

1. Introduction

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1.1 ECONOMIC TRANSFORMATION IN EAST ASIA

The world economies have been suffering from a great recession caused by the so-called Lehman Shock, which is being referred to as a recession that occurs only once in a hundred years. The resulting financial disorder triggered an economic crisis in the EU. In this situation, although OECD member countries are still struggling to dispel the confusion, developing economies in East Asia, such as the ASEAN (Association of South East Asian Nations), and notably China and India, have already recovered and have been leading the recovery of the global economies. In particular, the Chinese economy has now become the second largest in terms of GDP after the US and can no longer be referred to as a developing economy. These facts have proven the truth of the decoupling theory; developing countries tend to play a more important role in the global economy than developed economies.

One of the success factors of East Asian economic growth lies in the agglomeration of firms in the region, now termed the 'Factory of the World'. MNCs (multinational corporations) have been establishing factories or branch headquarters in this area since the mid-1980s in order to take full advantage of the relatively cheap human and natural resources such as labor, land, and raw materials. MNCs combined these native resources with their technologies, which included business management as well as engineering. This initiated a 'Big Bang' of growth in the area.

In addition to economic development in terms of the size of economies, some qualitative transformations have come to be observed in East Asian economies. First, some economies have reached the stage of mass consumption. Due to economic growth, consumers can now afford to purchase all kinds of consumer goods such as electric appliances, automobiles, and telecommunication tools such as cellular phones. Millions of eager consumers with abundant purchasing power constitute the so-called 'volume zone', now being targeted by MNCs. This huge demand is one factor promoting economic recovery after the Lehman Shock. MNCs

once considered East Asia as a production or export base, but now view the region in terms of promising markets for their products.

Second, China and Thailand have been shifting their stance from being recipients of FDI (foreign direct investment) to becoming donors or investors, that is, they have begun to purchase Japanese and US SMEs (small- and medium-sized enterprises) with specific technologies and know-how. The former is actively engaging in investment in resource-related firms all over the world. Needless to say, the above phenomena are not the same in all East Asian economies; China takes the lead, other ASEAN economies follow, and Myanmar and Cambodia bring up the rear. This appears to be a new 'flying geese' model of Asian economic development.

1.2 TRANSFORMATION OF EAST ASIAN CLUSTERS

In accordance with the above structural shifts in the East Asian economies, industrial clusters in this area have also been experiencing changes. These can be summarized as follows. Some industrial clusters in East Asia have been shifting to a higher stage than being simple production bases. In other words, economic growth and agglomeration helped the area proceed from quantity-oriented to quality-oriented development. This is the second development process (the first being that of the formation of production bases), which is considered to consist of the following two dimensions: (1) upgrading and (2) innovation. The former is characterized by the following examples: from being subcontractors for simple work to producing intermediate goods; from producing intermediate goods to producing final products; and from simple to complex or precision work. This represents a transformation from labor-intensive to more capital-intensive industries such as high technology. The latter dimension is viewed as a transformation from production-based to knowledge-based economies. Clusters in the coastal provinces in China, for example, transformed themselves into high-technology, innovative clusters in which R&D activities have become increasingly reinforced. Bangkok, Thailand is another case. Toyota Motor Corporation has established its third R&D center after Japan and the US, and electronics and PC firms have also established R&D institutions in the area.

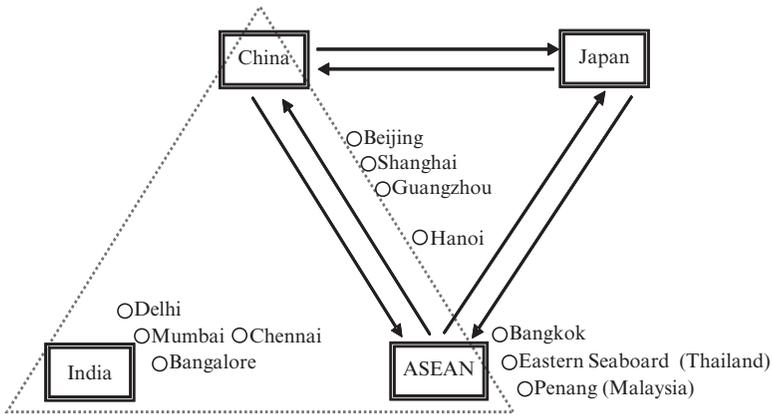
Economic development and agglomeration in East Asia have created a new and ever-increasing interdependency in this area, and this is due to the strategies of MNCs and local firms seeking the economic efficiency of the reallocation of functions and roles of each factory, since the areas in which their factories and offices are located are endowed with differ-

ent advantages due to the stage of development as well as the resources existing in the area. This is not a simple reallocation, but a new division of labor, termed 'fragmentation', which restructures production processes into several blocks and reallocates them to suitable clusters. Firms make decisions concerning the locations of their business establishments on the relative advantages of different regions, and the flows of products as well as parts and components, human resources, funds and information increase as a result. The trade ratio within East Asia has increased from 33.4 percent to 54.2 percent in the 20 years from the 1980s, and this ratio is followed by the EU and is also larger than the NAFTA (North American Free Trade Agreement) countries (METI, 2005).

The above transformations in a sense occur endogenously, while at the same time there are other changes due to exogenous factors. One of these is due to WTO (World Trade Organization) regulations, which have prohibited the various preferential subsidies offered to MNCs and other firms in order to invite them to invest in a particular economy. This appears to limit the effectiveness of policy aiming at further clustering. Another factor is FTAs (Free Trade Agreements), whose objective is to eliminate import duties on all products and to promote trade among the participating economies. In East Asia, the ASEAN Free Trade Area (AFTA) covers economies such as the ASEAN-6 (Brunei, Indonesia, Malaysia, the Philippines, Singapore, and Thailand) and the new member countries such as Cambodia, Laos, Myanmar, and Vietnam.

FTAs are expected to promote regional integration, the merits of which are summarized as follows: (1) through the enlarged market, firms can better exploit and benefit from economies of scale and better utilization of resources; (2) the cost of trade may be reduced by the elimination of trade barriers such as customs clearance and reducing transportation costs by finding more economical routes; (3) the potential for the coordination of economic policies may be exploited, resulting in an increase of their effectiveness; (4) competition in internal markets may be increased, resulting in a downward pressure on domestic prices; and (5) more opportunities for a wider range of goods and services to consumers may be provided, resulting in an improvement in individuals' utility. In addition to these, regional integration facilitates exchanges of technical information, and the resulting competition forces firms to implement new ideas and technologies (Jovanovic, 2005). Although the rate of FTA utilization remains currently at a fairly low level in comparison with NAFTA, it is expected that FTAs will bring about a shift in economic activities in the long run.

Thus, industrial clusters of East Asia transform themselves in the face of endogenous as well as exogenous pressures. Figure 1.1 shows one example of such a transformation, which indicates that the traditional triangle



Source: Authors.

Figure 1.1 The Asian triangle

connecting developed economies (Japan), China, and the ASEAN has become a new triangle formed by East Asia and India.

1.3 EVOLUTION OF THE FLOWCHART APPROACH

A series of papers and books (Kuchiki, 2003; Kuchiki and Tsuji, 2005, 2008, 2009) have attempted to hypothesize the process of economic development in East Asia in terms of the 'flowchart approach', which represents the requirements of industrial clustering. The flowchart approach also posits that industrial cluster policy can be effective in forming industrial clusters. The essence of the flowchart approach in the context of industrial cluster policy lies in two basic guidelines: (1) the prioritization and timing of policy measures and (2) the specification of economic agents who are responsible for and take the leadership in formulating the necessary policies for capacity building. The flowchart approach has evolved with the transformation of the East Asian economies, and two models are presented below.

1.3.1 Flowchart Approach: Mark I

The first approach (Kuchiki and Tsuji, 2005, 2008) vividly describes the clustering process in East Asia as follows: first MNCs, which were referred to as anchor firms, established factories in industrial estates or parks

equipped with infrastructure and facilities, the MNCs then inviting affiliated firms such as parts suppliers and supporting firms to locate nearby. An anchor firm is defined as a firm that manufactures its products by assembling the intermediate goods of parts and components. It has a high value of industrial backward linkage. Followed by the anchor firms, local firms are established in neighboring regions either by native businesspeople or as joint ventures with MNCs. This is the early stage of a cluster, and further processes are required in order for a region to become an industrial cluster, that is, interactions between these entities in the region increase and local firms grow through the acquisition of technologies transferred from MNCs. The area then becomes an industrial cluster. Countless clusters have been born as a result of these processes.

The formation of industrial clusters cannot be achieved by the market mechanism alone; the harmonization of suitable economic policies is also required. The flowchart approach hypothesizes the nature of such practical policies. The core of the suggested policy measures is capacity building for inviting MNCs, which includes constructing and facilitating physical infrastructure; developing social infrastructure such as legislation for free business activities, including tax and intellectual property rights; creating living conditions satisfactory to foreign investors; and developing human resources. Here, capacity is built by improving the investment environment for inviting anchor firms in the manufacturing field.

1.3.2 Flowchart Approach: Mark II

Industrial clusters in East Asia area originated as production bases, but further agglomeration itself created the power to propel the clusters into the second development process. The more firms or factories that agglomerated, the more the flows of information enlarged and enriched. This became the second explosion in the area, in other words, agglomeration helped the area to proceed from quantity-oriented development to quality-oriented development. This is the second development process, which is considered to consist of the following two dimensions: upgrading and innovation. Some clusters had already grown beyond the threshold of the second stage of industrial clusters. The word 'threshold' is used here since we cannot yet confirm that innovation is a driving force for further economic growth. In particular, the power for creating continuous innovation has not yet been formed, while clusters in developed countries, such as Silicon Valley and Boston in the US and Cambridge, UK are examples of innovation clusters.

The theoretical as well as the policy basis of propelling clusters into the innovative stage are examined by Kuchiki and Tsuji (2009). Their

book aimed to identify the factors and policies promoting the upgrading of industrial clusters into the second stage of innovation and discussed the applicability of the flowchart approach in this process, which can be termed the flowchart approach for shifting to an innovation cluster. The key factors for upgrading towards innovative clusters are information transmitting linkages and absorptive capacity of local firms to fully utilize information related to upgrading and innovation. This flowchart approach attempted to identify the transmission channels and mechanism of flows of cutting-edge technology from various sources not only inside but also outside clusters, such as MNCs, universities, local R&D institutions, and local business organizations, to recipients, that is, local firms. Linkages inside a cluster were found to be the source of power for transforming agglomeration to innovation. Thus far in East Asian clusters, the channels transferring information on technologies as well as managerial know-how via MNCs have appeared to be stronger than via local entities such as universities, R&D institutions, business organizations, and other firms inside a cluster. In this sense, the endogenous innovation process is not yet established. In addition, the key policy was identified as the formation of the local platform that fosters flows of information and strengthens various linkages, in particular, the formation of 'local innovation networks'.

1.4 RESEARCH QUESTIONS OF THIS BOOK

While we have been working to establish a general theory that enables us to explain not only agglomeration but also the transformation of clusters toward the upgrading and innovation stage, the reality of the East Asian economies has been drastically shifting and they are now facing entirely new environments, as mentioned earlier. Economic ties among the countries and regions in the area are becoming increasingly stronger, and economic interdependence has created new environments. The analysis of upgrading and innovation is being forced to include these phenomena in its scope. More precisely, the analysis is required to be conducted within a more dynamic framework. The problems of each cluster differ according to the degree of agglomeration or the degree of transition into innovative economies. Accordingly, the different industrial cluster and innovation policies suggested by the flowchart approach are required depending upon the level of transition, and in this dynamic setting the 'timing' and 'sequencing' of policy measures are taken into consideration. The transformation from a production-oriented agglomeration to one oriented towards innovation makes this analysis more complicated and difficult.

In order to conduct research in the new environments, transformations in the regional economies, such as qualitative changes and regional integration, are specifically selected, since these are the most important as well as the most urgent issues in East Asia. These new environments will surely accelerate agglomeration, whose merits firms can exploit. The effect of the new environments is not necessarily limited to scope and speed, but will yield the qualitative shifts of agglomeration and innovation. This book thus attempts to explore how regional transformation brings new insights to the theory of agglomeration and innovation. In addition, industrial cluster policy for agglomeration and innovation will also be reconsidered in a more dynamic and long-term framework. These are the issues this book seeks to clarify.

1.5 SUMMARY AND CONCLUSIONS OF THIS BOOK

This book aims to analyze problems of clusters in transition and chooses various clusters at different stages and in different regions. It consists of the following three parts: Part I contains Chapters 2 to 5, which provide theoretical background and discuss structural changes in environments such as the WTO and FTAs, and their effects on clustering. Part II includes Chapters 6 to 9, which examine clusters in China, Malaysia, and Laos. These chapters discuss how clusters are formed and policy recommendations for upgrading and innovation. The clusters analyzed here include not only those of the Flowchart Approach Mark I, but also those with innovative aspects at the beginning. Part III consists of Chapters 10 and 11, and focuses on the relationship between clustering and innovation. These chapters suggest the direction of future research into the Flowchart Approach Mark II. The purposes and focuses of each chapter may be summarized as follows:

Chapter 2 presents the flowchart approach to industrial cluster policy and compares cluster formation in the Eastern Seaboard region in Thailand in the 1980s with the 1990s. This chapter shows conditions for firms to move to industrial zones in the framework of spatial economics or New Economic Geography under a setup similar to the flowchart approach. The importance of industrial zones and forward and backward linkages were clarified in the formation of industrial clusters. The flowchart approach shows that industrial cluster policy brings industrial agglomeration at the first stage and then innovative activities at the second stage.

Chapter 3 proposes an industrial cluster policy of establishing Export Processing Zones (EPZs) in some cities in CLMV (Cambodia, Laos,

Myanmar and Vietnam) to form industrial clusters. The in-depth interview was used for recommending industrial cluster policy by prioritizing policy measures based on scores of evaluating the investment environments that the flowchart approach suggests.

Chapter 4 reconsiders the definition of EPZ and SEZ (Special Economic Zone). In developing economies, typical traditional EPZs established for export promotion will lose their effectiveness after a certain number of years of joining the WTO. Explaining the WTO Agreement on Subsidies and Countervailing Measures (SCM), the author discusses the expected benefits of EPZs and the operation of industrial zones under the SCM.

Chapter 5 analyzes factors clustering the automotive industry in Thailand and the influences of regional integration on the industry. Since the economic crisis in 1997, the Thai economy has been achieving sustainable economic growth and the automobile industry leads its growth. Now the Thai economy aims at entering the next stage by focusing on regional integration, which induces the restructuring of the strategy of international division of labor in East Asia. This chapter highlights comprehensive policies introduced by the Thai government to cope with the age of regional integration. Whether these policies are successful or not will greatly influence other East Asian economies.

Chapter 6 proposes the establishment of Vientiane Special Economic Zone in Laos in order to solve the unemployment problem. Considering two industrial parks in Laos, Savan-Seno Special Economic Zone and Vientiane Industrial Park, five key factors for the success of the Vientiane SEZ are examined: (1) organization, (2) location with good infrastructure, (3) incentives, (4) availability of labor force, and (5) simple and speedy export and import procedures. In addition, (6) it is definitely a matter of course that the plots of land in the Vientiane SEZ should be provided at a competitive price.

In Chapter 7, the flowchart approach is applied to the development of electronics clusters in Malaysia. There are several conditions, however, for a group of firms to develop into an 'industrial cluster'. For the innovation stage of the cluster, reforms are required by sequencing in the following factors: universities and research institutions, human resources, institutions and national policies, regional policies and innovation infrastructure, urban governance and livability, anchor firms and persons. The most important is the realization of the full benefits of these reforms. Malaysia needs industrial upgrading and the policy measures outlined in this chapter are deepening and upgrading the electronics cluster.

Chapter 8 aims to discuss the role of research institutions and universities in the development and evolution of the high-tech industrial cluster

known as Wuhan ‘Optical Valley’, located in central China. Guided by the flowchart framework, this chapter analyzes the advantages of the local high-tech industrial cluster in the optical manufacturing industry, and explores the interaction between universities and industrial clusters in the capability and resource-building process. In Wuhan Optical Valley, research institutes are mostly related to universities. Therefore, two factors of human resources and anchor persons are identified for the cluster formation there and this chapter concludes that human resources are most important for the innovation process.

Chapter 9 focuses on the interactive process and mechanism between MNCs and industry clusters in China and attempts to answer the following questions: how do MNCs construct the supply chain in industrial clusters; how do MNCs contribute to and receive benefits from industry clusters and regional development through FDI; how do industry clusters contribute to and benefit from MNCs’ FDI; and are there differences and similarities among different MNCs? For this purpose, Chapter 9 selected the automobile industry as a case study.

Chapter 10 focuses on shifts of industrial clusters into the second stage of innovation. It examines Shihwa Industrial Complex, a suburban area located in Gyeonggi Province, South Korea, which faced a difficult situation due to insufficient business resources, such as funds and human resources in order to convert its industrial structure from the mass production type to the knowledge creation type. Chapter 10 examines the effect of technological networks and partnerships on promoting R&D activities of SMEs, using original survey data obtained from firms in the cluster.

Chapter 11 offers an empirical study on the relations between agglomeration and innovation by examining a mail survey of 5000 Japanese innovative SMEs inside and outside a cluster. This chapter verifies the following two hypotheses: (1) that a relationship exists between innovation and industrial clusters formed by regional SMEs; and (2) regarding information flow, that linkages among SMEs and regional R&D institutions exist.

The main conclusions of this book are as follows: the Eastern Seaboard region in Thailand and northern Vietnam experienced the sequencing of policy measures similar to those recommended by the flowchart approach; Wuhan and Shanghai in China, Thailand, northern Vietnam, and Malaysia are positioned at the start of the second stage of clustering, that is, innovation; that most of the agglomerations in East Asia need to sequence policy measures including university–industry linkages, and national innovation systems to proceed to the second stage; the effect of regional integration on industrial clustering is ambiguous, which requires future analysis.

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