

# IDE Research Bulletin

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## **Empirical studies on industrial clusters in the Mekong Countries**

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March 2017

IDE-JETRO

Research Bulletin:  
Empirical studies on industrial clusters in the Mekong Countries

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## ABSTRACT

Traditional industrial policy, which aims to protect domestic industry, has lost its legitimacy due to the influences of globalization and regional economic integration. Against such a background, industrial clusters have attracted increasing attention from policy makers. However, only a few empirical studies have been conducted in the Mekong countries, such as Vietnam. To narrow the knowledge gap, this study will first identify the location of clusters in Vietnam. Then econometric analysis is conducted to investigate the relationship between industrial clusters and the productivity of firms. Furthermore, the study investigates the co-location of clusters and its impact on the productivity of firms. The study also considers a migration-urbanization issue with a particular focus on two mega-cities in Vietnam.

Title of the Project:

Empirical studies on industrial clusters in the Mekong Countries

Period of the Project:

April 2015—March 2017

Members of the research project:

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Background and objective:

Traditional industrial policy, which aims to protect domestic industry, has lost its legitimacy due to the influences of globalization and regional economic integration. Against such a background, industrial clusters have attracted increasing attention from policy makers. However, only a few empirical studies have been conducted in the Mekong countries, such as Vietnam. To narrow the knowledge gap, this study will first identify the location of clusters in Vietnam. Then econometric analysis is conducted to investigate the relationship between industrial clusters and the productivity of firms. Furthermore, the study investigates the co-location of clusters and its impact on the productivity of firms. The study also considers a migration-urbanization issue with a particular focus on two mega-cities in Vietnam.

This study comprises the following three papers:

1. Agglomeration economies in Vietnam: A firm-level analysis

Toshitaka Gokan, Ikuo Kuroiwa, and Kentaro Nakajima

Background of the study

In spite of the large presence of the Vietnamese economy in transition economies, studies of spatial agglomeration in Vietnam are still rare. As an exception, Ercole (2013) investigates agglomeration in Vietnam, finding that a few regions lead the country's rapid economic growth, with economic activity highly concentrated in Ho Chi Minh City. Further, low-tech industries are more agglomerated than the mid-high- and high-tech industries. As another exception, Howard, Newman, and Tarp (2012) identify the

determinants of agglomeration in Vietnam by applying the approach of Ellison, Glaeser, and Kerr (2010). They cannot find determinants of agglomeration robustly, with the identified determinants varying with the choice of the measure of agglomeration.

Ercole's (2013) result that economic activities are agglomerated only in low-tech industries implies that agglomeration economies would not be well formed in Vietnam, especially in mid-high- and high-tech industries. Further, Howard, Newman, and Tarp's (2012) finding that the determinants of agglomeration are not identified robustly may come from the weak agglomeration effects in Vietnam. However, most of the studies on agglomeration in Vietnam focus only on the location patterns of economic activities with the regionally aggregated data, and there is no paper that examines effects of agglomeration on productivity.

Against this backdrop, this paper examines the effects of agglomeration economies on firm-level productivity in Vietnam. By using firm-level data, we can estimate firm-level TFP. We then identify the industrial clusters as a convex combination of contiguous districts as a proxy for agglomeration using the procedure proposed by Mori and Smith (2013). Then, by comparing TFP between cluster and non-cluster, we estimate the agglomeration effects on firm-level productivity. We especially consider the different effects of the agglomeration economies in localization and urbanization. Furthermore, a special characteristic of a transition economy like Vietnam is the large presence of state-owned and foreign-owned firms. This paper also investigates the difference in the strength of agglomeration economies across firm characteristics.

Furthermore, we decompose the channels of agglomeration economies working in the cluster. As Marshall (1920) pointed out, there are three main sources of agglomeration economies: knowledge spillovers, interfirm transaction relationships, and labor pooling. By using inter-industry relationships in each agglomeration effect (e.g., input-output linkage, knowledge transfers, and sharing types of workers), we build indices of each agglomeration effect in the cluster by industry-level, and we decompose each effect.

#### Estimating agglomeration economies

The agglomeration economies can be classified into two types, localization and urbanization economies. Localization economies improve the firm-level productivities through the agglomeration of firms within the industry (e.g., Glaeser, Kallal, Shainkman, and Shleifer, 1992). On the other hand, urbanization economies improve the firm-level productivity through the diversity of industries (e.g., Jacobs, 1969). This

study calculates a variable that represents the effects in both types of agglomeration economies. For the variable for localization economies, we use a dummy variable that is one if the firm  $e$ 's locating district  $r$  is detected as a cluster of industry  $i$  to which the firm  $e$  belongs. This is an indicator variable that indicates whether the firm locates in the cluster of their own industry or not. On the other hand, a variable for urbanization economies should represent the diversity of industries. The cluster detecting methodology enables us to define the degree of urbanization by the number of layers of clusters in different industries in a region. For region  $r$ , we can count the number of industries that have a cluster in the region  $r$ . The number of industries that have a cluster in a region represents the variety of clustered industries in the region, and can be considered as the urbanization index for the region.

## Results

We find the following results. First, localization economies actually improve firm-level productivity in Vietnam. Firms in the clustered areas have higher productivities. However, localization economies do not improve the productivity of state-owned firms. This may represent the existence of local protectionism. Second, urbanization economies improve productivity only for foreign-owned firms. State-owned and private firms do not benefit from urbanization economies. These results imply that the agglomeration economies may not be fully effective in Vietnam, especially in urbanization economies. The weak urbanization economies are consistent with literature such as Henderson (2003) that only finds urbanization effects in high-tech industries.

In transition economies, state-owned firms still have a large presence. In Vietnam, these firms do not necessarily have lower productivity than other firms. However, these firms do not benefit from agglomeration economies both in localization and urbanization. Additionally, the presence of foreign-owned firms in Vietnam has increased recently. These firms benefit greatly from both localization and urbanization economies. Furthermore, our results suggest that the sources of these agglomeration economies are knowledge spillovers and labor pooling, whereas private firms benefit from agglomeration economies through transactions.

## 2. Location of Clusters, and Co-location and Productivity of Firms

Toshitaka Gokan, Ikuo Kuroiwa, and Kentaro Nakajima

## Background of the study

In Vietnam, many foreign firms have set up plants and formed industrial clusters in the suburb of large cities, because they can enjoy the benefits of agglomeration, as well as the good infrastructure facilities and amenities provided in large cities. However, they should also consider higher land rent and increased congestion in large cities.

Firms choose locations to maximize profits, whereas the location of state-owned enterprise (SOEs) reflects the policy considerations of the government, which must consider multi-dimensional objectives. In particular, the government often considers the development of disadvantaged areas at the cost of the benefits of agglomeration, so as to narrow regional disparities. Thus, the location choice of SOEs is not necessarily made based on the principle of profit maximization.

Location patterns of private firms are different from other types of firms because many private firms are owned by local entrepreneurs, who are widely spread across a country. In addition, many private firms are small- or medium-sized and have negligible or weak scale economies. Therefore, their plants and clusters are likely to spread across many different areas.

The location patterns of firms depend on the types of firms. Against this backdrop, the present study identifies the manufacturing clusters in Vietnam by type of firms with the method proposed by Mori and Smith (2013). Then, the geographical configurations of clusters are examined from the following two perspectives.

First, the spatial distributions of clusters are compared across different types of firms, especially with respect to population density. Then, the paper explores this relationship in greater detail by dividing the country into four layers of population densities.

Second, the paper considers the co-location of clusters. Co-location has been studied by regional economists such as Ellison and Glaser (1997), Ellison, Glaser, and Kerr (2010), and Duraton and Overman (2005). Emma, Carl, and Finn (2012) studied the factors for co-location in manufacturing industries in Vietnam. To measure the incidence of co-location, they used the indices of co-location, which are based on employment or establishment data.

In contrast, this study uses the incidence of clusters of different industries and different types of firms being located in the same district as a measure of co-location. Furthermore, the study examines the co-location of clusters using the Jaccard index and the Simpson index, which are helpful for measuring similarity between two sets of binary data.

Industrial clusters reduce production costs of firms and improve their productivity, when they can enjoy the benefits of agglomeration. Such agglomeration

economies can occur across different types of firms, as well as across different industries. This paper examines the impact of agglomeration economies on the productivity of firms.

## Results

There is a clear relationship between the variety of industrial clusters and the population densities. The spatial distribution of clusters of food and agriculture-related industries were highly concentrated in the sparsely and moderately populated areas, whereas those of machinery industries were concentrated in the densely and most densely populated areas. What is striking about SOEs is that 39 industries have a concentration of clusters only in the most densely populated areas. Private firms have a spatial distribution pattern similar to those of other types of firms, but a notable difference is that private firms have a lower concentration of clusters than other types of firms. For foreign firms, the eight industries that had the highest concentration in densely populated areas were machinery industries. This is because many foreign firms, especially in the machinery industries, locate in the suburbs of large cities.

The Jaccard index and the Simpson index were used to detect the co-location of clusters. The results show that there are a number of co-locations between and within different types of firms. In particular, SOEs and other types of firms had the highest incidence of co-location. This is because the number of clustered areas for SOEs is relatively small, so that the share of co-located areas becomes large, especially when the Simpson index is used. In addition, there are many cases where clusters of SOEs were completely contained by other types of clusters, as well as clusters of themselves.

Finally, we showed that clusters of all firms caused agglomeration economies. For SOEs, there was no agglomeration effect. The results for private firms showed that all the coefficients for clusters of three types of firms were positively significant. For foreign-owned firms, only the coefficient for the cluster of foreign-owned firms was positively significant. The co-location of clusters, especially for private firms, would add agglomeration effects and increase the productivity of firms.

## 3. Another “trap” in a middle-income country? : Urbanization as a new concern

Vietnam’s socio-economic development

Shozo Sakata

## Background of the study



Middle-income trap arguments point out the structural fault of rapidly developing countries, whereby institutional reformations tend to fall behind the rapid socio-economic transformations. This paper highlights another risk for rapidly developing countries, specifically, rapid urbanization, which can be another bottleneck for future growth in Vietnam.

The economic liberalization policy, (the so-called *Doi Moi* reform) lifted, at least partially, restrictions related to the physical movement of people. Since then, Vietnam has experienced drastic changes in the distribution of the population. Many people have claimed that massive rural-to-urban migration has led to rapid urbanization in Vietnam. Some are concerned about negative phenomena associated with migration and urbanization, while others appreciate the mobilization of young, “disguised unemployed” labor from rural areas to the urban manufacturing sector as an engine of growth.

Scrutinizing the statistical data, particularly those of the Population and Housing Censuses conducted in 1989, 1999, and 2009, this paper argues that the situation is not that simple. First, we should pay attention not only to urbanization per se, but also to the extremely high population densities in a limited number of places. Second, migration is not the only factor influencing urbanization. The processes of urban area formation have differed between the northern and southern regions of Vietnam: in the north, already densely populated rural administrative units acquire urban status as a result of national administrative reform, whereas quite a few individuals in industrialized cities, especially in the south, are still regarded as rural residents. Third, although physical transformations involved in the process of urbanization are well underway, institutional transformation in urbanized areas remains a major concern. That imbalance can partially explain the frequent land disputes in the 2000s.

## Results

As the data in this paper reveal, urbanization does not correspond with changes in real population movement and distribution. Population concentration differs substantially between the center of Ho Chi Minh City and, say, an urban town in Hai Duong Province. Urban populations can be “created” in the course of administrative reform. Analyses based on the national-level urbanization rate may disguise the real issues for the future of Vietnam’s socio-economic development.

The first problem described in this paper is the extreme population concentration in specific places, particularly Hanoi, Ho Chi Minh City, and the vicinities of these two big cities. This phenomenon may logically cause wage and land price hikes

that may then hamper the growth of labor-intensive manufacturing industries. The “middle income trap” argues that Vietnam’s development has relied heavily on capital investment, neglecting efforts to improve productivity. However, our data suggest that the Vietnamese government needs to invest more heavily in the development of local cities.

Furthermore, the efficiency of capital investment, especially in infrastructure projects, and not the amount of capital investment itself, must be to blame. Poor institutional capacities of the administrations of local cities, including corruption and disputes between local residents and local authorities, are among the causes of inefficient capital investment. Rapid urbanization must be complemented by modernized local government.

#### Reference:

- [1] Duraton, Gilles and Henry G. Overman. 2005. “Testing for Localization Using Micro-Geographic Data”. *The Review of Economic Studies*, 72 (4): 1077-1106.
- [2] Ercole, R. (2013) “Spatial Agglomerations of Two-Digit Manufacturing Industries within and across Vietnamese Locations,” mimeo.
- [3] Ellison, G. and Edward L. Glaeser. 1997. “Geographic Concentration in US manufacturing industries: A dashboard approach”, *Journal of Political Economy* 105 (5): 889-927.
- [4] Ellison, G., E. Glaeser, and W. Kerr (2010) “What Causes Industry Agglomeration?” *American Economic Review* 100(3), pp. 889-927.
- [5] Emma, Howard, Newman Carl, and Tarp Finn. 2012. “Measuring industry agglomeration and identifying the driving forces”. *WIDER Working Paper*, No. 2012/84.
- [6] Glaeser, E., H. Kallal, J. Shinkman, and A. Shleifer (1992) “Growth in cities,” *Journal of Political Economy* 100, pp. 1126-1152.
- [7] Henderson, V. (2003) “Marshall’s Scale Economies,” *Journal of Urban Economics* 53, pp. 1-28.
- [8] Howard, E., C. Newman, and F. Tarp (2012) “Measuring Industry Agglomeration and Identifying the Driving Forces,” *WIDER Working Paper*, No. 2012/84.
- [9] Jacobs, J. (1969) *The Economy of Cities*, Vintage, New York.
- [10] Marshall, A. (1920) *Principles of Economics*, Macmillan, London.
- [11] Mori, T. and T. Smith (2013), “A Probabilistic Modeling Approach to the Detection of Industrial Agglomerations,” *Journal of Economic Geography* 14, pp.547–588.