Chapter 4

Factors of Agglomeration in Vietnam and Recommendations

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March 2008

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INTRODUCTION

Vietnam now presents a picture of rapid economic growth after being damaged badly by years of wars. It is supposed to be an attractive destination for an increasing number of foreign investors. In that context, industry plays an important role for sustainable development and poverty reduction. Lessons from other developed countries show that industrial agglomeration and clustering become an indispensable trend in industrialization and modernization.

Under a research agreement between Bangkok Research Center (BRC) and Institute for Industrial Policies and Strategies (IPSI), this paper, then, focuses on issues related to agglomeration and industrial clusters in Hanoi. This study is the outcome of two research methods: a mail survey as well as a study of cases in Hanoi.

The first part of this paper presents the cluster formation for industries in Vietnam, including factors on agglomeration and industrial cluster. Next, it then reveals the results of the mail survey based on a descriptive analysis and econometric analysis with the assistance of Japanese experts. Generally, the results from the mail survey show that agglomeration in Vietnam started from the mid-1990s, thanks to its main attractions: labor, size of market, and individual linkages between foreign direct investments (FDIs). Vietnam's unique qualities first attracted small and medium enterprises (SMEs) and eventually, large firms.

In the earlier stage of agglomeration, small firms producing raw materials and final products set up operations in Vietnam, attracted by the customs procedures, intuitional infrastructure, and living conditions. In the later stage, firms that came in were attracted by its physical infrastructure and the intellectual property rights system.

This paper concludes with some policy-related recommendations.

1. THE CASE STUDY

1.1. Industrial Agglomeration and Cluster in Vietnam

Although *industrial cluster* is a very new concept in Vietnam, some industries had long formed agglomerations and spontaneously established clusters in the country. Electronics firms gather most in the south of Vietnam, particularly in Ho Chi Minh (HCM) city and Dong Nai province. Such feature labor-intensive industries such as garment and footwear. Vietnam has been performing agricultural products-processing all over the country, from the Mekong Delta (in the South) to the Red River Delta (in the North). Dung Quat, a new province in Central Vietnam, is famous for its oil refinery. Hanoi has developed some heavy Industries such as those engaged in the manufacture of motorcycles and bikes, mechanics, and iron processing. The largest city of Viet Nam, Ho Chi Minh City, prides itself with its IT industry. All these were already in Vietnam even before the country drew up its national industrial development policy/strategy. These are only the spontaneous formation of clusters consisting of foreign drivers (Honda, Vietnam Manufacturing and Export Processing Holdings Limited, and Canon), similar to the pyramidal cluster.

1.2. Geographical Industrial Concentration in Hanoi

Before the 1980s, industrial factories were already spread out in different districts of Hanoi.. Today, industries have concentrated in nine areas: Thuong Dinh, Minh Khai-Vinh Tuy-Mai Dong, Van Dien-Phap Van, Giap Bat-Truong Dinh, Cau Buou, Chem, Duc Giang-Cau Duong, Cau Dien-Mai Dich, and Dong Anh. Hanoi also has six industrial sites with a total area of about 1.164 hectares, drawing in 114 investment projects with a total capital of about US$1,201 million. Further, 18 other projects in small and medium industrial zones have been planned. These industries are mainly interdisciplinary.

Over the past few years, these zones have contributed to resolving enterprises' problem on manufacturing premises, promoting industrial manufacturing, drawing in

foreign investments, creating a favorable investment environment in Hanoi, and creating jobs for employees.

1.3. Factors Affecting to Industrial Cluster Development in Vietnam

1.3.1. Business Environment

Administrative reforms, together with the Enterprise Law, played an important role in recovering and developing the economy, increasing export turnover and budget revenues, creating jobs, eliminating hunger and reducing poverty, and accelerating the formation and development of the market economic institutions. The 2005 Enterprise Law, which was based on the 1999 Enterprise Law, is one of the major reforms in business in Vietnam. The law took effect on July 1, 2006 and is expected to level the playing field for local private businesses as well as state-owned and foreign-owned businesses. The new law helps simplify procedures and cut down expenditures for businesses and improve the business environment. In 2006, Vietnam's prime minister issued Directive No. 32 to regulate administrative discipline and rules in handling requests of individuals and enterprises. The directive requests state agencies to recheck and amend regulations that pose as bottlenecks in administrative procedures; publicize immediately the process, procedures, and time limit for handling people's requests; strengthen internal control and monitoring; and handle resolutely negative and harassments of officials and public servants.

Land law was set in 1993 and amended in 2003. Aside from incentive regulations, land support and infrastructure usage also exist via other incentive laws on private investment. Generally, the law regulates some supporting policies of the state on enterprises: for instance, publicizing land usage projects, developing small and medium industrial zones in poor localities, and building infrastructure outside industrial parks and processing zones.

1.3.2. Supporting Industry

Vietnam has a successful supporting industry that provides supplies for packaging (paper, wood or plastic) to manufacturers. Eighty percent of motorcycles assembled in Vietnam have parts (e.g., small plastic and metal parts, frame, tires and tubes, and batteries) made in Vietnam as well. For the electric and electronic industries, meanwhile,

only 20-40 percent is locally made but the proportion is increasing. Textile garments and footwear producers import 80 percent of their materials.

In general, however, the supporting industry in Vietnam is not fully developed. Technology remains poor. Manufacturing factories for supporting materials such as iron, steel, plastics, technical rubber, fundamental chemicals, electronics parts, cotton, fiber, and footwear are insufficient. Processing technology is out-of-date. Couple this with problems on low energy power, high prices and unstable quality. The technology used by the FDI sector is more modern; however, it only meets the demands of their parent companies. Vietnam's economic environment does not yet allow every economic sector to invest in supporting manufacturing in the long term. Economic linkage is mainly vertical.. Information sharing and enterprise linkage is restricted. In fact, FDI investors do not pay much attention to domestic supporting enterprise development. On the other hands, domestic enterprises face difficulty in approaching FDI enterprises due to their business conditions. The role of professional associations does not impact much on businesses as a whole.

1.3.3. Business Development service (BDS)

In Vietnam, Business Development Service (BDS) begins to develop and accounts for a minority in gross domestic product (GDP)—about 1 percent with low growth (1-2% per year). Not only enterprises but authorities as well have poor awareness of BDS as a tool for business development. The BDS market such as those focusing on training, accounting, financial consultant, and tax and management consultancy is less developed in term of both its supply and demand.

Enterprises' poor awareness

Although Vietnamese enterprises have grown stronger, the awareness of both society and enterprises of the BDS's benefits is still poor. Enterprises often feel uncomfortable to give information to independent consultants. Smaller enterprises also lack the clout to collect information on business services in the market. The situation had only grown better when the government included a BDS development goal in Vietnam's growth and poverty reduction program and issued a decree on "Consultant

Service Provision and Usage" to officially recognize the BDS role in Vietnam's development.

Limited supply and demand

Since SMEs normally have relatively lower income and revenues, their demand for external services including BDS is also low. Many SMEs say that they are unable to commission these services at prevailing market prices. Moreover, a number do not recognize the potential benefits BDS can bring, especially intangible services such as management and strategic consultancy. Similarly, the supply of BDS entities is limited due to reasons that may include, for instance, situations where service providers do not still have the ability to appreciate domestic enterprise's specific demands or lack the skills and know-how in designing appropriate service for local demands. Besides lack of skills, these also have inadequate consultancy experience, particularly in services of most value to customers.

Lack of information

Vietnam's statistical data on industries and market is not yet systematized and unified. Information on external markets and the world economy, technical books or specified information for providers are not always available. This is a significant obstacle since such information and tools are factors that make it possible for BDS providers to provide quality servicesto enterprises.

Remaining legal barriers

A favorable legal environment is one of the factors that support the development of Vietnam's BDS market. Thus, recent legal reforms (such as the Enterprise Law) and economic liberalization, particularly in the service sector, contribute to make Vietnam's BDS market grow in terms of its supply and of the demand for it. The government has exerted extra efforts to improve the investment and business environment and therefore, to enhance enterprises' trust; however, there remains barriers to Vietnam's BDS. Some of these issues include are the expensive market entry fees for some BDS services,

including those on training, auditing or intellectual property. Furthermore, there remain contradictions between existing legal documents, and the Enterprise Law regarding BDS services.

1.4. Encouraging and Hindering Factors on Cluster Formation in Vietnam

The creation of economic clusters is a strong requirement for Vietnam's economic development. The agglomeration of business has in fact been visible in various areas.. Vietnam has had some successes in industrial zone development.

There still exits weak linkages among local firms, and between local firms and MNCs (multinational cooperations)/FDIs. In addition, the government, firms, and social public lack enough knowledge about creating linkages. Moreover, the legal system fails to include laws on subcontracting, and on quality of semiproducts, etc. Vietnam hardly makes an effort nor support policies to linkages. The BDS, an important factor to develop industrial cluster, remains an unfamiliar territory to most enterprises.

2. THE DESCRIPTIVE ANALYSIS OF MAIL SURVEY

In this study, questionnaires were sent to 1,000 respondents consisting of 400 Vietnamese, 400 FDIs and 200 join-venture firms. Of these, 600 are in Manufacturing (chemical, textile, garment, shoes, plastic, wood, steel, motorbikes, iron, and electronics), 100 in Construction, 100 in IT, 100 in Service, and 100 are of other categories. As of December 31, 2007, 102 valid respondents were confirmed, of which 18 were interviewed face to face. Many are Japanese firms. Vietnamese firms accounted for over 70 percent of the respondents; the remaining 30 percent (including FDIs and joint-venture firms) came from: other parts of Asia (mainly, Japan, which has 22 firms or 76% of the Other Asia group]), the United States (3 firms or 10%) and the European Union (4 firms or 14%). No respondent came from ASEAN nor from China.

**Figure 1: Establishment Year of Foreign Firms.**
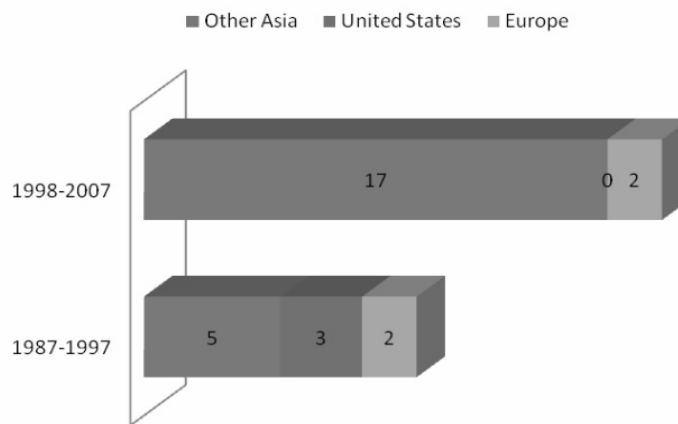
Source: Author.

Prior to 1980, there were only six enterprises in Hanoi. However, this number has gone up year after year. When grouped by economic development periods, 33 respondent-enterprises (32%) came from the third period, *"Doi mo"* to the East Asian economic crisis period (1987-1997), and 62 firms (61%) came from the post crisis period to the present (1998-2007). Foreign enterprises started their business in Vietnam in the third period. At that time, there only three US firms present in Hanoi. After the crisis, Vietnam in general and Hanoi in particular have increasingly attracted more Asian firms. The EU firms were established during the two periods.

Over the past few years, the respondent-firms succeeded to expand their business scale (in terms of employees, capital and assets) in Hanoi. Respondents' main lines of business are manufacturing (60%), IT and other business service-related firms (around 10%), wholesale and construction firms (6%-7%). Retail firms mainly engage in the finance and insurance fields. When viewed by market structure, 65 percent of enterprises cater to the domestic market as their main markets. The next important markets of respondents are the ASEAN and the rest of Asia with 13 percent.

From the interviews, the market most mentioned besides China and ASEAN, is Japan. Sources of inputs of firms include: domestic (50%), "Other Asia" (23%), ASEAN (12%), and China (10%). Among these markets, the main input sources of FDI

and joint-venture firms (Figure 2) are from Other Asia (12%). Raw material sources for manufacturing firms are classified into four main groups: Domestic sources have gone down to 36 percent while Other Asia, ASEAN and China garnered 34 percent, 13 percent and 12 percent, respectively.

Figure 2: Main inputs sources of FDI and Joint-Venture Firms.
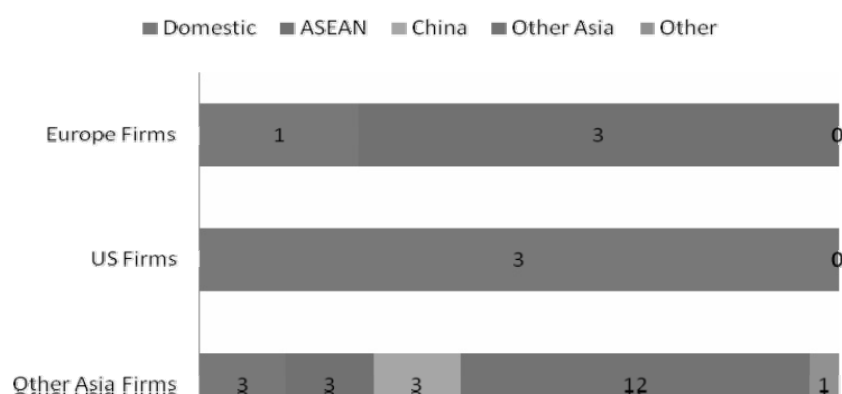
Source: Author.

2.1. Reasons for Establishment in Hanoi

Answers to question 7 of the questionnaire reveal the reason for selecting Hanoi as a business location. Of these, four reasons assessed as "*very important*" are: 12-*Size of the local markets* (59 firms); 17-*Availability of skilled labor and professionals* (43 firms), 1-*Investment incentives including tax incentives* (40 firms), and 19-*Access to cutting-edge technology and information* (39 firms). Indicators appraised as "*somewhat important*" are: 11-*Protection of intellectual property rights*, 15-*Request by large/related company* (35 firms), 6-*Infrastructure (telecommunications, IT,* by 34 firms).

Figure 3: Reasons for Establishment of Operation in Hanoi.
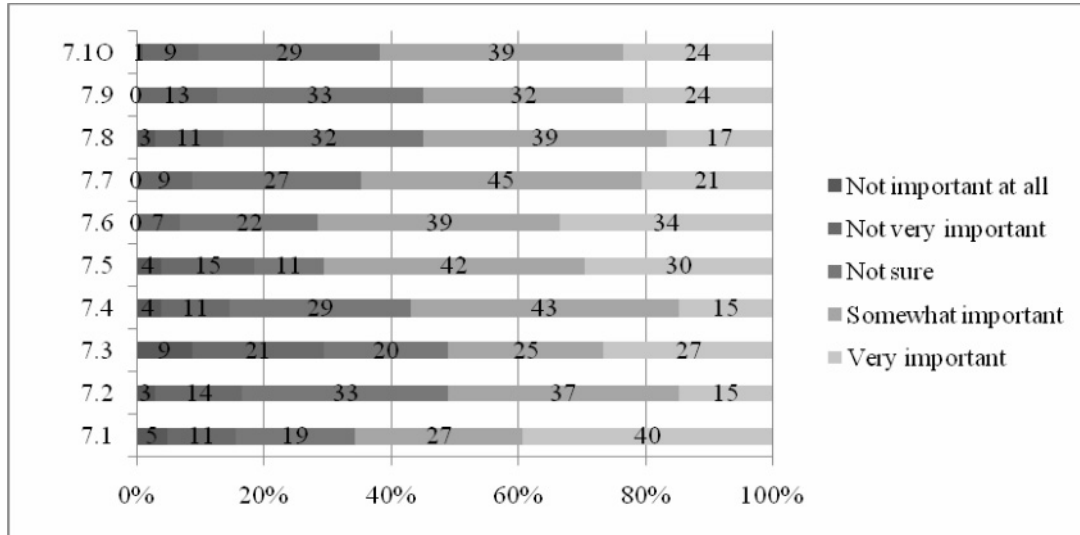
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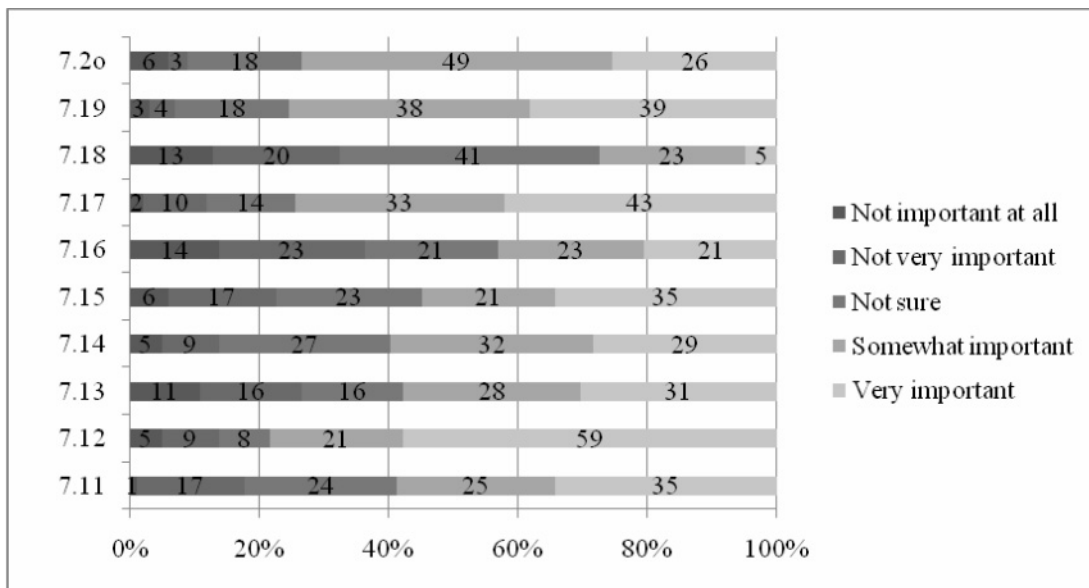
Source: Author

Enterprises, meanwhile, do not pay much attention to the following reasons: *2-Liberal trade policy, 4-Local content requirements, rule of origin, 6-Infrastructure (telecommunications, IT), 18-Other companies from the same country are located here (synergy),* and *20-Living conditions*. While Vietnamese firms have the same sentiments

as the whole sampled respondents, FDI and joint venture firms pay attention to: *5-Physical infrastructure (roads, highways, ports, airports, etc.), 12- Size of local markets, 14-Proximity to suppliers/subcontractors, and 15-Request by large/related company.* In addition, the indicator *1-Investment incentives including tax incentives,* is assessed as "*very important*" by both Vietnamese and other Asian firms.

What the most important indicators are depend on the country of the respondents. Other Asian firms consider the following indicators to be the most important: *12-Size of local markets, 14-Proximity to suppliers/subcontractors, 15-Request by large/related company, 1-Investment incentives including tax incentives,* and *6-Infrastructure (Telecommunications, IT).* The US firms also reveal their reasons for selecting Hanoi as follows (by order of importance): *5-Physical infrastructure (roads, highways, ports, airports, etc.), 8-Government institutional infrastructure, 10-Legal system, 15-Request by large/related company, 17-Availability of skilled labor and professionals,* and *19-Access to cutting-edge technology and information.* The order of importance according to the EU firms are: *12-Size of local markets, 15-Request by large/related company.*

2.2. The Importance of Hanoi's Current Conditions

Question No 8 intends to unravel the importance of Hanoi's current business conditions to enterprises as well as their satisfaction with these. Figure 4 shows that enterprises consider the following to be "*very important*" to Hanoi's current conditions: *12-Size of local markets, 17-Availability of skilled labor and professionals, 9-Access to cutting-edge technology and information, 13-Access to export markets,* and *6-Infrastructure (telecommunications, IT).*

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Figure 4: "Very Important" Indicators.
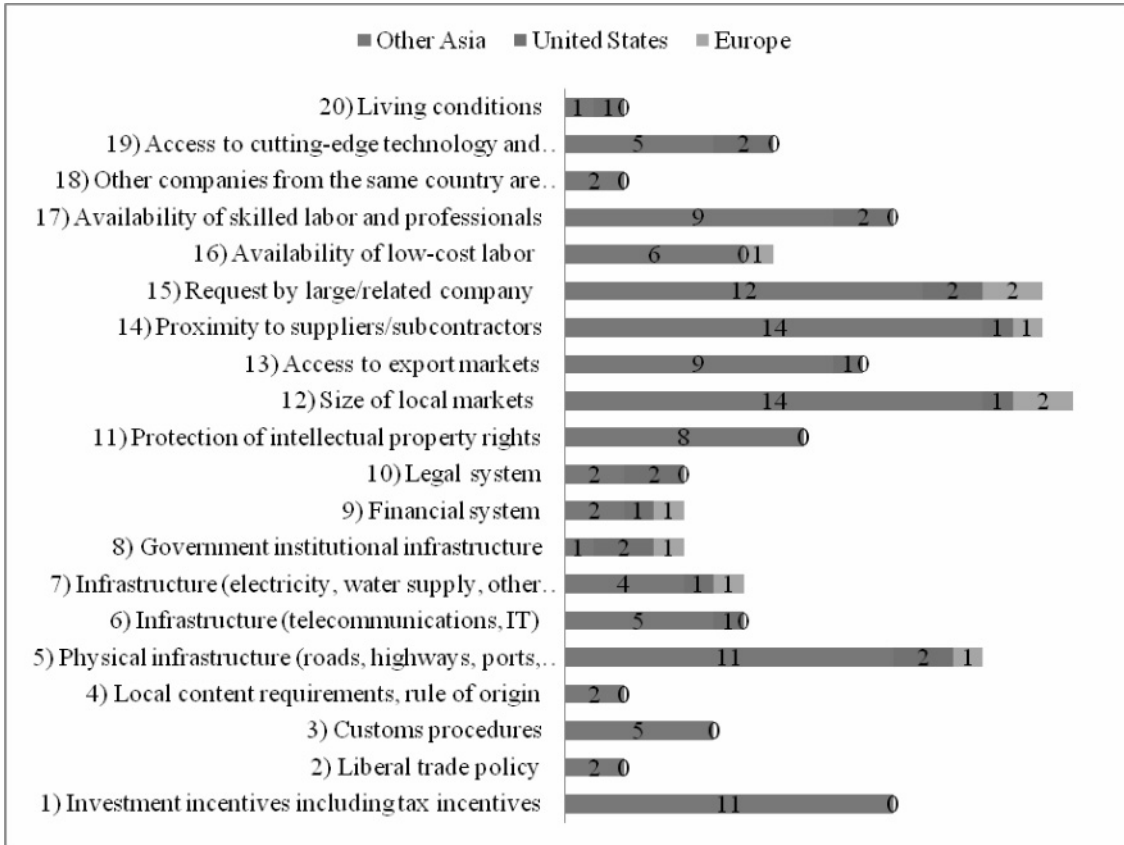
Source: Author.

Meanwhile, Vietnamese firms' results for this question are (in order of importance): *12-Size of local markets* (42 firms), *17-Availability of skilled labor and professionals* (39 firms), *19-Access to cutting-edge technology and information* (34), *11-Protection of intellectual property rights* (32). Other Asian *countries* consider *13-Access to export markets* to be the most important factor among the selections. This is followed by *15-Request by large/related company* and *17-Availability of skilled labor and professionals* ranks last (responded by 11/22 firms for each issue). On the other hand, US firms have a different set of results. All US firms (3/3 firms) think *6-Infrastructure (telecommunications, IT)* to be very important. Remaining issues appraised to be "*very important*" by two-thirds of the US firms are: *2-Liberal trade policy, 10-Legal system,* and *19-Access to cutting-edge technology and information.*

Meanwhile, EU firms (2/4 firms) consider *2-Size of local markets* to be a very important factor.

Since the time they were established in Hanoi, firms have changed slightly the factors they consider as "*very important*". To the Vietnamese firms, Hanoi's attraction remains to be its 12-*Size of local markets* but now adds one more reason: 17-*Availability of skilled labor and professionals*. Although 15-*Request by large/related company* is still a very important indicator, other Asian countries' firms change their priority from 12-*Size of local markets* and 14-*Proximity to suppliers/subcontractors,* to 13-*Access to export markets* and 17-*Availability of skilled labor and professionals*. This proves that businesses in Hanoi have expanded their market and have a high requirement for skilled labor. Also, US firms are no longer interested in 5-*Physical infrastructure (roads, highways, ports, airports, etc.)* but they care about *6-Infrastructure (telecommunications, IT)*. This is because US firms are now engaged in the IT and services business. Although doing business in Hanoi is no longer a 15-*Request by large/related company*, EU firms still pay attention to 12-*Size of local markets* at the time they are to establish their operations in Vietnam.

2.3. Satisfaction with Hanoi's Conditions

The following factors satisfy enterprises the most: 11-*Protection of intellectual property rights*, 6-*Infrastructure (telecommunications, IT),* 18-*Other companies from the same country are located here (synergy)*, 19-*Access to cutting-edge technology and information*, 20-*Living conditions*. However, it is also a fact that four of the above factors are not given much attention when enterprises decide to do business in Hanoi.

Vietnamese firms (60/73 firms or 82%), meanwhile, are satisfied with the *Size of local markets* and no firm has responded, "*not satisfied at all*". However, only 14 firms (19%) have said they are very satisfied with *Availability of skilled labor and professionals*. . Relatedly, around 13 enterprises (16%) are clearly dissatisfied with this very important indicator.

Figure 5: Current "Very Satisfaction" Evaluation.
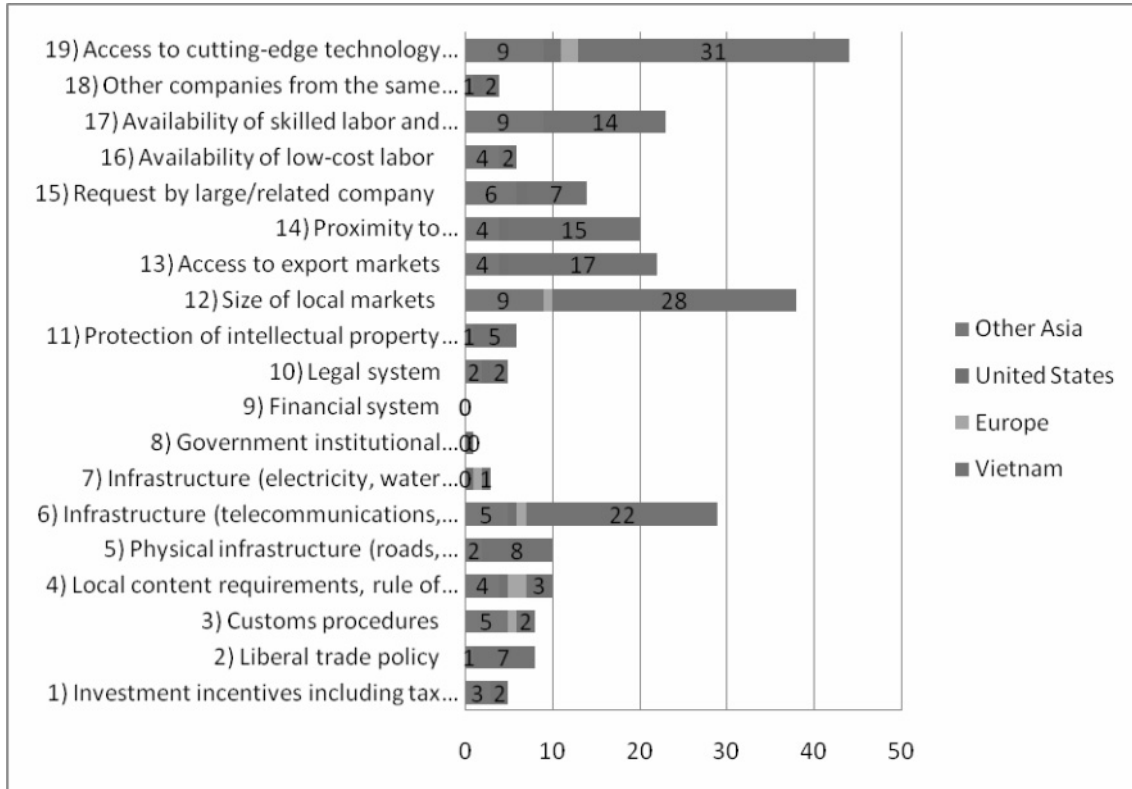
Source: Author.

Figure 5 indicates that among the 22 *Other Asia* firms, no one gave a "*not satisfied at all*" rating to their three most important indicators. In contrast to the Vietnamese firms, Other Asia firms seem to have no issues with the *Availability of skilled labor and professionals* since nine out of 22 respondents gave a "*very satisfied*" answer and eight out of 22 were "*somewhat satisfied*". For indicator 15-*Request by large/related company*, 13 out of 22 firms are not satisfied while two respondents are somewhat satisfied. The Indicator *Access to export markets* satisfies 68 percent of the group. Next, three US firms consider *Infrastructure (telecommunications, IT)* to be the most important, where one of them gave this indicator a "*very satisfied*" rating; the other two gave it a "*somewhat satisfied*," and "*not sure*" answer, respectively. No respondent indicated, "*not satisfied*". Finally, of the four EU firms, one gave the *Size of local markets* a "*very satisfied*" answer; the remaining three firms are "*somewhat satisfied*".

2.4. Current Situation

2.4.1. Remaining Issues

When it comes to enterprises' common complaints, *Availability of low-cost labor* does not satisfy 27 firms (where 8 are not satisfied at all and 19 not very satisfied). Likewise, 17 respondents are not very satisfied with *Request by large/related company*, Twenty firms (5 not satisfied at all and 15 not very satisfied) rated *4-Local content requirements, rule of origin* poorly as well. . So with *3-Customs procedures* (17 firms), *1-Investment incentives including tax incentives* (15 firms), *5-Physical infrastructure (roads, highways, ports, airports, etc.)* (14 firms). Indicator *18-Other companies from the same country are located here (synergy)* encounters less complaint and is, in fact, considered satisfactory by 28 firms.

2.4.2. Innovation

Over the past three years, firms have focused on markets and product development. In the survey, a Yes response was given by 81 percent of respondent-firms to *Introduction of new goods* and 85 percent to *Opening of a new market*. The four EU firms, three US companies and 86% of Vietnamese firms have, in fact, expanded their markets in the last three years. Meanwhile, Asian firms rank the last with 77 percent only in terms of expansion. Enterprises are as much interested in upgrading manufacturing in terms of production method as well as material source as they are in the market and product themselves.

As far as their willingness to cooperate in innovation is concerned, 17 out of 22 of those in the Other Asian group confirm that Yes, they have a good relationship with MNCs. On the other hand, domestic firms seem to have less linkage with MNCs

2.4.3. Future Plans

Only two firms (1 Vietnamese and 1 Other Asia) are uninterested to continue their business in Hanoi. Vietnamese firms seem to hesitate to expand to other locations in Vietnam whereas only two FDI firms say, No (i.e., will not expand) and two others are "*not sure*".

When it comes to the possible markets to expand to, 35 percent focuses on the

ASEAN (except Cambodia, Laos and Myanmar, or CLM), and 20 percent each to CLM, Other Asia, and others. Only 5 percent selects China. One can observe here that all EU and US firms intend to expand their market beyond Vietnam whereas only over half of other Asia firms are considering such a strategy.

2.5. Summary of Descriptive Analysis

The important factors that pose the greatest impact on any firm's Hanoi operations are:

- *Size of local market*
- *Physical infrastructure (roads, highways, ports, airports, etc.),*
- *Proximity to suppliers/subcontractors*
- *Request by large/related company*
- *Investment incentives*

Important factors that can satisfy enterprises doing business in Hanoi are

- *Protection of intellectual property rights*
- *Infrastructure (telecommunications, IT),*
- *Presence of other companies from the same country that are located in Hanoi (synergy),*
- *Access to cutting-edge technology and information,*
- *Living conditions*

Of the issues evaluated as important, the following got good ratings:

- *Size of local markets*
- *Availability of skilled labor and professionals,*
- *Access to export markets*
- *Infrastructure (telecommunications, IT)*

Issues deemed as "*not very satisfied*" are

- *Availability of low-cost labor*
- *Request by large/related company*
- *Local content requirements, rule of origin*

- *Customs procedures*
- *Investment incentives including tax incentives*
- *Physical infrastructure (roads, highways, ports, airports, etc.)*
- *Other companies from the same country are located here (synergy)*

According to the analysis above, the first important factor for agglomeration in Hanoi is the "*Size of the local market*". Although Greater Hanoi is not the most populous in Vietnam (in comparison with Ho Chi Minh City or Mekong Delta), many domestic firms and government agencies concentrated here. Also, the area has citizens who received the best education and highest income in the country. These factors caught the attention of FDI and joint venture firms. It is also the most satisfactory factor evaluated by local firms. Eighteen out of 22 *Other Asia* firms feel *satisfied* and *very satisfied on the overall*. All four EU firms are satisfied, while only one US firm does not highly appreciate the local market.

The next important factor for attracting FDI and joint venture firm to Hanoi is *Proximity to suppliers/subcontractors*. This is also synonymous with *Request by large/related company*, which applies to new entrants in the Vietnam market. In some interviews with FDI firms (especially those from Japan), interviewees had indicated that their parent companies still wanted to do business in Hanoi first despite the high appreciation for Ho Chi Minh's market.. They have assumed that Hanoi has a *political* position as the capital of Vietnam. *Proximity to suppliers/subcontractors* does not simply refer to providers or subcontractors but to government agencies, too, which is a comparative advantage of Hanoi.

Vietnamese enterprises have invested in Hanoi because of its skilled labor. Hanoi is known for its quality and trained human resources, especially in the fundamental industrial manufacturing such as mechanics, electricity, electronics, and machinery assembling. In addition to basic training, the presence of industrial manufacturing in Hanoi for several years has created experienced and skilled staff. However, these good and skilled labor resources lack creativeness, self-control, and foreign-language capacity. Note that in the initial period of agglomeration, these attributes are one of the reasons Hanoi could attract investment. Table 1-a indicates enterprises' degree of satisfaction with this factor.

Table 1: Satisfaction with Skilled Labor.

(a) By Sector

	Not satisfied at all	Not very satisfied	Not sure	Somewhat satisfied	Very satisfied	Total
Manufacturing	1	7	17	22	14	61
Construction	1	0	2	2	1	6
Wholesale	0	2	0	3	2	7
Retail	0	0	0	0	1	1
Finance/ Insurance	0	0	1	2	0	3
IT services/ Software	0	0	4	5	1	10
Other business services	0	2	1	5	4	12
Other	0	0	0	2	0	2
Total	2	11	25	41	23	102

(b) By Country Origin of FDI Firms

	Not very satisfied	Not sure	Somewhat satisfied	Very satisfied	Total
Other Asia	0	5	8	9	22
United States	0	1	2	0	3
Europe	1	2	1	0	4
Total	1	8	11	9	29

Source: Author.

Thirty-six out of 61 manufacturing firms (59%) say they are "*satisfied*" and "*very satisfied*" with the existing skilled labor; however, 13% of the manufacturing firms seem dissatisfied while 60 percent of IT firms are satisfied and no firm is dissatisfied. Of the FDI firms (Table 1-b), 77 percent of Other Asia firms evaluate these as "*good*", including nine firms that gave a "*very satisfied*" response. Two-thirds of the US firms sound not very satisfied with skilled labor. Furthermore, EU firms assess the factor as "*not very satisfied*" since only one firm seems to be satisfied while the remaining other companies (over 4 firms) are not satisfied with skilled labor of Hanoi.

Investment incentives (including tax incentives) is another common factor that attracts Vietnamese and other Asia firms to Hanoi. However, Hanoi does not yet offer the best investment incentive policy in the country. In the 2007 survey, *Investment incentives* satisfy 40 percent of the firms, including 55 percent (12/22) of the *Other Asia*

firms and around 66 percent of the US firms questioned. Only 37 percent of Vietnamese firms are satisfied while all four EU firms seem not very satisfied.

Table 2: Satisfaction with Investment incentives by Country Origin of Firms.

	Not satisfied at all	Not very satisfied	Not sure	Somewhat satisfied	Very satisfied	Total
Other Asia	1	1	8	9	3	22
United States	0	0	1	2	0	3
Europe	0	1	3	0	0	4
Vietnam	0	12	34	25	2	73
Total	2	11	25	41	23	100

Source: Author.

3. ECONOMETRIC ANALYSIS OF THE MAIL SURVEY

3.1. Factors of Agglomeration

The agglomeration in Vietnam can be divided into three main periods: (1) before 1987; (2) 1988-2000; and (3) after 2001. The year a firm or business activity was established in Vietnam is considered a dependent variable in the econometric analysis. The firms established in the earlier period are referred to as "first movers," and those that came in the later period as "latecomers". Independent variables, on the other hand, which would explain why investors are attracted to the region, are selected from the questionnaire data based on the following characteristics: (1) firm size; (2) attraction factors; and (3) functions of the companies when they were first established.

The relationship between the year of establishment and the size of firms is examined to uncover whether the agglomeration is triggered by large firms such as MNCs or by small ones, either local or foreign. This issue is related to the "Flowchart Approach," which was initiated by Kuchiki (2007), Kuchiki and Tsuji (2005, 2008), and Tsuji *et al* (2006).[i] Meanwhile, three aspects of a firm size are asked in Question 3 of the survey form, namely: (1) number of full-time employees; (2) total assets; and (3) paid-up capital.

Figure 6: Accumulated Number of Office Established in Vietnam.
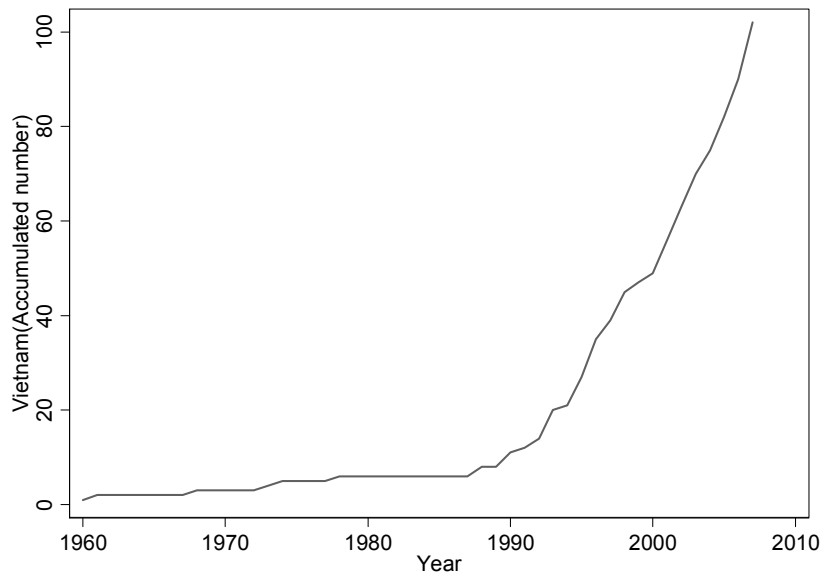
Source: Author.

After determining the dependent and independent variables, three models were estimated according to the definition of the firm size. The Ordered Logit Estimation is adopted, and the Full Model and the Selected Model are estimated. The former model takes all variables into account, while the latter selects variables that are considered to significantly influence the dependent variables. It should be noted that in these Ordered Logit Models, latecomers are taken to be standard by the normalization, and accordingly, a positive (negative) sign of estimated coefficients indicates that they influence only latecomers (first movers). The summarized results are presented below, beginning with the estimation using the number of full-time employees as the variable representing the firm size.

(a) Firm size.

In the Full Model, which utilizes all dependent variables in the estimation, firms with 50-90 and those with 300-399 employees have negative signs with the 5 percent significance levels, and there is no other significant firm size. Since signs are negative, these smaller companies are first movers, but in general no significant relationship between the firm size and the year the business was established is found.

(b) Attracting factors.

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Among factors that attracted firms to come to Vietnam, *Customs procedures* (5% significance level), *Government institutional infrastructure* (20%), and *Living conditions* (20%) have negative signs, which implies that these factors influenced first movers. On the other hand, *Physical infrastructure (roads, highways, ports, airports, etc.)* (5%), and *Access to cutting-edge technology and information* (10%) are positive. All these four factors influenced latecomers to agglomerate in Vietnam.

(c) Function of companies.

Human resources development (5%) has a negative sign, and first movers' business activities include this function. In Table 3, the results of the Selected Model are also presented. The number of independent variables is reduced by eliminating irrelevant ones so as to increase accuracy of the estimation in terms of log likelihood, for instance. The Selected Model finds a new variable in firm size with 100-199 employees, which has a negative sign and 5 percent significance level. This reinforces the assertion mentioned earlier that first movers are SMEs. The Selected model raises significance levels of variables such as physical infrastructure and access to new technology and information, and lowers the significance level of customs procedures. The Selected model coincides with the Full model and strengthens the latter's results.

Table 3: Results of Estimations: Agglomeration

		Employees		Assets		Capital	
		Full model	Selected model	Full model	Selected model	Full model	Selected model
Q3)	2) 10,000-24,999(US$)/10,000-24,999 (US$)	[**]	[**]				
	3) 100 - 199/25,000-49,999/25,000-49,999		[**]		[**]		
	4) 200 - 299/50,000-74,999/50,000-74,999						
	5) 300 - 399/75,000-99,999/75,000-99,999	[**]	[**]	**	+	+	+
	6) 400 - 499/100,000-499,999/100,000-499,999			[+]	[+]		
	7) 500 - 999/500,000-999,999/500,000-999,999						
	8) 1,000 - 1,499/1 M-4.9M/1M-4.9M						
	9) 1,500 - 1,999/5M-9.9 M/5M-9.9M						
	10) 2,000 & above/10M & above/10M & above						
Q8)	1) Investment incentives including tax incentives						
	2) Liberal trade policy				+		
	3) Customs procedures	[**]	[+]	[**]	[**]	[**]	
	4) Local content requirements, rule of origin						
	5) Physical infrastructure (roads, highways, ports, airports, etc.)	*	**	+			
	6) Infrastructure (telecommunications, IT)						
	7) Infrastructure (electricity, water supply, other utilities)			[**]			
	8) Government institutional infrastructure	[+]	[*]	[**]	[**]	[**]	[**]
	9) Financial system			*			
	10) Legal system						
	11) Protection of intellectual property rights	**	**	**	**	+	*
	12) Size of local markets			[+]			
	13) Access to export markets						
	14) Proximity to suppliers/subcontractors						
	15) Request by large/related company						
	16) Availability of low-cost labor						
	17) Availability of skilled labor and professionals			[**]		[*]	
	18) Other companies from the same country are located here (synergy)						
	19) Access to cutting-edge technology and information	*	**	*		+	**
	20) Living conditions	[+]	[+]	[+]			
Q6)	1) Retail/ Wholesale trade						
	2) Production (raw-material processing)			[+]	[*]	[+]	[+]
	3) Production (components and parts)						
	4) Production (final products)			[+]	[*]	[+]	
	5) Purchasing/ Procurement/ Logistics						
	6) R&D/ Consulting						
	7) Human resources development	[**]					
Nob		102	102	102	102	102	102
Log likelihood		-56.846	-62.216	-64.059	-73.069	-67.423	-76.743
Pseudo R2		0.360	0.300	0.279	0.178	0.024	0.136

Note 1: [ ] indicates that the coefficient is negative, and items without [] imply the coefficient is positive.
Note 2: **, * and + indicates that coefficient is at the 5, 10 and 20 percent significance level, respectively.

3.2. Industrial Upgrading and Innovation

Here, the current situation on industrial upgrade and innovation in Vietnam is examined. As a result of agglomeration, technology and know-how have been transferred from large and advanced firms such as MNCs to local firms. The flow of

denser information among them as well as the value given to human resources has created endogenous forces that lead to an industrial upgrade and innovation among all firms in the region. To examine, four categories of upgrade or innovation are defined according to Schumpeter's concepts, namely: (1) introduction of new goods; (2) adoption of a new technology; (3) opening of a new market; and (4) acquisition of new input such as raw materials. Question 9 asks, "What upgrades have your company carried out in the last three years, and what upgrades do you intend to achieve in the next three years?" Respondents are then asked to reply either "yes" or "no". These four models are estimated by taking the replies, "yes" or "no" to Question 9 as dependent variables, while the independent variables consisted of the following: (1) satisfaction with Vietnam's economic circumstances such as policy measures and economic conditions, as enquired in Question 8;[ii] (2) function(s) carried out at the time of establishment of the first office, as enquired in Question 6; and (3) year of establishment of offices, as enquired in Question 1. These variables are summarized in Table 3. The results of four estimates are presented in Table 4 in the same way as in Table 3. The next sections now discuss factors that promote industry upgrade or innovation in each model.

3.2.1. Estimation of New Goods Model

This section starts with an introduction of new goods in the Full Model. In the same way as that in Table 3, only significance variables are noted, with stars indicating significance levels, and variables having a negative (positive) sign written with (without) brackets. Note further that factors with negative (positive) signs indicate that they discourage (encourage) innovation. Table 4 shows that no significant variable is identified in the Full Model, but in the Selected Model, variables with positive signs are *Liberal trade policy* (5% significance level), *Customs procedures* (10%), *Protection of intellectual property right* (5%), *Proximity suppliers/subcontractors* (10%), and *Other companies from the same country are located here* (5%). These encourage upgrade and innovation. On the other hand, *Local content requirement, rule of origin* (5%), *Physical infrastructure* (roads, highways, ports, airports, etc.) (5%), *Government institutional infrastructure* (5%), *Size of local markets* (5%), *Requested by large/related companies* (5%), and *Availability of low-cost labor* (10%) are found to have negative signs; accordingly, they are required to improve so as to pave the way for further upgrade and

innovation.

When assessed by company's function, *Production (raw-materials processing)* (10%), *Production (components and parts)* (5%), and *Production (final products)* (5%) have negative coefficients, and they discourage any upgrade. The Selected Model also shows that the year the business was established has a positive negative sign with a 10 percent significance level, which implies that first movers are more innovative.

3.2.2. Estimation of New Technology Model

This section now examines the model of the adoption of a new technology. At first, *Liberal trade policy* (5% significance level), *Infrastructures (electricity, water supply, other utilities)* (5%) *Government institutional infrastructure* (10%) and *Size of local markets* (5%) have positive signs and accordingly encourage upgrade of this type of model. On the other hand, *Physical infrastructure (roads, highways, ports, airports, etc.)* (10%), *Infrastructure (Telecommunications, IT)* (5%), and *Legal system* (5%) are found to be negatively related.

When assessed by company function, *Retail/wholesale trade* (5%), *Production (components and parts)* (5%), *Production (final products)* (5%), and *R&D/consulting* (5%) have positive signs. This indicates that firms with these functions tend to experience upgrade and innovation.

Table 4: Results of Estimations: Upgrading and Innovation.

		New goods		New method		New market		New supply	
		Full model	Selected model	Full model	Selected model	Full model	Selected model	Full model	Selected model
Q8)	1 incentives		+			**	**		
	2 Liberal trade policy		**	**	**			**	**
	3 Customs procedures		*			**	**		
	4 Local content requirements, rule of origin		[**]					[**]	[**]
	5 Physical infrastructure(roads, highways, ports,airports, etc.)		[**]	[*]	[*]			[*]	[+]
	6 Infrastructure(telecommunications, IT)			[**]	[**}	[**]	[**]	[+]	[**]
	7 Infrastructure (electricity,water supply, other utilities)			**	+	+	*		
	8 Government institutional infrastructure		[**]	*	*	*	**	*	*
	9 Financial system					[**]	[**]	[**]	[**]
	10 Legal system			[**]	[**]	[+]	[+]		[*]
	11 Protection of intellectual property rights		**			[**]	[**]		
	12 Size of local markets		[**]	**	**		[*]		
	13 Access to export markets						[+]	*	**
	14 Proximity to suppliers/subcontractors		*			+	+		
	15 Request by large/related company		[**]						
	16 Availability of low-cost labor		[*]						
	17 professionals								
	18 Other companies from the same country are located here (synergy)		**			+	[*]	*	*
	19 Access to cutting-edge technology and information				[+]	+	[*]		
	20 Living conditions					**	**		
Q6)	1 Retail/ Wholesale trade			**	*	**	**		+
	2 Production (raw-material processing)		*	+	+			**	**
	3 Production (components and parts)		**	**	+	**	**	+	*
	4 Production (final products)		**	**	**			**	**
	5 Purchasing/ Procurement/ Logistics					+	*		
	6 R&D/ Consulting			**	*	+	*		
	7 Human resources development			+	[+]				
Q1)	When did your company establish its first office?		[*]			+			
	_cons		**			[+]			
Obs		98	102	102	102	87	87	98	98
Log likelihood		0.000	-16.751	-47.121	-50.891	-18.444	-20.522	-41.994	-44.861
Pseudo R2		1.000	0.658	0.327	0.273	0.539	0.487	0.375	0.332

Note 1: [ ] indicates that the coefficient is negative, and items without [] imply the coefficient is positive.
Note 2: **, * and + indicates that coefficient is at the 5, 10 and 20 percent significance level, respectively.

The Selected Model identifies the following variables to have a positive sign: *Liberal trade policy* (5% significance level), *Infrastructure (electricity, water supply, other utilities)* (5%), *Government institutional infrastructure* (10%) and *Size of local markets (5%)*. These findings are exactly consistent with the Full Model, since *Infrastructure (electricity, water supply, other utilities)* is also positively significant at the 20 percent level. On the other hand, *Physical infrastructure (roads, highways, ports,*

airports, etc.) (10%), *Infrastructure (Telecommunications, IT)* (5%), and *Legal system (5%)* have negative signs. As for by functions of company, *Retail/wholesale trade* (5%) and *Production (components and parts)* (5%) are the same as the Full Model, but this estimate also includes *Puchasing/procurment/logistics* (10%) and *R&D/consulting (10%)* as variables with a positive relationship.

The industrial upgrade that allows one to adopt to the new market in Vietnam is supported by government initiatives such as liberal trade policies as well as enhanced by the size of the local market, but Vietnam's other infrastructure require further improvement.

3.2.3. Estimation of New Market Model

This section examines the model on the opening of a new market. According to Table 3, factors encouraging upgrade or innovation in Vietnam are *Investment incentives including tax incentives* (5%), *Government institutional infrastructure* (10%), and *Living conditions* (5%). On the other hand, variables such as *Infrastructure (Telecommunications, IT)* (5%), *Legal system* (5%), *Protection of intellectual property rights* (5%) have negative signs.

The Selected Model identifies the same variables as mentioned in the Full Model, and raises the significance level of *Government institutional infrastructure* from 10 percent to 5 percent, and *Infrastructure (electricity, water supply, other utilities)* from 20 percent to 10 percent. These two have positive signs. This model is inconsistent with the other model in the following variable: *Other companies from the same country are located here* and *Access to cutting-edge technology and information*. These two have different signs in two estimates.

 In sum, the two models on adoption of new technology have conclusions that coincide with each other and show good results in terms of significance. The industrial upgrade related to the opening of the new market in Vietnam is thus promoted by government initiatives such as investment subsidies, customs procedures and institutional infrastructures as well as living conditions, but Vietnam still has other infrastructure---such as those related to telecommunications, finance, intellectual property rights---that require improvement.

3.2.4. Estimation of New Input Model

Here, the model on the acquisition of a new source of input is examined. At first, the Full Model identifies the following factors with positive signs: *Liberal trade policy* (5%), *Government institutional infrastructure* (10%), *Access to export markets (10%)*, and *Other companies from the same country are located here* (10%). These factors encourage upgrades. On the other hand, *Local content requirement, rule of origin* (5%), *Physical infrastructure (roads, highways, ports, airports, etc.)* (10%), *Infrastructure (telecommunications, IT)* (20%) and *Financial systems* (5%) are found to have negative signs, which are thought to be obstacles to any upgrade. The company functions, *Production (raw-material processing)* (5%) and *Production (final products)* (5%) have positive signs.

In the Selected Model, almost all variables related to factors that attract business to Hanoi are the same as in the Full Model except *Legal systems* (10%), which is identified by the Selected Model. The Selected Model also raises significance levels of telecommunications and access to export markets. As for the function of companies, two variables must be mentioned, that is, Retail/wholesale trade becomes significant at a 20 percent level and production *(component and parts)* raises significance level from 20 to 10 percent.

The two models used here are found to have closely similar results with each other.

3.3. Summary of Econometric Analysis

Based on the above empirical analysis, the results of estimation conduced for Vietnam and the present policy issues for further agglomeration are summarized below:

Agglomeration

In terms of firm size, no clear conclusion can be found except that smaller firms are established at the early stage of agglomeration in terms of the number of employees. Vietnam's result is not consistent with that of the Flowchart Approach. The characteristics of agglomeration in Vietnam might be due to the fact that the rapid agglomeration started only recently---in the mid-1990s---and firms that set up business in Vietnam were of all sizes, making it difficult to identify the clear difference.

Except firm size, those factors that attract business to Vietnam (Question 8) and the

functions of companies (Question 6), show signs of significant variables that are consistent across the three models; in other words, no variables have contrasting signs in the three models of the definition of firm size as well as the Full and Selected Models. Factors related to the government policy such as *Customs procedures*, *Government institutional infrastructure*, and *Protection of intellectual property rights* are identified in three models as those with high significance levels. The former two have negative signs, which influence first movers, while the last one is positive and influences latecomers. *Access to cutting-edge technology* also has a positive sign and is found to be significant by the three models. Furthermore, *Availability of skilled labor and professionals* is identified by the assets and capital model as one to influence first movers. Another interesting point is found in inter-firms relationships or networks; namely, factors related to proximity, synergy, and request from large/related firms are not significant, according to the three models' findings. This connotes that the establishment of foreign firms is based on individual decisionmaking, which is different from what the Flowchart Approach suggests.

The agglomeration process in Vietnam can be describe as such: At the earlier stage of agglomeration, small firms producing raw materials and final products established in Vietnam, attracted by this nation's customs procedures, intuitional infrastructure, and living conditions. At the later stage, firms were attracted to the site by its physical infrastructure and the intellectual property rights system. Their decision set up business in Vietnam was independent of those of other firms.

Based on the above discussions, factors of agglomeration are now more clearly identified, which contrasts the results of other countries. However, other variables such as government policies on investment and foreign trades, infrastructure (physical, utilities, telecommunication, and legal system), inter-firms relationships (proximity to suppliers/subcontractors, request by other firms, and synergy), and targeting local as well as export markets are not identified in any of the three models. In other words, these are not effective variables for the agglomeration in Vietnam so far. To effectively encourage more foreign firms into the country, further effective policies are required.

Upgrade and Innovation

It is difficult to find common factors for industrial upgrade and innovation, since

key variables are not robust in all models. Some variables are significantly positive in one model, but are significantly negative in other models. It can be concluded from the estimation exercise that positive factors for upgrade are liberal trade policy, government institutional infrastructure. There are, however, many unsatisfactory factors identified, especially those related to physical as well as social infrastructure. Roads, highways, airports, telecommunications are typical examples of the former, while government institutional infrastructure, financial systems, legal systems, systems of intellectual property rights are related to the latter. The social infrastructure mentioned here is also essential for innovation.

In addition, the inter-firms relationships such as *Proximity to suppliers/subcontractors*, *Request by other firms*, *Other companies from the same countries are located here (synergy)*, and *Access to cutting-edge technology and information* are not identified clearly. The transfer of technology, know-how, and information are essential for industry upgrade and innovation, and this is achieved by networking with firms, research institutions, local governments in the regions they are located. To further the industrial upgrade and innovation, the framework and channel of information flows among firms in the regions are essential.

4. SUMMARY AND RECOMMENDATION

Based on the result of the case study and mail survey, the implications are as follows:

- Agglomeration on Hanoi/Vietnam existed spontaneously without the conscious intention of the central and local governments. Although Hanoi is not supposed to be an ideal environment to enterprises, it has been made more attractive by many "natural and historical" factors as location, market size, skilled labor and individual linkages between FDIs. Thus, it is necessary to make timely effort in order to meet enterprise's requirements.

- Vietnamese firms with no linkage with MNCs, larger firms, and universities in R&D activities find little benefits from the agglomeration. Supporting organizations and authorities need to create policies and programs so that

enterprises could participate in agglomeration, gradually forming clusters. Vietnam hardly exerts effort and supports policies to linkages. Legal system should approve inclusion of clauses on sub-contract law and on quality of semi-products.

- Skilled labor in Hanoi receives good reviews; however, low-cost labor does not meet the demand. Local economic development policies should pay attention to this kind of human resources since it is a social problem and related to industrial distribution.

- Continue initiating better studies on agglomeration. If industry-based agglomeration evaluation over the past 20 years is possible, such will help researchers to propose appropriate policies as well as supporting and effective programs for firms and the local economy.

Policy recommendations

- Focus on the HR development system, especially on gradual training of unskilled labor, and on foreign language ability of skilled labor

- Develop a practical and sustainable strategy for supporting industries

- Provide entrepreneurs the information on linkages

- Create a database on industrial subsectors (mechanic, plastic, molding) in Hanoi

- Focus on technology-intensive industries and build a master plan and strategy for developing regional and national industries

- Concentrate on BDS services in Hanoi as a tool for SME promotion

For international development organizations

- Further research and estimate agglomeration or concentration in areas in Hanoi

- Implement a pilot project to develop industrial clusters in Hanoi

- Build linkage-capacity programs (training courses, workshops) for the government, firms and nongovernmental organizations (NGOs)

- Ask NGOs, United Nations Industrial Organization (UNIDO), United Nations Development Program (UNDP) to help Vietnam in training cluster development agent (CDA), who conceptualizes the overall developmental strategy for a cluster and initiates implementation.

Issues for further research

- Accumulation, concentration and agglomeration can form clusters. It is suggested that cases on cluster creation should be evaluated. What is needed here is to select at least an emerging industry as a case study that can be continually reviewed.

NOTES

[i] The Flowchart Approach captures the nature of the East Asian model of agglomeration, which asserts that large MNCs are established first in special economic zones, for example, and then smaller firms follow to be near to them. This process eventually leads to industrial clusters.

[ii] Question 8 asks respondents' degree of satisfaction. Accordingly, it does not directly relate to factors of upgrade and innovation. It can be interpreted, however, since the dependent variable is whether they experienced an upgrade or not. Firms with affirmative replies to factors are considered to be promoting or supporting upgrade and innovation.

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APPENDIX

Here, detailed results of estimation are presented. Table A1 and A2 show those for agglomeration, and Table A3 and A4 for upgrading and innovation.

Table A1: Estimation of Agglomeration (Vietnam): Full Model

		Full-time Employees		Total Assets		Paid-UP Capital	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Q3)	2) 50-99persons/10,000-24,999(US$)/10,000-24,999 (US$)	-3.316	-3.220 **	0.330	0.310	-0.534	-0.480
	3) 100 - 199/25,000-49,999/25,000-49,999	-1.125	-1.040	-1.470	-1.260	0.055	0.050
	4) 200 - 299/50,000-74,999/50,000-74,999	0.737	0.470	-0.076	-0.070	0.315	0.270
	5) 300 - 399/75,000-99,999/75,000-99,999	-6.458	-3.650 **	2.694	1.960 **	2.030	1.430 +
	6) 400 - 499/100,000-499,999/100,000-499,999	0.831	0.510	-1.925	-1.490 +	-0.497	-0.480
	7) 500 - 999/500,000-999,999/500,000-999,999	-1.256	-0.660	-0.548	-0.420	0.589	0.450
	8) 1,000 - 1,499/1 M-4.9M/1M-4.9M	37.286	0.000	1.157	0.960	0.777	0.680
	9) 1,500 - 1,999/5M-9.9 M/5M-9.9M		0.000	0.889	0.540	1.830	1.210
	10) 2,000 & above/10M & above/10M & above	38.821	0.900	1.748	0.780	1.915	0.930
Q7)	1) Investment incentives including tax incentives	0.285	0.890	0.267	0.880	0.136	0.450
	2) Liberal trade policy	0.308	-2.060	0.325	0.940	0.220	0.680
	3) Customs procedures	-0.607	-0.250 **	-0.978	-2.890 **	-0.640	-2.370 **
	4) Local content requirements, rule of origin	-0.093	2.450	0.367	0.920	0.111	0.300
	5) Physical infrastructure (roads, highways, ports, airports, etc.)	0.850	-0.530 *	0.479	1.420 +	0.465	1.170
	6) Infrastructure (telecommunications, IT)	-0.272	-0.760	0.417	0.910	0.381	0.880
	7) Infrastructure (electricity, water supply, other utilities)	-0.301	-1.310	-0.864	-1.980 **	-0.507	-1.210
	8) Government institutional infrastructure	-0.531	0.000 +	-1.258	-2.820 **	-0.953	-2.430 **
	9) Financial system	0.000	0.180	0.802	1.650 *	0.391	0.940
	10) Legal system	0.085	2.060	-0.024	-0.050	0.136	0.300
	11) Protection of intellectual property rights	0.815	-0.160 **	0.888	2.180 **	0.544	1.460 +
	12) Size of local markets	-0.053	-0.040	-0.423	-1.300 +	-0.328	-1.060
	13) Access to export markets	-0.012	-0.650	-0.110	-0.420	0.002	0.010
	14) Proximity to suppliers/subcontractors	-0.221	-0.200	-0.451	-1.230	-0.181	-0.570
	15) Request by large/related company	-0.054	0.720	0.249	0.910	0.218	0.840
	16) Availability of low-cost labor	0.207	-0.490	0.305	1.080	0.225	0.810
	17) Availability of skilled labor and professionals	-0.198	1.030	-0.862	-2.000 **	-0.680	-1.740 *
	18) Other companies from the same country are located here (synergy)	0.328	1.720	0.322	0.960	0.231	0.680
	19) Access to cutting-edge technology and information	0.988	-1.370 *	1.138	1.840 *	0.767	1.450 +
	20) Living conditions	-0.619	0.110 +	-0.616	-1.320 +	-0.154	-0.400
Q6)	1) Retail/ Wholesale trade	0.071	-1.170	0.118	0.190	-0.077	-0.130
	2) Production (raw-material processing)	-1.178	-0.970	-1.387	-1.510 +	-1.430	-1.560 +
	3) Production (components and parts)	-0.900	-0.940	0.426	0.500	-0.221	-0.270
	4) Production (final products)	-0.751	-0.250	-0.981	-1.310 +	-1.109	-1.490 +
	5) Purchasing/ Procurement/ Logistics	-0.401	0.060	-1.148	-0.650	-0.208	-0.130
	6) R&D/ Consulting	0.039	0.070	0.224	0.330	0.338	0.510
	7) Human resources development	0.078		-0.743	-0.630	-0.129	-0.110
	/cut1	-2.466		-4.502		-2.603	
	/cut2	2.200		-0.746		1.089	
Nob		102		102		102	
Log likelihood		-56.846		-64.059		-67.423	
Pseudo R2		0.360		0.279		0.024	

Note: **, * and + indicates that coefficient is at the 5, 10 and 20% significance level, respectively.

Table A2: Estimation of Agglomeration (Vietnam): Selected Model

		Full-time Employees		Total Assets		Paid-UP Capital	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Q3)	2) 50-99persons/10,000-24,999(US$)/10,000-24,999 (US$)	-2.992	-3.610 **				
	3) 100 - 199/25,000-49,999/25,000-49,999	-1.607	-1.980 **	-1.736	-2.230 **		
	4) 200 - 299/50,000-74,999/50,000-74,999						
	5) 300 - 399/75,000-99,999/75,000-99,999	-6.510	-4.180 **	1.288	1.400 +	1.251	1.400 +
	6) 400 - 499/100,000-499,999/100,000-499,999			-1.227	-1.650 +		
	7) 500 - 999/500,000-999,999/500,000-999,999						
	8) 1,000 - 1,499/1 M-4.9M/1M-4.9M						
	9) 1,500 - 1,999/5M-9.9 M/5M-9.9M						
	10) 2,000 & above/10M & above/10M & above						
Q7)	1) Investment incentives including tax incentives						
	2) Liberal trade policy			0.401	1.520 +		
	3) Customs procedures	-0.292	-1.350 +	-0.401	-1.980 **		
	4) Local content requirements, rule of origin						
	5) Physical infrastructure (roads, highways, ports, airports, etc.)	0.661	2.580 **				
	6) Infrastructure (telecommunications, IT)						
	7) Infrastructure (electricity, water supply, other utilities)						
	8) Government institutional infrastructure	-0.482	-1.880 *	-0.714	-2.810 **	-0.451	-2.060 **
	9) Financial system						
	10) Legal system						
	11) Protection of intellectual property rights	0.743	2.730 **	0.786	3.490 **	0.401	1.810 *
	12) Size of local markets						
	13) Access to export markets						
	14) Proximity to suppliers/subcontractors						
	15) Request by large/related company						
	16) Availability of low-cost labor						
	17) Availability of skilled labor and professionals						
	18) Other companies from the same country are located here (synergy)						
	19) Access to cutting-edge technology and information	0.781	2.160 **			0.531	2.180 **
	20) Living conditions	-0.504	-1.450 +				
Q6)	1) Retail/ Wholesale trade						
	2) Production (raw-material processing)			-1.492	-1.960 *	-1.124	-1.460 +
	3) Production (components and parts)						
	4) Production (final products)			-0.929	-1.890 *		
	5) Purchasing/ Procurement/ Logistics						
	6) R&D/ Consulting						
	7) Human resources development						
	/cut1	-3.391		-3.661		-1.270	
	/cut2	-0.692		-0.289		1.966	
Nob		102		102		102	
Log likelihood		-62.216		-73.069		-76.743	
Pseudo R2		0.300		0.178		0.136	

Note: **, * and + indicates that coefficient is at the 5, 10 and 20% significance level, respectively.

Table A3: Results of Industrial Upgrading and Innovation (Vietnam): Full Model

		New goods		New method		New market		New supply	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Q8)	1) Investment incentives including tax incentives	354.545	0.030	-0.614	-1.110	5.273	2.490 **	-0.276	-0.430
	2) Liberal trade policy	423.935	0.040	1.623	2.560 **	-1.275	-0.990	1.387	2.040 **
	3) Customs procedures	145.581	0.050	0.261	0.530	3.591	2.120 **	0.170	0.300
	4) Local content requirements, rule of origin	-390.750	-0.030	-0.171	-0.430	0.000	0.000	-0.982	-2.070 **
	5) Physical infrastructure (roads, highways, ports, airports, etc.)	-375.797	-0.050	-0.901	-1.900 *	0.205	0.200	-0.983	-1.720 *
	6) Infrastructure (telecommunications, IT)	-255.196	-0.020	-1.690	-2.600 **	-4.722	-2.210 **	-0.995	-1.580 +
	7) Infrastructure (electricity, water supply, other utilities)	98.683	0.010	1.390	2.240 **	2.136	1.570 +	-0.202	-0.330
	8) Government institutional infrastructure	-95.976	-0.020	1.017	1.710 *	3.109	1.840 *	1.404	1.960 *
	9) Financial system	-173.849	-0.040	-0.588	-1.030	-3.093	-2.080 **	-1.658	-2.410 **
	10) Legal system	-525.951	-0.060	-1.229	-2.170 **	-1.876	-1.560 +	-0.727	-1.230
	11) Protection of intellectual property rights	306.490	0.050	-0.146	-0.350	-2.497	-2.040 **	-0.180	-0.390
	12) Size of local markets	-445.042	-0.030	1.325	2.510 **	-1.618	-1.080	0.619	1.210
	13) Access to export markets	-85.275	-0.020	-0.392	-0.730	-1.143	-0.920	1.204	1.920 *
	14) Proximity to suppliers/subcontractors	53.241	0.000	0.049	0.100	1.716	1.610 +	-0.149	-0.310
	15) Request by large/related company	-418.726	-0.050	0.371	0.870	-0.693	-0.720	-0.265	-0.530
	16) Availability of low-cost labor	-215.119	-0.050	-0.301	-0.910	-0.550	-0.760	0.040	0.110
	17) Availability of skilled labor and professionals	63.387	0.000	-0.127	-0.300	-0.586	-0.670	-0.319	-0.710
	18) Other companies from the same country are located here (synergy)	336.256	0.030	-0.463	-0.910	-2.377	-1.560 +	1.227	1.950 *
	19) Access to cutting-edge technology and information	92.347	0.020	-0.626	-1.260	-2.180	-1.630 +	-0.224	-0.450
	20) Living conditions	173.139	0.010	0.187	0.350	4.845	2.360 **	0.535	0.850
Q6)	1) Retail/ Wholesale trade	-1.235	0.000	1.649	2.190 **	4.715	2.060 **	0.991	1.230
	2) Production (raw-material processing)	339.394	0.020	1.965	1.510 +			5.489	2.880 **
	3) Production (components and parts)	276.076	0.040	1.879	1.980 **	9.141	2.230 **	1.279	1.280 +
	4) Production (final products)	720.702	0.040	3.763	3.260 **	0.467	0.260	2.560	2.340 **
	5) Purchasing/ Procurement/ Logistics	234.371	0.030	-2.379	-1.190	5.006	1.460 +		
	6) R&D/ Consulting	-210.101	-0.020	1.822	2.040 **	3.020	1.580 +	-0.129	-0.140
	7) Human resources development	-20.850	-0.080	-1.934	-1.350 +			-1.988	-1.170
Q1)	When did your company establish its first office?	45337.080	0.080	-0.007	-0.200	0.116	1.360 +	0.024	0.640
	constant	327.359	2.040	15.964	0.210	-222.391	-1.310 +	-47.808	-0.640
Nob		98		102		87		98	
Log likelihood		0.000		-47.121		-18.444		-41.994	
Pseudo R2		1.000		0.327		0.539		0.375	

Note: ** , * and + indicates that coefficient is at the 5, 10 and 20% significance level, respectively.

Table A4: Results of Industrial Upgrading and Innovation (Vietnam): Selected Model

		New goods		New method		New market		New supply	
		Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Q8)	1) Investment incentives including tax incentives	2.435	1.490 +			4.066	2.440 **		
	2) Liberal trade policy	4.979	2.590 **	0.862	2.110 **	2.618	2.320 **	1.036	2.290 **
	3) Customs procedures	2.383	2.140 *						
	4) Local content requirements, rule of origin	-6.785	-2.420 **					-0.817	-2.000 **
	5) Physical infrastructure (roads, highways, ports, airports, etc.)	-2.771	-2.490 **	-0.638	-1.820 *	-3.554	-2.350 **	-0.604	-1.540 +
	6) Infrastructure (telecommunications, IT)			-1.217	-2.490 **	2.035	1.780 *	-0.982	-2.000 **
	7) Infrastructure (electricity, water supply, other utilities)			0.693	1.430 +			1.124	1.860 *
	8) Government institutional infrastructure	-4.186	-2.030 **	0.889	1.840 *	3.240	2.350 **		
	9) Financial system					-2.716	-2.270 **	-1.351	-2.440 **
	10) Legal system			-1.392	-3.140 **	-1.515	-1.570 +	-0.906	-2.050 *
	11) Protection of intellectual property rights	2.417	2.230 **			-2.359	-2.180 **		
	12) Size of local markets	-6.447	-2.460 **	1.052	2.550 **	-1.953	-1.700 *		
	13) Access to export markets					-1.559	-1.430 +	1.183	2.850 **
	14) Proximity to suppliers/subcontractors	2.477	1.650 *			1.108	1.310 +		
	15) Request by large/related company	-4.201	-2.260 **						
	16) Availability of low-cost labor	-1.338	-1.700 *						
	17) Availability of skilled labor and professionals								
	18) Other companies from the same country are located here (synergy)	4.514	2.370 **	-0.520	-1.470 +	-1.991	-1.900 *	0.953	1.910 *
	19) Access to cutting-edge technology and information					-1.649	-1.730 *		
	20) Living conditions					3.929	2.430 **		
Q6)	1) Retail/ Wholesale trade			0.962	1.650 *	2.748	2.330 **	0.842	1.450 +
	2) Production (raw-material processing)	6.253	1.930 *	1.349	1.380 +			4.503	2.780 **
	3) Production (components and parts)	5.745	2.350 **	0.910	1.310 +	6.255	2.360 **	1.063	1.680 *
	4) Production (final products)	7.705	2.820 **	2.718	3.450 **			2.531	3.180 **
	5) Purchasing/ Procurement/ Logistics			1.318	1.820 *	4.798	1.720 *		
	6) R&D/ Consulting			-1.866	-1.430 +	2.114	1.850 *		
	7) Human resources development								
Q1)	When did your company establish its first office?	-0.150	-1.960 *						
	constant	327.359	2.040 **	-0.474	-0.250	5.864	1.210	0.050	0.020
Nob		102		102		87		98	
Log likelihood		-16.751		-50.891		-20.522		-44.861	
Pseudo R2		0.658		0.273		0.487		0.332	

Note: **, * and + indicates that coefficient is at the 5, 10 and 20% significance level, respectively.