linkages among related parties.

3.3. Factors Promoting Industrial Agglomerations Verified by Econometric Analyses

Econometric methods were applied to data collected by mail surveys. To summarize the findings from the econometric analyses, the results of the estimations based on the pooled data are presented in what follows.

According to the results of the estimations, at the beginning of industrial agglomeration, companies started which production is labor-intensive, aiming at local markets rather in the closed economy. As mentioned in the case studies, factors such as institutional infrastructure and proximity to suppliers/subcontractors are important for the first movers to the surveyed areas. As ASEAN economies became increasingly open, firms tended to be more export-oriented, facing serious cost competitions. Consequently, factors such as low-cost labor, and the protection of intellectual property rights (IPR) emerged important for firms (latecomer) to open offices there, as they became more and more capital intensive, with business activity shifting to the production of components and parts.

Although investment incentives, liberal trade policies, and variables related infrastructures are not statistically significant, the coefficients on these variables do suggest that investment incentives are important for first movers, while liberal trade policy are essential for latecomers. In addition, first movers seem to attach importance to physical infrastructure including roads and ports, while latecomers seem to be more concerned with utilities and telecommunications infrastructure. These imply that it is necessary to shift policy in accordance with the stage of industrial development.

3.4. Factors Promoting Industrial Upgrading Verified by Econometric Analyses

To verify factors promoting industrial upgrading, we developed econometric models with four types of upgrading carried out by respondents in last three years, which are selected as a dependent variable (Y). The independent variables (Xs) include characteristics of firms and levels of “satisfaction” with 20 factors that were the same as

the above-mentioned models of industrial agglomeration. We categorized upgrading into the following four types: (a) introduction of a new good; (b) adoption of a new method of production; (c) opening of a new market; and (d) acquisition of new supply of inputs.

In order to strengthen the analysis of industrial upgrading, we developed another model of upgrading that includes **"D-score" analysis**. D-score is defined as a simple difference between "importance" and "satisfaction" attached to each of the 20 factors. Larger D-score for a specific business condition implies more dissatisfaction with it.

A key finding from the D-score models is that legal system has negative impacts on most of the innovation types carried out by MNCs. It is difficult, however, to identify a common factor which is applicable for four types of upgrading. For example, estimated signs of the coefficients in the econometric model that includes the level of satisfactions with respect to 20 factors as independent variable suggest that promoting factors depend on the type of upgrading. As for the introduction of a new good, **liberal trade policy** is an encouraging factor, while **utilities** and **access to export markets** discouraging.

3.5. Source of New Technologies and Information Verified by Econometric Analyses

From the analyses on the sources of new technologies and information based on the D-score model, MNCs tend to be transferred technologies from other MNCs and have less technical cooperation or assistance from local governments in comparison with local companies. MNCs which are not satisfied with local financial system tend to receive technical assistance from foreign agencies including official development assistance (ODA). But those who have problems with physical infrastructure tend to depend on technical cooperation or assistance from local business organizations which are familiar with local situations.

On the other hand, local firms that face problems with infrastructure and financial system acquire technologies and information through technical assistance from foreign agencies. But well-designed government institutional infrastructure is an important factor for non-MNCs to encourage firms to receive technical assistances from foreign agencies. Technical cooperation or assistance from local universities, or R&D institutes is also important for firms unsatisfied with financial system.

These findings partly reflect the present situation, with MNCs and non-MNCs having different networks to obtain new technologies and information. In other words, MNCs are carefully observing capabilities of local firms in deciding whether or not to establish closer linkages with local firms.

3.6. Implications from Econometric Analyses

Clustering policies should be determined according to policy priorities and adjusted them timely to business environments. Even though there are no standardized policy packages applicable to all stages of industrial development and all types of innovation, it is imperative to promote interactions among businesses, universities, local governments, other public authorities and other organizations which seek full benefits from clustering.

But above-mentioned networks, particularly between MNCs and local firms, do not necessarily exist at the beginning, although they represent the key channel of technology diffusion in developing countries. Local firms and business associations are required to consolidate their footholds for absorbing new technologies with the support of local and central governments.

Governments are required to harmonize all local efforts for improving the quality of infrastructure, human resources, and institutional frameworks. Developing these R&D capabilities is considered as "public goods" which contribute not only to industrial agglomeration but also to knowledge and technology transfers and innovations.

4. POLICY IMPLICATIONS AND RECOMMENDATIONS

As countries begin to industrialize, there is a tendency for industries to concentrate initially in areas where physical infrastructure is readily available and subsequently for related industries to gravitate closer together, thereby taking advantage of inherent synergies. In the process, industry clusters are formed, with each geographical area specializing in certain activities, leading to spatial diffusion of industries. This is the case not only for early movers like Malaysia and Thailand but also for the latecomers like Cambodia and Vietnam. It is important to underscore that this process is essentially

a private-sector phenomenon, driven by market forces and aided by government support.

As industrial agglomeration and clustering contribute significantly to economic growth and development through increased competitiveness, there is certainly a case for policies that promote cluster formations. The current focus on physical infrastructure and logistics, liberal trade and investment regimes, economic reforms aimed at privatization and deregulations, practiced in many countries in the region, must continue with increased vigor. The small and medium enterprises, which play an important role as ancillary industries, need much help, as they are best with problems of sorts, ranging from lack of market information, bank credit and technical know-how, to acute shortage of skilled manpower. The local SMEs are heavily dependent on domestic markets, showing no or little interest in exporting. All this calls for policy initiatives at the national level that would provide easier access to factors of production, raw materials, market information and other inputs that would help reduce the cost of doing business for these firms.

Regional initiatives can complement national initiatives in alleviating some of the problems faced by industrial clusters especially in the emerging economies. It is in this spirit that the following three concrete proposals are put forward.

The first proposal is to establish East Asian Centers for Standards and Testing for a number of key industries (e.g. electronics, automobiles, machinery, furniture, footwear). This will facilitate harmonization of standards, in addition to certification of standards for all market destinations. The centralized facility for a given industry catering to the whole region will reduce cost, thanks to economies of scale and scope. This will also enable products to move more freely within the region once the standards are tested and certified. This will lead to greater intra-regional specialization and increased intra-industry trade flows, with more and more inputs being sourced externally, which would render the region's industrial products internationally competitive.

The second proposal relates to the establishment of East Asian Resource Centers for selected industries, which will serve not only as a repository of information relating to the focus industry, but also as "intelligence centers" that would gather and disseminate vital information to all the stakeholders and as "alert centers" that would draw the attention of the industry players to new threats, challenges and opportunities. Events,

policies, technologies, pronouncements and initiatives in the major markets that would impinge upon the industry will be analyzed by the Resource Center and disseminated quickly for the industry and the relevant ministry to act upon. The timely flow of pertinent information is crucial for strategic planning at the firm level and policy adjustments at the ministry level.

The third proposal calls for the formation of East Asia-wide Industry Clubs for the major industries. These industry associations would enable firms to interact and network with one another and act as lobby groups to influence national, regional and global policies that would impact on the industry interests. The industry clubs can also help the members overcome the problem of acute shortage of skilled workers by promoting skill development. Instead of setting up "regional" technical training facilities to meet the industry needs, it would be cost-effective to make use of existing facilities in the region through mutual accreditation and recognition. The industry clubs can help identify the various training facilities and training programs available in the region. In addition, the industry clubs can mount schemes that would enable its members to send their technicians for hands-on training experience in the work place of other member firms.

East Asia-wide Industry Clubs are likely to work well, as it provides the "critical mass", given the extensive regional production network in the EAS region, especially if the EAS can provide an avenue for their concerns and views to be heard by policy makers.

The above three proposals are doable. As the first two proposal would entail large investments, it is suggested that they are financed on a PPP (private-public partnership) basis with both industry and government contributions. The third proposal is envisaged as an entirely private sector affair, albeit recognized and endorsed by the East Asian governments. The latter may help set up such associations, with commercial attaches in embassies playing initially a catalytic and subsequently a facilitating role.