Location choice in low-income countries : evidence from Japanese investments in East Asia

INSTITUTE OF DEVELOPING ECONOMIES

IDE Discussion Papers are preliminary materials circulated
to stimulate discussions and critical comments

IDE DISCUSSION PAPER No. 301

Location Choice in Low-income Countries: Evidence from Japanese Investments in East Asia

Kazunobu HAYAKAWA*
and Kenmei TSUBOTA**

July 2011

Abstract

Unlike most existing studies, this paper examines the location choices of MNEs in developing countries. Specifically, we investigate the location choices of Japanese MNEs among East Asian developing countries by estimating a four-stage nested logit model at the province level. Noteworthy results of location elements are as follows. As is consistent with the mechanics of cheap labor-seeking FDI, Japanese MNEs are more likely to invest in locations with low income and low tariff rates on products from Japan. Also, accessibility to other locations and/or ports matters in attracting Japanese MNEs because it is crucial in importing materials and exporting their products. In addition, WTO membership and bilateral investment treaties are important because these contribute to the settlement of trade and investment disputes, which is more likely to be necessary in developing countries.

Keywords: Location Choice, Multinational Firms, Nested-logit Model
JEL Classification: F15; F23

---

* Corresponding author: Bangkok Research Center, Japan External Trade Organization, Thailand, (kazunobu_hayakawa@ide-jetro.org.)
** Inter-disciplinary Studies Center, Institute of Developing Economies, Japan External Trade Organization, Japan (tsubota@ide.go.jp)

The Institute of Developing Economies (IDE) is a semigovernmental, nonpartisan, nonprofit research institute, founded in 1958. The Institute merged with the Japan External Trade Organization (JETRO) on July 1, 1998. The Institute conducts basic and comprehensive studies on economic and related affairs in all developing countries and regions, including Asia, the Middle East, Africa, Latin America, Oceania, and Eastern Europe.

INSTITUTE OF DEVELOPING ECONOMIES (IDE), JETRO
3-2-2, WAKABA, MIHAMA-KU, CHIBA-SHI
CHIBA 261-8545, JAPAN

Location Choice in Low-income Countries: Evidence from Japanese Investments in East Asia

Kazunobu HAYAKAWA[#§]
Bangkok Research Center, Japan External Trade Organization, Thailand

Kenmei TSUBOTA
Institute of Developing Economies, Japan External Trade Organization, Japan

Abstract: Unlike most existing studies, this paper examines the location choices of MNEs in developing countries. Specifically, we investigate the location choices of Japanese MNEs among East Asian developing countries by estimating a four-stage nested logit model at the province level. Noteworthy results of location elements are as follows. As is consistent with the mechanics of cheap labor-seeking FDI, Japanese MNEs are more likely to invest in locations with low income and low tariff rates on products from Japan. Also, accessibility to other locations and/or ports matters in attracting Japanese MNEs because it is crucial in importing materials and exporting their products. In addition, WTO membership and bilateral investment treaties are important because these contribute to the settlement of trade and investment disputes, which is more likely to be necessary in developing countries.

***Keywords*:** Location Choice, Multinational Firms, Nested-logit Model
***JEL Classification*:** F15; F23

[#] Corresponding author: Kazunobu Hayakawa; Address: Bangkok Center, Japan External Trade Organization, 16th Floor, Nantawan Building, 161 Rajadamri Road, Pathumwan, Bangkok 10330, Thailand; Tel: 66-2-253-6441; Fax: 66-2-254-1447; E-mail: kazunobu_hayakawa@ide-jetro.org.
[§] We would like to thank Naomi Hatsukano, Futaba Ishizuka, Souknilanh Keola, Toshihiro Kudo, and Shozo Sakata for their help in our collection of province-level data. We also thank Satoru Kumagai and Ikuo Kuroiwa for their helpful comments.

1. Introduction

The emergence of China has forced other developing countries to contend with the threat of a concentration of multinational enterprises (MNEs) in China. China has attracted a vast volume of foreign direct investment (FDI). Since 1979, the country has attracted foreign firms as part of her export promotion policy and since 1990, the increase in inward FDI has been remarkable. In particular, it expanded rapidly after Xiao-Ping Deng's "Southern Tour Speech" in 1992. Furthermore, the rate of its increase seems to have been steadier since the country joined the World Trade Organization (WTO). As a result, in 2008, according to FDISTAT (UNCTAD), the inward FDI stock is ranked 1st among developing countries (10th in the world). Because of this large inward FDI in China, policy makers in developing countries, particularly ASEAN countries, have been concerned about the decrease in inward FDI in these countries due to it being replaced with FDI in China. In short, China has been perceived as a potential absorber of the world's FDI to developing countries.

In the academic field, there are a large number of studies investigating in what kinds of countries MNEs locate.[1] This is a well-known location choice analysis. In this literature, there are two main topics. The first topic examines various kinds of location factor such as the agglomeration of firms belonging to the same firm group (e.g., Belderbos and Carree, 2002) or investment climate-related elements (free trade zones in the US, Head et al., 1999; special economic zones and opening coastal cities in China, Belderbos and Carree, 2002; Objective 1 structural funds and cohesion funds in Europe, Basile et al., 2008). The second topic explores the substitution of location by examining inclusive values in the nested logit model: Basile, Castellani, and Zanfei (2009); Disdier and Mayer (2004); Mayer et al. (2010). For instance, Disdier and Mayer (2004) investigate whether French multinational firms consider Western Europe and Eastern Europe to be two distinct groups of potential host countries by examining the coefficient for the inclusive value in nested logit estimation. They confirm the differentiation between Eastern Europe and Western Europe in their country location decision and furthermore show that this relevance decreases.

This paper investigates the location choice of Japanese MNEs in East Asian developing countries[2] and shows three notable points compared with existing studies.

[1] Recent references are as follows: Head, Ries, and Swenson (1999) for Japanese MNEs in the US; Belderbos and Carree (2002) for Japanese MNEs in China; Head and Mayer (2004) for Japanese MNEs in Europe; Disdier and Mayer (2004) for French MNEs in Europe; Castellani and Zanfei (2004) for large MNEs in the world; Mayer, Mejean, and Nefussi (2007) for French MNEs in the world; Crozet, Mayer, and Mucchielli (2004) for MNEs in France; and Basile, Castellani, and Zanfei (2008) for MNEs in Europe.

[2] They include China, Cambodia, Laos, Myanmar, Vietnam, the Philippines, Thailand, Malaysia,

First, our paper investigates the location choice of MNEs with different FDI motivation from previous studies. Most existing studies examine the location choices of MNEs among developed countries, particularly European countries. In this sense, existing studies examine the location choice in the case of market-seeking FDI (or horizontal FDI). On the other hand, our sample host countries consist of developing countries with widely different levels of economic development. For example, even the poorest host country in Disdier and Mayer (2004), Bulgaria (3,513 US$), in terms of GDP per capita in 2005 has a middling income between the richest and second-richest host countries in this paper, Malaysia (5,329 US$) and Thailand (2,797 US$), respectively. Also, some countries including Cambodia and Laos have an income of less than 500 US$. Thus, for investors from Japan, which has an income of 35,603 US$, FDIs in such host countries should mostly be motivated by their cheap labor.[3] In other words, contrast to existing studies, our paper tries to investigate the location choice of MNEs in the case of cheap labor-seeking FDI (or vertical FDI) rather than that in the case of market-seeking FDI.

Second, in spite of our focus on developing countries, our examination of location choice is conducted at the sub-national level, not the national level. There seem to be more relevant differences not only across countries but also across provinces within a nation in less developed countries than in advanced countries. Mostly, only capital cities are rich in developing countries in terms of income, infrastructure, and so on. Indeed, policies for enhancing economic development are sometimes conducted selectively or gradually in terms of regional coverage. For example, the target provinces of the open-door policy were originally concentrated in the coastal region of China. Thus, a sub-national-level analysis is crucially important in examining location choice among less developed countries. However, it is much more difficult to collect sub-national-level data in less developed countries. Such data are not available in a ready-made format, unlike the case of European countries, i.e., EUROSTAT. Thus, to the best of our knowledge, our study is also the first to analyze the location choice of MNEs among developing countries at the sub-national level. Such an analysis will enable us to uncover relevant location characteristics in detail.

Third, as in the second topic in the location choice literature, we seek the appropriate nesting structure of the location choices of Japanese MNEs in East Asian countries, i.e., their substitution patterns among these countries. For example, we

---

and Indonesia.

[3] The numbers presented in this paragraph are drawn from the World Development Indicators Online.

intend to investigate empirically whether Japanese MNEs consider China and ASEAN countries to be two distinct groups of potential host countries by examining the inclusive value parameters in the nested logit estimation. This analysis is expected to give us some insight into the above-mentioned policy makers' concern regarding whether or not, for foreign investors, China is substitute for or complement to ASEAN countries. In particular, unlike existing studies, we estimate the higher stage of nesting structures, i.e., three- or four-stage nested logit models. Such models allow us not only to capture less restrictive substitution patterns among choices than the standard conditional/two-stage nested logit model but also to clarify MNEs' perception of more detailed location substitution patterns among East Asian developing countries.[4]

Under this framework, we investigate the location choice of MNEs in the case of cheap labor-seeking FDI. For an analysis of this type of FDI, this paper sheds light on location elements that previous studies in the case of market-seeking FDI may have not explored intensively. These elements are the host country's tariff rates on products from the investing country, the existence of well-paved highways, and the existence of airports/seaports. Since cheap labor-seeking FDI aims to conduct a production process-wise vertical division of labor between the host and the home country, broadly defined trade costs between these two countries are crucially important in the case of this type of FDI. Therefore, these elements relating to trade costs are expected to play an essential role in attracting Japanese FDI to East Asian developing countries. Also, the roles of WTO membership and bilateral investment treaties are examined, which will contribute to settling trade and investment disputes in host countries. These roles will be relevant particularly in the case of FDI in developing countries because these countries have various relatively high country risks compared with developed countries.

The rest of this paper is organized as follows. Section 2 explains the nested logit model for our analysis. Section 3 provides the details of our empirical model, namely location elements. After reporting our data sources in Section 4, we present the estimation results in Section 5. Last, we conclude our paper in Section 6.

2. Nested logit Model

We examine what location characteristics matter in the sub-national-level location

[4] Basile et al. (2008) estimate the mixed logit model, which may capture less restrictive substitution patterns among choices than our three/four-stage nested logit models. However, our primary interest lies in the results of these nested logit models to provide some answers to the above-mentioned policy makers' concerns.

choice of MNEs in East Asian developing countries during the period 1996-2006. Specifically, we choose the province level as a sub-national level. Then, the discrete choice model of MNE investment is estimated. The use of a discrete choice model seems to be more appropriate in our case than in the case of other studies, i.e., the analysis of location choices of MNEs among developed countries. A discrete choice model is one in which agents such as firms choose the alternative with the highest utility or profit. In the case of market-seeking FDI/horizontal FDI, firms are often assumed to make a decision on whether to invest or export for *each* alternative (see, for example, Yeaple, 2009). On the other hand, "the purest form of vertical FDI is a model in which a multinational firm evaluates all potential destination markets to find the one that is the lowest-cost provider of the activity it wishes to relocate" (Blonigen et al., 2007). In short, when analyzing vertical FDI, the assumption underlying the theoretical model is more consistent with the setting of the discrete choice model. In order to take similarity among provinces within the same nation into account, we employ the nested logit model.

The familiar two-stage nested logit model is as follows. Now assume that we have N firms in our sample. Let set of alternatives j be partitioned into K non-overlapping subsets denoted G_1, G_2,…, G_K and are called nests. For firm n faced with J alternatives (province), suppose that a random profit indicator of province j in nest G_k is:

$$\pi_{nj} = V_{nj} + \epsilon_{nj}, \qquad \text{where } V_{nj} \equiv \boldsymbol{x}_{nj}\boldsymbol{\beta}.$$

V is the nonstochastic representative profit, which varies over alternatives with a nest. $\boldsymbol{x}_{nj}$ is a vector of variables that describe alternative j, and $\boldsymbol{\beta}$ is a vector of parameters to be estimated. ε varies randomly and is assumed to follow the generalized extreme value (GEV) distribution, which has the following cumulative distribution:

$$\exp\left[-\sum_{k=1}^{K}\left(\sum_{j\in G_k}\exp\left(\frac{-\epsilon_{nj}}{\tau_k}\right)\right)^{\tau_k}\right].$$

Parameter τ_k measures the degree of independence in unobserved utility among the alternatives in nest k and is called a dissimilarity parameter or an inclusive value parameter (an IV parameter).

Under this setting, it is shown that the probability of choosing alternative $j \in G_k$is expressed as (for more details of derivation, see Train, 2003):

$$P_{nj} = P_{nj|G_k}P_{nG_k},$$

where

$$P_{nj|G_k} = \frac{\exp\left(V_{nj}/\tau_k\right)}{\sum_{j\in G_k}\exp\left(V_{nj}/\tau_k\right)} \qquad \text{and} \qquad P_{nG_k} = \frac{\exp(\tau_k I_{nk})}{\sum_{l=1}^{K}\exp(\tau_l I_{nl})}.$$

I_{nk} is called the inclusive value for the kth subset and is defined as:

$$I_{nk} \equiv \ln \sum_{j \in G_k} \exp\left(V_{nj}/\tau_k\right).$$

Assuming that each firm's choice is independent of that of other firms, the log-likelihood function to be maximized is given by:

$$LL(\boldsymbol{\beta}) = \sum_{n=1}^{N} \sum_{k=1}^{K} \sum_{j \in G_k} y_{nj} \ln P_{nj},$$

where y_{nj} is a binary variable indicating the choice made by firm n so that for each n, only one y_{nj} is 1 and the rest are 0 for all j.

It is well known that in the conditional logit model (or the multinomial logit model), the odds ratio, P_{ni}/P_{nj}, does not depend on the other alternatives. This property is called "independence from irrelevant alternatives (IIA)." The inclusion of IV parameters in the nested logit model allows us to incorporate some degree of heteroscedasticity. Only within each subset does the IIA restriction continue to hold. A sufficient condition for global consistency with the random utility model (RUM) is that the IV parameter lies between 0 and 1. When $\tau_k = 1$ for all k, indicating no correlation among the unobserved elements with each nest, this model can be reduced to the simple conditional logit model.[5]

This two-stage nested logit model can be easily extended to a higher-stage nested logit model. For example, in the case of the three-stage model, we further assume that each subset G_k can be partitioned into M_k non-overlapping sets denoted g_{k1}, g_{k2},…, g_{kMk}. Then, the following cumulative distribution is assumed for random term ε:

$$\exp\left[-\sum_{k=1}^{K}\left\{\sum_{m=1}^{M_k}\left(\sum_{j \in g_{km}} \exp\left(\frac{-\epsilon_{nj}}{\tau_m}\right)\right)^{\tau_m/\nu_k}\right\}^{\nu_k}\right].$$

υ_k is again a dissimilarity parameter. The probability of choosing an alternative is expressed as:

$$P_{nj} = P_{nj|g_{km},G_k} P_{g_{km}|G_k} P_{nG_k},$$

where

$$P_{nj|g_{km},G_k} = \frac{\exp\left(V_{nj}/\tau_m\right)}{\sum_{j \in g_{km}} \exp\left(V_{nj}/\tau_m\right)}, \qquad P_{g_{km}|G_k} = \frac{\exp\left(\frac{\tau_m}{\nu_k} I_{nm}\right)}{\sum_{l=1}^{M_k} \exp\left(\frac{\tau_l}{\nu_k} I_{nl}\right)},$$

$$P_{nG_k} = \frac{\exp(\nu_k J_{nk})}{\sum_{l=1}^{K} \exp(\nu_l J_{nl})},$$

[5] For simplicity, this paper assumes the common IV parameters among nests.

$$I_{nm} \equiv \ln \sum_{j \in g_{km}} \exp\left(V_{nj}/\tau_m\right), \qquad J_{nk} \equiv \ln \sum_{m=1}^{M_k} \exp\left(\frac{\tau_m}{\nu_k} I_{nm}\right).$$

The extension of the model to higher than three levels is also feasible, though we do not show it because of the cumbersome notation.

3. Location Elements

This section specifies our profit function. It should be based on the model that describes the mechanics of cheap labor-seeking FDI. Well-known references for such a model include Arndt and Kierzkowski (2001), Feenstra and Hanson (1996), and Helpman (1984). Even if we assume any kind of model, the profit function will include the same kind of elements as in the case of market-seeking FDI though the functional form for each element differs according to the assumed model: demand size, primary production factor prices, prices of intermediate goods, trade costs with the home country, and fixed entry costs. In the following, we explain the proxies for these variables that we use for our estimation. But notice that our sub-national-level analysis in the case of developing countries prevents us from introducing certain location elements included in previous studies, e.g., education level of laborers, due to lack of data availability.

The market size is captured by introducing the distance-weighted sum of the gross regional domestic product (GRDP), which is constructed at the province level. This measure is called market potential and is known to work just as well as sophisticated measures that take the price index into account, from an empirical point of view (Head and Mayer, 2004). The literature on cheap labor-seeking FDI does not shed central light on the role of market size. For example, it is noted that the surrounding market potential should be insignificant in a well-specified model of a vertical form of FDI, since the output of the subsidiary is simply shipped back to the parent country (Blonigen et al. 2007). However, from an empirical point of view, the market size may still have a positive influence in attracting ethe host economy. To capture the market size in not only the province concerned but also its surrounding provinces, we introduce the distance-weighted sum of all provinces' GRDP in our sample.

The lower the wages in a province, the more an MNE is likely to invest in it. In general, other things being equal, lower wages lead to lower production costs, cheaper product prices, and greater supply of products. As a result, since firms in provinces with lower wages obtain higher total profit, they are more likely to choose to locate in

provinces with lower wages. In particular, in the case of cheap labor-seeking FDI, wages should be one of the most important location choice elements. As a proxy for wages, we simply use GRDP per capita in each province because direct data on labors' wages are not available for our sample countries. However, GRDP per capita may also be related to the magnitude of fixed entry costs because it also serves as a proxy for the extent of socio-economic development. Thus, the coefficient for GRDP might be positive or negative in our model.

As usual, data on price indexes for intermediate goods are unavailable. In this paper, we use the variable reflecting the magnitude of agglomeration as a proxy for that ("Agglomeration"). Since from the theoretical point of view the price index for intermediate goods is low in provinces with such large agglomeration, this proxy seems to be plausible. Specifically, we introduce the number of Japanese affiliates at the province level because Japanese MNEs procure a significant share of inputs from other Japanese MNEs. However, the use of this measure cannot again differentiate between two location elements, as in the case of GRDP per capita. The uncertainty of the market and operation environment is lower in provinces in which a larger number of Japanese firms already exist because new investors may be able to get this kind of information from existing firms. In other words, it will be also related to the magnitude of fixed entry costs. In any of these cases, we expect a positive coefficient.

The proxy variables for trade costs are "Distance from Japan" and "Tariff Rates in the Host." The "Distance from Japan" variable is constructed on a sub-national basis. This variable is expected to capture the physical transportation charge for intermediate goods from Japan to the host province and to have a negative coefficient. However, geographical distance from Japan is also partly associated with information costs between MNEs' headquarters and their overseas plants. That is, a shorter geographical distance between them results in lower fixed entry costs because of the greater knowledge and the lower uncertainty about the host economy and of the more frequent information exchange between home and overseas plants. Again, in any of these cases, we expect a negative coefficient.

The "Tariff Rates in the Host" variable is a country-level (and sectoral) variable and the host country's tariff rates on products from the home country, namely Japan. This variable is again one of the most important elements in the case of cheap labor-seeking FDI and should have a negative coefficient, unlike the case of market-seeking FDI. This is the location element that shows sharp contrast between market-seeking and cheap labor-seeking FDIs. Since market-seeking FDI has the motivation of so-called tariff jumping, the host economy's tariff rates are expected to

have a positive impact on the location choice of MNEs. On the other hand, cheap labor-seeking FDI is motivated to engage in production process-wise vertical division of labor between the host and home countries. Thus, lower tariff rates in the host country enable potential MNEs to import their materials/inputs more cheaply from home and thus encourage them to invest in that country. As a result, the "Tariff Rates in the Host" variable is expected to have a negative coefficient.

The proxy variables for fixed entry costs are two country-level variables: "WTO" and "BIT." "WTO" is a dummy variable taking unity if a province is a WTO member country and zero otherwise. One of the major roles of the WTO is the multilateral reduction of tariff rates. As argued above, this role is already controlled by including bilateral tariff rates in products from Japan. However, WTO membership still plays certain roles including the settlement of trade disputes, which plays a role in reducing fixed entry costs and thus encouraging MNE investment. The "BIT" variable is a dummy variable, which takes unity if the host country concludes a bilateral investment treaty with Japan and zero otherwise. Its conclusion contributes to improving the investment environment and to settling investment-related disputes in the host country, resulting in an increase in Japanese FDI to that country.

We include two further kinds of infrastructure-related variables at the province level. One is the dummy variable "Seaports/Airports," which takes unity if a province has major seaports or airports. The other variable controls for accessibility to highways. "Asian Highway 1-digit" and "Asian Highway 2-digit" are dummy variables indicating unity if a province has 1-digit and 2-digit Asian highways, respectively. These variables are related to various kinds of elements. First, although our measure of market size adjusts transaction costs with other provinces using geographical distance, it also matters whether or not the province concerned has good accessibility to ports and/or well-paved highways. In this sense, introducing these infrastructure variables is expected to improve the incompleteness of our market potential measure in terms of controlling transaction costs with other provinces. Second, these variables also reflect some of the accessibility to foreign countries, particularly Japan, and are thus strongly related to trade costs with the home country. Not only airports/seaports but also highways are important because the existence of highways is key to accessing these ports. Particularly for importing materials and exporting products, these variables play a crucial role in the case of cheap labor-seeking FDI.

4. Data Issues

In this section, we report our data sources and then present an overview of Japanese MNEs in East Asian countries. We examine the entry of Japanese MNEs in the aforementioned nine countries during 1996-2006: China, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, and Vietnam. A list of provinces in each country is provided in Appendix 1. Our sample is restricted only to investments in the manufacturing industry. In this paper, we categorize each province into certain groups: coastal provinces[6] in China into "Coastal"; internal provinces in China into "Internal"; Indonesia, Malaysia, the Philippines, and Thailand into "ASEAN4"; Cambodia, Laos, Myanmar, and Vietnam into "CLMV." As mentioned in the introductory section, the Chinese government conducted different policy treatment between coastal and internal provinces. The classification of ASEAN4 and CLMV is because countries in CLMV joined ASEAN in a later period and followed a slower trade liberalization (tariff reduction) process than those in ASEAN4. ASEAN4 and CLMV are often called "forerunners of ASEAN" and "latecomers to ASEAN," respectively. These groups are later used for structuring our nests in the estimation.

The data on Japanese FDI in East Asia, which are necessary for constructing our dependent variable and calculating the "Agglomeration" variable, are basically obtained from *Overseas Japanese Companies Data* (Toyo Keizai Inc.). The data focus on a survey of 6,000 listed and non-listed enterprises, and include their overseas affiliate data on: location, investment year, investment type (new establishment, capital investment, and acquisition), amount of capital, total number of employees, number of employees from Japan, earnings, business content, purpose of investment, and funding relationship. The sample affiliates included in this database are those in which a Japanese firm has invested capital of 10% or more. In addition to *Overseas Japanese Companies Data*, we also use some other data sources as supplements because it is more difficult to obtain comprehensive data in less developed countries. Specifically, the following data are used: *Foreign Direct Investment Companies in Myanmar* (Myanmar Survey Research) for Japanese FDI in Myanmar; data on Japanese FDI in Cambodian and Laos prepared by the Cambodia Investment Board and the Department of Domestic and Foreign Investment, Ministry of Planning and Investment, respectively.

Our data sources for location elements are as follows. Province-level data on population and GRDP per capita are obtained from the *Statistical Yearbook of Myanmar* of the Central Statistical Organization for Myanmar; the National Institute of

[6] The coastal provinces include Fujian, Guandong, Guangxi, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, and Zhejiang.

Statistics (unofficial estimates of GRDP) for Cambodia; the National Statistical Center, Ministry of Planning and Investment for Laos; *Socio-economic Statistical Data of 63 Provinces and Cities* for Vietnam; *Statistical Yearbook of Indonesia* for Indonesia; *Yearbook of Statistics, Malaysia* for Malaysia; *Statistical Yearbook of Indonesia* for Indonesia; *Philippine Statistical Yearbook* for the Philippines; *China Statistical Yearbook* for China. Unfortunately, GDP per capita is only available at the country level in Myanmar. Thus, we use the country-level GDP per capita for each province in Myanmar. While we use data on GRDP per capita as an explanatory variable, population data are used for calculating GRDP in each Myanmar province by multiplying population by GRDP per capita.

The data sources of the other variables are as follows. Information on BIT and WTO membership is obtainable from Investment Instruments Online on the UNCTAD website[7] and the WTO website,[8] respectively. The sectoral tariff rates on products from Japan are drawn from the World Integrated Trade Solution (World Bank).[9] Geographical distance from Japan is calculated using latitudes and longitudes of Tokyo and each East Asian region. Also, the geographical distance among capital cities in our sample provinces is calculated in the same manner. Using the above-calculated GRDP and this distance dataset, we calculate the market potential measure, namely the sum of distance-weighted GRDP. Access by transportation is reflected by the "Port" dummy and "Asian Highway" dummy. Major seaports and international airports are listed in Appendices 2 and 3. Using the information gathered by UNESCAP,[10] we construct "Asian Highway" dummies based on construction year.

Table 1 shows the new entry of Japanese MNEs in each country during 1996-2006. There are three noteworthy points. First, Japanese firms have increased new investments to China drastically since its joining the WTO in 2001. The magnitude relation between FDIs to China and ASEAN was then reversed. China's joining the WTO is an important turning point in Japanese FDI in East Asia. But, as is well known, Japanese FDI in China is concentrated in coastal provinces. Second, Thailand is the country attracting a largest number of Japanese MNEs among ASEAN countries. In most years, Thailand has attracted about half of the Japanese investments in ASEAN. Third, recently there are few differences in the number of Japanese

[7] http://www.unctadxi.org/templates/docsearch____779.aspx
[8] http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm
[9] Our sample includes 18 sectors: Food; Textiles; Wood; Paper; Printing; Chemicals; Petroleum; Rubber; Minerals; Basic Metals; Non-metals; Metals; Machinery; Electronics; Transport; Automobiles; Precision; Others
[10] http://www.unescap.org/ttdw/common/tis/ah/Database.asp

affiliates between ASEAN4 and CLMV because of their remarkable decrease in ASEAN4. In particular, among CLMV countries, Japanese MNEs have invested most in Vietnam. As a result, Vietnam has recently become the second-largest recipient of Japanese FDI even among all ASEAN countries.

=== Table 1 ===

The sub-national-level distribution of Japanese affiliates entering during 1996-2006 is shown in Figure 1. From this figure, we can see that a larger number of new Japanese affiliates are found in capital cities. In addition, coastal provinces in China and Ho Chi Minh in Vietnam attract a large number of Japanese affiliates. However, compared with the magnitude of their numbers in ASEAN countries, that in China is outstandingly large. The top 25 provinces in terms of entry of Japanese affiliates during 1996-2006 are reported in Table 2. Again, three points are noteworthy. First, seven provinces among the top 10 provinces are Chinese provinces. In particular, the top 3 provinces are all Chinese provinces and have an overwhelming number of Japanese firms entering. Second, provinces in some ASEAN countries are nominated among the top 25 provinces. The most highly ranked province in these countries is West Java in Indonesia, Bangkok in Thailand, Region IV-A in the Philippines, Selangor in Malaysia, and Hanoi in Vietnam. Third, as we can see from the second point, there are no provinces in Cambodia, Laos, and Myanmar that are nominated among the top 25 provinces.

=== Table 2 & Figure 1 ===

5. Empirical Results

In this section, we report the estimation results of our nested logit model. We first search for a "good" nesting structure among provinces in East Asian countries. We then incorporate some characteristics of firms into our model. The basic statistics of our model are provided in Table 3.

=== Table 3 ===

Before estimating nested logit models, we estimate the conditional logit model for reference. The results are reported in column (I) in Table 4. The findings are as

follows. As in existing studies, Japanese MNEs invest in provinces with better access to the market, those with a larger number of Japanese firms, and those in WTO member countries or BIT partners. The result of "GDP per Capita" indicates that provinces with lower GDP per capita tend to attract a larger number of MNEs. This implies the dominant effect of wages over that of the socio-economic environment. The coefficient for "Distance from Japan" is estimated to be significantly negative, indicating that MNEs are likely to invest in provinces less distant from the home country because they can save communication costs and transport costs between their plants and headquarters. Among infrastructural variables, a significant result can be found only in "Asian Highway 1-digit." One possible interpretation is that the existence of ports is less important than that of wide roads with access to these ports. Last, the host country's tariff rates on products from Japan have a significantly negative coefficient. As is consistent with our expectation and the prediction of vertical FDI theory, lower tariff rates in host countries matter in the case of vertical FDI.

=== Table 4 ===

Next, we will seek a *good* tree structure for Japanese investors among East Asian developing countries by estimating the nested logit model for our sample. However, we do not try to identify the nesting structure that would be *most* supported by the data because the number of alternatives and thus the number of possible nests in this paper are quite large and make the search for the *best* structure rather cumbersome. Instead, as mentioned in the previous section, based on the stage of economic development or regional differentiation of policies, we first partition a set of our sample provinces into the following four subgroups: CLMV (latecomers to ASEAN), ASEAN4 (forerunners of ASEAN), Coastal China, and Internal China. We then assume several types of upper-level decision by further grouping these four subgroups. The upper-level decision in column (II) is either to locate to [ASEAN4 & CLMV] or to [Coastal China & Internal China]. Similarly, the decision in (III) is either to locate to [ASEAN4], [CLMV], or [Coastal China & Internal China]; the decision in (IV) is either to locate to [ASEAN4], [CLMV], [Coastal China], or [Internal China]; the decision in (V) is either to locate to [CLMV] or [ASEAN4 & Coastal China & Internal China]; the decision in (VI) is either to locate to [CLMV], [ASEAN4 & Coastal China], or [Internal China]; the decision in (VII) is either to locate to [CLMV & Internal China] or [ASEAN4 & Coastal China]. Under these kinds of two-level tree structures, we estimate the two-level nested logit model for our sample.

The results of various types of two-stage nested logit model are reported in columns (II)-(VII). It is well known that "there is no well-defined testing procedure for discriminating among tree structures" (Greene, 2002, p. 727). In this paper, we shed light on the (log) likelihood and IV parameters, which can be used for evaluating the nesting structure to some extent. From the likelihood viewpoint, the tree structure in (V) is the best, though its difference among all patterns may be trivial. On the other hand, as mentioned in Section 2, the IV parameter must lie between 0 and 1 for global consistency with the RUM. The two models, i.e., (III) and (V), have IV parameters in this range. As a result, based on the criteria of both likelihood and IV parameters, we may conclude that the method of grouping in column (V) is the best among our six two-level tree structures. Under this grouping, we can see from the "LR test for IIA," which reports the chi-squared statistics for testing whether or not the IV parameter is different from unity, that the IV parameter is statistically different from unity. Thus, we can say that the use of the conditional logit model is not appropriate.

The results of the tree structure of (V) are as follows. First, among explanatory variables, major differences from the results in (I) are observed in "GRDP per Capita" and "Tariff rates in the Host," for which coefficients are estimated to be significantly positive and insignificant, respectively. The positive result of "GRDP per Capita" indicates the dominant effect of socio-economic environment in contrast to the dominant effect of wages in the result of the conditional logit model. One possible reason for the insignificant result regarding tariffs is that our sample countries often exempt MNEs from paying tariffs on materials or parts imported for assembly and exported as finished products. This is the so-called incentive scheme for foreign investors and aims to attract a larger number of MNEs. As a result, an MNE enjoying this scheme does not need to worry about tariff rates in the host country. Second, this tree structure implies that Japanese MNEs consider CLMV countries to be host countries different from China and the forerunners of ASEAN. In other words, for Japanese investors, ASEAN forerunners are countries replaceable by China.

Next, we estimate the higher-stage nested logit model. Two kinds of three-stage model to be estimated are depicted in Figures 2 and 3. Based on the above results in the two-stage nested logit model, the top-level decision is whether to invest in either [CLMV] or [China or ASEAN4]. The middle-level decision under the top-level decision of [China or ASEAN4] is whether to invest in either [China] or [ASEAN4] in Figure 2 and whether to invest in either [China], [Thailand], [the Philippines], [Malaysia], or [Indonesia] in Figure 3. The results for the first (Figure 2) and second (Figure 3) kinds of three-stage model are reported in columns (I) and (II) in Table 5,

respectively, and are similar to those in column (V) in Table 4. One difference between these two three-stage models lies in "GRDP per Capita"; while the one yields a significantly positive result, the other yields an insignificant result. In addition, both kinds of three-stage model have an RUM consistent IV parameters at all levels of decision. However, our three-stage nested logit models do not improve the fitness for data from the viewpoint of log-likelihood, compared with the two-stage nested logit model of column (V) in Table 4.

=== Table 5 and Figures 2 & 3 ===

Last, we also estimate the four-stage nested logit model. We set the tree structure as described in Figure 4. The first decision is based on the results in Table 4 and is also the same as in the above three-stage nested logit model: [CLMV] or [China or ASEAN4]. The second decision under the choice of [China or ASEAN4] is whether to invest in either [China] or [ASEAN4], which is based on a slightly larger log-likelihood in column (I) than that in column (II). In the third decision, while the choice of [China] has two branches, [Coastal] and [Internal], the choice of [ASEAN4] involves the four branches of [Thailand], [the Philippines], [Malaysia], and [Indonesia]. On the other hand, the second decision under the choice of [CLMV] is where to invest among [Cambodia], [Laos], [Myanmar], and [Vietnam], and the third decision is the same as this, i.e., degenerate branches. The last decision is the choice of provinces. With these nests, we intend to uncover the location of Japanese MNEs in East Asian developing countries in greater detail.

=== Figure 4 ===

The results for our four-stage nested logit model are reported in column (III) in Table 5 and are as follows. First, the results of explanatory variables are similar to those in the conditional-logit model. In particular, both "GRDP per Capita" and "Tariff rates in the Host," which are supposed to be important location elements for vertical FDI, have significantly negative coefficients. One difference from the previous results is the significantly positive coefficient for "Asian Highway 2-digit," albeit at the 10% significance level. Nevertheless, "Seaports/Airports" has an insignificant coefficient, indicating again that not ports *per se* but that road accessibility to ports matters. Second, the IV parameters at all levels are estimated to be between zero and one and are consistent with the RUM. Third, the log-likelihood rises remarkably. In sum, our

four-stage nest structure is better supported by the data than the previous two-/three-stage structures. Also, more importantly, the significance and even sign in some coefficients differ widely according to the tree structures.

6. Concluding Remarks

Unlike most existing studies, this paper examines the location choices of MNEs in developing countries. We specifically explore the location choices among East Asian developing countries of Japanese MNEs using the four-stage nested logit model at the province level. Important results concerning location elements are as follows. In accordance with the mechanics of cheap labor-seeking FDI, Japanese MNEs are more likely to invest in low-income locations with low tariff rates on products from Japan. Moreover, accessibility to other locations and/or ports is important in attracting Japanese MNEs because it is essential when importing materials and exporting their products. Also important are WTO membership and bilateral investment treaties because they contribute to the settlement of trade and investment disputes, which are more likely to occur in developing countries. Last, although the literature on cheap labor-seeking FDI does not elucidate the role of market size, market potential plays a significant role, as in the case of market-seeking FDI.

Due to the large inward FDI in China, policy makers in developing countries, especially ASEAN countries, have worried about the decrease in inward FDI in these countries because it has been replaced with FDI in China. As a result, our analysis in this paper provides the following interpretation on this matter or trend. One of the crucial elements in attracting Japanese FDI is WTO membership. Therefore, after China joined the WTO, Japanese FDI started going intensively to China rather than to the forerunners of ASEAN because China is a substitute in terms of investment destination. The latter argument is based on the result that the forerunners and China share the same upper-level tree in the nested logit model. However, since CLMV countries are taken as different groups of investment destinations from China, these countries, particularly Vietnam, still attract a lot of Japanese FDI even after China joined the WTO.

As a result, we can say that unless ASEAN forerunners keep a better investment climate than China, Japanese MNEs are likely to invest in China instead of these countries. On the other hand, CLMV countries may keep attracting Japanese FDI to some extent. This difference seems to be based on how location advantages differ across countries/provinces. CLMV countries are still immature in terms of economic

development. Thus, the potential production stages that MNEs try to relocate from home to these countries are totally different from the case of China or the forerunners of ASEAN, in terms of technology level, capital-labor ratio, etc. However, since these location advantages are similar between China and the forerunners of ASEAN, they are in the fierce competition in attracting FDI.

References

Arndt, S. and Kierzkowski, H., 2001, *Fragmentation: New Production Patterns in the World Economy*, Oxford University Press.

Baltagi, B.H., Egger, P., and Pfaffermayr, M., 2007, Estimating Models of complex FDI: Are there Third-country Effects?, *Journal of Econometrics*, 140: 260-281.

Basile, R., Castellani, D., and Zanfei, A., 2008, Location Choices of Multinational Firms in Europe: the Role of EU Cohesion Policy, *Journal of International Economics*, 74(2): 328-340.

Basile, R., Castellani, D., and Zanfei, A., 2009, National Boundaries and the Location of Multinational Firms in Europe, *Papers in Regional Science*, 88(4): 733-748.

Belderbos, R. and Carree, M., 2002, The Location of Japanese Investments in China: Agglomeration Effects, Keiretsu, and Firm Heterogeneity, *Journal of the Japanese and International Economies*, 16(2): 194-211.

Blonigen, B., Davies, R., Waddella, G., and Naughtona, H., 2007, FDI in space: Spatial Autoregressive Relationships in Foreign Direct Investment, *European Economic Review*, 51(5): 1303-1325.

Brambilla, I., 2009, Multinationals, Technology, and the Introduction of Varieties of Goods, *Journal of International Economics*, 79(1): 89-101.

Castellani, D. and Zanfei, A., 2004, Choosing International Linkage Strategies in the Electronics Industry: the Role of Multinational Experience, *Journal of Economic Behavior & Organization*, 53(4): 447-475.

Crespo, N. and Fontoura, M. P., 2007, Determinant Factors of FDI Spillovers - What Do We Really Know?, *World Development*, 35(3): 410-425.

Crozet, M., Mayer, T., and Mucchielli, J-L., 2004, How Do Firms Agglomerate? A Study of FDI in France, *Regional Science and Urban Economics*, 34(1): 27-54.

Disdier, A-C. and Mayer, T., 2004, How Different is Eastern Europe? Structure and Determinants of Location Choices by French Firms in Eastern and Western Europe, *Journal of Comparative Economics*, 32(2): 280-296.

Ekholm, K., Forslid, R.,and Markusen, J., 2007, Export-platform Foreign Direct Investment, *Journal of European Economic Association*, 5(4): 776-795.

Feenstra, R. and Hanson, G., 1996, Foreign Investment, Outsourcing and Relative Wages, in Robert C. Feenstra, Gene M. Grossman, and Douglas A. Irwin, eds., *Political Economy of Trade Policy: Essays in Honor of Jagdish Bhagwati*, Cambridge, MA: MIT Press, 1996, pp. 89-127.

Greene, W., 2002, *Econometric Analysis*, Prentice Hall; 5th Edition, International

Edition.

Grossman, G., Helpman, E., and Szeidl, A., 2006, Optimal Integration Strategies for the Multinational Firm, *Journal of International Economics*, 70: 216-238.

Head, K. and Mayer, T., 2004, Market Potential and the Location of Japanese Investment in the European Union, *Review of Economics and Statistics*, 86(4): 959-972.

Head, K., Ries, J., and Swenson, D., 1999, Attracting Foreign Manufacturing: Investment Promotion and Agglomeration, *Regional Science and Urban Economics*, 29(2): 197-218.

Helpman, E., 1984, Simple Theory of International Trade with Multinational Corporations, *Journal of Political Economy*, 92: 197-218.

Helpman, E., Melitz, M., and Yeaple, S., 2004, Export versus FDI with Heterogeneous Firms, *American Economic Review*, 94(1): 300–316.

Mayer, T., Mejean, I., and Nefussi, B., 2010, The Location of Domestic and Foreign Production Affiliates by French Multinational firms, *Journal of Urban Economics*, 68: 115-128.

McFadden, D., 1974, Conditional Logit Analysis of Qualitative Choice Behavior, In P. Zarembka (eds.), Frontiers in Econometrics, New York: Academic Press.

Train, K., 2003, *Discrete Choice Methods with Simulation*, Cambridge University Press.

Yeaple, S., 2003, The Complex Integration Strategies of Multinationals and Cross Country Dependencies in the Structure of Foreign Direct Investment, *Journal of International Economics*, 60(2): 293–314.

Yeaple, S., 2009, Firm Heterogeneity and the Structure of U.S. Multinational Activity, *Journal of International Economics*, 78(2): 206-215.

Appendix 1. List of Locations

Cambodia (24 Provinces)

Banteay Meanchey, Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Kampot, Kandal, Koh Kong, Kratie, Pailin, Sihanoukville, Mondul Kiri, Oddar Meanchey, Phnom Penh, Pursat, Preah Vihear, Prey Veng, Ratanak Kiri, Siemreap, Stung Treng, Svay Rieng, Takeo, Kep

Laos (17 Provinces)

Vientiane Capital, Phongsaly, Loungnamtha, Oudomxay, Bokeo, Louangphabang, Houaphanh, Xaiyabouly, Xiengkhoung, Vientiane, Bolikhamxay, Khammouan, Savannakhet, Salavanh, Xekong, Champasak, Attapeu

Myanmar (14 Provinces)

Ayeyarwady, Bago, Chin, Kachin, Kayah, Kayin, Magway, Mandalay, Mon, Rakhine, Sagaing, Shan, Tanintharyi, Yangon

Vietnam (64 Provinces)

Ha Noi, Ha Giang, Cao Bang, Bac Kan, Tuyen Quang, Lao Cai, Dien Bien, Lai Chau, Son La, Yen Bai, Hoa Binh, Thai Nguyen, Lang Son, Quang Ninh, Bac Giang, Phu Tho, Vinh Phuc, Bac Ninh, Ha Tay, Hai Duong, Hai Phong, Hung Yen, Thai Binh , Ha Nam, Nam Dinh, Ninh Binh, Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thien-Hue, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, Binh Thuan, Kon Tum, Gia Lai, Dak Lak, Dak Nong, Lam Dong, Binh Phuoc, Tay Ninh, Binh Duong, Dong Nai, Ba Ria-Vung Tau, Ho Chi Minh, Long An, Tien Giang, Ben Tre, Tra Vinh, Vinh Long, Dong Thap, An Giang, Kien Giang, Can Tho, Hau Giang, Soc Trang, Bac Lieu, Ca Mau

Thailand (76 Provinces)

Amnat Charoen, Ang Thong, Bangkok, Buri Ram, Chachoengsao, Chai Nat, Chaiyaphum, Chanthaburi, Chiang Mai, Chiang Rai, Chonburi, Chumphon, Kalasin, Kamphaeng Phet, Kanchanaburi, Khon Kaen, Krabi, Lampang, Lamphun, Loei, Lopburi, Mae Hong Son, Maha Sarakham, Mukdahan, Nakhon Nayok, Nakhon Pathom, Nakhon Phanom, Nakhon Ratchasima, Nakhon Sawan, Nakhon Si Thammarat, Nan, Narathiwat, Nong Bua Lamphu, Nong Khai, Nonthaburi, Pathum Thani, Pattani, Phang Nga, Phatthalung, Phayao, Phetchabun, Phetchaburi, Phichit,

Phitsanulok, Phra Nakhon Si Ayutthaya, Phrae, Phuket, Prachinburi, Prachuap Khiri Khan, Ranong, Ratchaburi, Rayong, Roi Et, Sa Kaeo, Sakon Nakhon, Samut Prakan, Samut Sakhon, Samut Songkhram, Saraburi, Satun, Si Sa Ket, Sing Buri, Songkhla, Sukhothai, Suphan Buri, Surat Thani, Surin, Tak, Trang, Trat, Ubon Ratchathani, Udon Thani, Uthai Thani, Uttaradit, Yala, Yasothon

Malaysia (16 Provinces)

Federal Territory of Kuala Lumpur, Federal Territory of Labuan, Federal Territory of Putrajaya, Johor, Kedah, Kelantan, Malacca, Negeri Sembilan, Pahang, Perak, Perlis, Penang, Sabah, Sarawak, Selangor, Terengganu

Indonesia (33 Provinces)

Aceh, Bali, Bangka-Belitung, Banten, Bengkulu, Central Java, Central Kalimantan, Central Sulawesi, East Java, East Kalimantan, East Nusa Tenggara, Gorontalo, Jakarta Special Capital Region, Jambi, Lampung, Maluku (Moluccas), North Maluku (N.Moluccas), North Sulawesi, North Sumatra, Papua, Riau, Riau Islands, South East Sulawesi, South Kalimantan, South Sulawesi, South Sumatra, West Java, West Kalimantan, West Nusa Tenggara, West Papua, West Sulawesi, West Sumatra, Yogyakarta Special Region

Philippines (17 Provinces)

ARMM, CAR, NCR, Region I, Region II, Region III, Region IV-A, Region IV-B, Region IX, Region V, Region VI, Region VII, Region VIII, Region X, Region XI, Region XII, Region XIII

China (30 Provinces)

Beijing, Tienjin, Shanghai, Hebei, Shanxi, Neimenggu, Liaoning, Jilin, Heilongjiang, Jiangsu, Zhejiang, Anhui, Fujian, Jiangxi, Shandong, Henan, Hupei, Hunan, Guangdong, Guangxi, Hainan, Sichuan, Guizhou, Yunnan, Xizeing, Shaanxi, Qansu, Qinghai, Ninghsia, Xinjiang

Appendix 2. List of Major Airports

Wattay International Airport; Phnom Penh International Airport; Yangon International Airport; Noibai International Airport; Tansonnhat International Airport; Suvarnabhumi International Airport; Don Muang Airport; Chiang Mai International Airport; Phuket International Airport; Hat Yai International Airport; Samui Airport; Seltar Airport; Singapore Changi International Airport; Kuala Lumpur International Airport; Sultan Ismail Airport; Langkawi International Airport; Penang International Airport; Kota Kinabalu International Airport; Kuching International Airport; Sultan Abdul Aziz Shah Airport; Bali International Airport; Soekarno Hatta International Airport; Ninoy Aquind International Airport; Diosdado Macapagal International Airport; Mactan Cebu International Airport; Francisco Bangoy International Airport; Beijing Capital International Airport; Shanghai Hongqiao International Airport; Shanghai Pudong International Airport; Shenyang Taoxian International Airport; Wuhan Tianhe International Airport; Guangzhou Baiyun International Airport; Chengdu Shuangliu International Airport; Kunming Wujiaba International Airport; Xian Xianyang International Airport; Urumqi Diwopu International Airport

Appendix 3. List of Major Seaports

Port Klang; Hai Phong Port; Da Nang Port; Saigon Port; Port of Tanjung Pelepas; Bali Port; Tanjung Priok Port; Belawan Port; Makassar Port; Banjarmasin Port; Sorong Port; Port of Manila; Port of Tianjin; Port of Shanghai; Port of Qinhuangdao; Port of Dalian; Port of Yingkou; Port of Suzhou; Port of Ningbo; Port of Xiamen; Port of Qingdao; Port of Yantai; Port of Guangzhou; Port of Shenzhen; Port of Zhuhai

Table 1. Number of Entries of Japanese Affiliates

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
China	219	92	59	48	40	125	309	323	386	241	96
Coast	192	84	46	44	37	117	302	308	356	221	85
Internal	27	8	13	4	3	8	7	15	30	20	11
ASEAN	327	190	77	66	59	90	92	69	64	65	41
ASEAN4	281	162	58	55	51	81	81	52	49	38	21
Indonesia	79	49	15	8	6	16	19	10	4	3	3
Malaysia	43	23	11	10	10	7	5	6	8	4	3
Philippines	46	19	13	11	11	15	10	5	5	4	1
Thailand	113	71	19	26	24	43	47	31	32	27	14
CLMV	46	28	19	11	8	9	11	17	15	27	20
Cambodia	0	0	0	2	1	0	0	0	0	0	2
Laos	1	1	1	0	2	0	2	1	0	2	1
Myanmar	5	3	4	1	1	2	1	0	0	0	0
Vietnam	40	24	14	8	4	7	8	16	15	25	17

Sources: *Overseas Japanese Companies Data* (Toyo Keizai Inc.); *Foreign Direct Investment Companies in Myanmar* (Myanmar Survey Research) for Japanese FDI in Myanmar; data on Japanese FDI in Cambodia and Laos, which were prepared by the Cambodia Investment Board and the Department of Domestic and Foreign Investment, Ministry of Planning and Investment, respectively.

Table 2. Top 25 Provinces in Terms of Entry of Japanese Affiliates during 1996-2006

Rank	Region	Country	Numbers
1	Jiangsu	China	519
2	Guangdong	China	356
3	Shanghai	China	344
4	Zhejiang	China	158
5	West Java	Indonesia	133
6	Liaoning	China	128
7	Shandong	China	123
8	Bangkok	Thailand	117
9	Region IV-A	Philippines	96
10	Tienjin	China	76
11	Rayong	Thailand	66
12	Chonburi	Thailand	61
13	Phra Nakhon Si Ayutthaya	Thailand	59
14	Selangor	Malaysia	54
15	Jakarta Special Capital Region	Indonesia	49
16	Samut Prakan	Thailand	48
17	Ha Noi	Vietnam	46
18	Fujian	China	40
19	Hebei	China	40
20	Ho Chi Minh	Vietnam	37
21	Beijing	China	30
22	Hai Phong	Vietnam	26
23	Pathum Thani	Thailand	26
24	Chachoengsao	Thailand	24
25	Federal Territory of Kuala Lumpur	Malaysia	23

Sources: Overseas Japanese Companies Data (Toyo Keizai Inc.); "Foreign Direct Investment Companies in Myanmar (Myanmar Survey Research)" for Japanese FDI in Myanmar; data of Japanese FDI in Cambodian and Laos which were prepared by the "Cambodia Investment Board" and the "Department of Domestic and Foreign Investment, Ministry of Planning and Investment", respectively.

Table 3. Basic Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Market potential	349,448	21.518	0.439	19.229	22.695
GRDP per capita	349,448	6.938	1.001	4.621	9.909
Agglomeration	349,448	-1.400	8.353	-20.723	6.441
Distance from Japan	349,448	8.267	0.319	7.334	8.824
Seaports/Airports	349,448	0.337	0.473	0	1
Asian Highway 1-digit	349,448	0.407	0.491	0	1
Asian Highway 2-digit	349,448	0.333	0.471	0	1
Tariff rates in Host	349,448	0.150	0.111	0	0.672
WTO membership	349,448	0.647	0.478	0	1
BIT	349,448	0.281	0.449	0	1

Table 4. Exploring the Nesting Structure: Nested Logit Model

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Province-level variables							
Market potential	0.584***	1.708***	0.265***	0.959***	0.267***	0.673***	1.010***
	[0.060]	[0.260]	[0.038]	[0.109]	[0.039]	[0.078]	[0.114]
GRDP per capita	-0.096**	-0.223*	0.053**	-0.313***	0.062**	-0.139***	-0.219***
	[0.043]	[0.122]	[0.024]	[0.073]	[0.024]	[0.051]	[0.066]
Agglomeration	0.627***	1.925***	0.354***	0.783***	0.386***	0.658***	0.793***
	[0.018]	[0.218]	[0.021]	[0.033]	[0.017]	[0.023]	[0.034]
Distance from Japan	-0.548***	-1.215***	-0.367***	-0.603***	-0.391***	-0.556***	-0.617***
	[0.102]	[0.322]	[0.058]	[0.138]	[0.061]	[0.111]	[0.147]
Seaports/Airports	0.065	0.269	-0.028	0.124	-0.032	0.068	-0.026
	[0.058]	[0.181]	[0.032]	[0.080]	[0.034]	[0.063]	[0.086]
Asian Highway 1-digit	0.374***	1.075***	0.168***	0.613***	0.167***	0.430***	0.629***
	[0.046]	[0.174]	[0.027]	[0.077]	[0.028]	[0.057]	[0.079]
Asian Highway 2-digit	-0.014	-0.036	0.007	0.005	0.003	-0.004	0.07
	[0.049]	[0.151]	[0.026]	[0.068]	[0.028]	[0.054]	[0.072]
Country-level variables							
Tariff rates in Host	-1.756***	-0.477	-0.592**	-2.447***	0.091	-2.189***	-3.090***
	[0.320]	[0.458]	[0.268]	[0.358]	[0.202]	[0.399]	[0.517]
WTO membership	0.643***	0.724***	0.996***	0.447***	0.830***	0.577***	0.673***
	[0.084]	[0.122]	[0.064]	[0.097]	[0.049]	[0.096]	[0.120]
BIT	1.110***	1.577***	1.314***	1.154***	0.927***	1.181***	1.779***
	[0.103]	[0.299]	[0.074]	[0.127]	[0.066]	[0.115]	[0.184]
Dissimilarity parameters		3.103	0.534	1.388	0.572	1.086	1.434
		[0.350]	[0.029]	[0.068]	[0.022]	[0.040]	[0.070]
LR test for IIA		85.84***	112.85***	45.32***	205.84***	5.12**	58.73***
Number of observations	349,448	349,448	349,448	349,448	349,448	349,448	349,448
Number of cases		2,888	2,888	2,888	2,888	2,888	2,888
Pseudo R2	0.2684						
Log likelihood	-10133	-10090	-10077	-10110	-10030	-10130	-10104

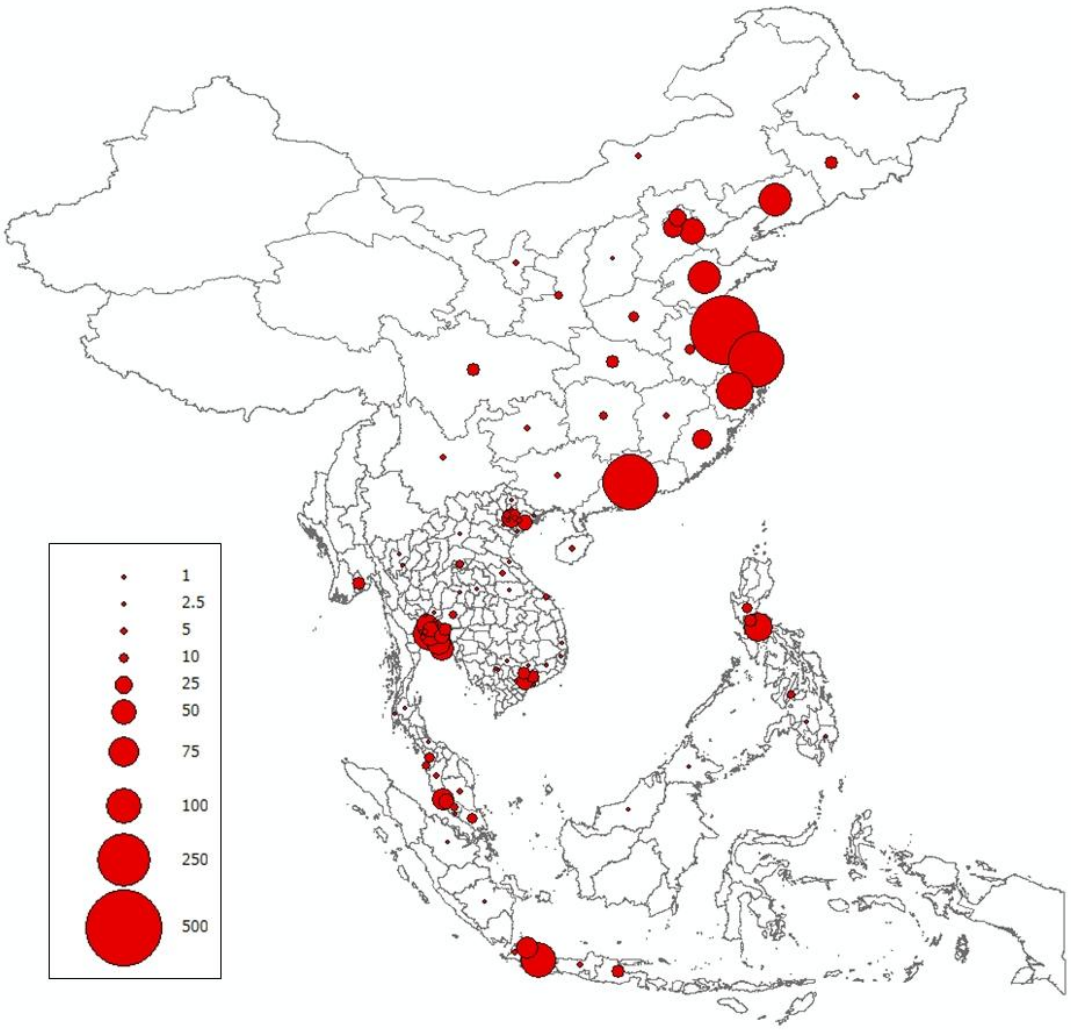
Notes: ***, **, and * indicate, respectively, the 1%, 5%, and 10% levels of statistical significance. Standard errors are in parentheses. "LR test for IIA" indicates the test statistics on the null hypothesis that the dissimilarity parameter is unity. The groups in the upper level are (II): [ASEAN4 & CLMV] vs. [Coastal China & Internal China]; (III): [ASEAN4 vs. CLMV] vs. [Coastal China & Internal China]; (IV): [ASEAN4] vs. [CLMV] vs. [Coastal China] vs. [Internal China]; (V): [CLMV] vs. [ASEAN4 & Coastal China & Internal China]; (VI): [CLMV] vs. [ASEAN4 & Coastal China] vs. [Internal China]; (VII): [CLMV & Internal China] vs. [ASEAN4 & Coastal China].

Table 5. Higher Level of the Nested Logit Model

	(I)	(II)	(III)
Province-level variables			
Market potential	0.276***	0.281***	0.523***
	[0.040]	[0.044]	[0.057]
GRDP per capita	0.055**	0.049	-0.164***
	[0.026]	[0.032]	[0.036]
Agglomeration	0.396***	0.398***	0.486***
	[0.019]	[0.024]	[0.024]
Distance from Japan	-0.402***	-0.399***	-0.393***
	[0.063]	[0.064]	[0.080]
Seaports/Airports	-0.026	-0.027	-0.032
	[0.035]	[0.036]	[0.047]
Asian Highway 1-digit	0.171***	0.171***	0.266***
	[0.029]	[0.029]	[0.039]
Asian Highway 2-digit	-0.001	0.002	0.074*
	[0.029]	[0.029]	[0.038]
Country-level variables			
Tariff rates in Host	0.129	0.077	-0.440*
	[0.197]	[0.202]	[0.231]
WTO membership	0.793***	0.821***	0.953***
	[0.055]	[0.051]	[0.063]
BIT	0.869***	0.871***	0.697***
	[0.079]	[0.106]	[0.094]
Dissimilarity parameters			
1st-level	0.541	0.565	0.656
	[0.031]	[0.024]	[0.039]
2nd-level	0.589	0.589	0.460
	[0.025]	[0.034]	[0.022]
3rd-level			0.816
			[0.043]
LR test for IIA	207.51***	206.29***	368.32***
Number of observations	349,448	349,448	349,448
Number of cases	2,888	2,888	2,888
Log likelihood	-10029	-10030	-9949

Notes: ***, **, and * indicate, respectively, the 1%, 5%, and 10% levels of statistical significance. Standard errors are in parentheses. "LR test for IIA" indicates the test statistics on the null hypothesis that the dissimilarity parameter is unity. The tree structures in (I), (II), and (III) are illustrated in Figures 2, 3, and 4, respectively.

Figure 1. Distribution of New Japanese Affiliates during 1996-2006



Sources: Overseas Japanese Companies Data (Toyo Keizai Inc.); "Foreign Direct Investment Companies in Myanmar (Myanmar Survey Research)" for Japanese FDI in Myanmar; data of Japanese FDI in Cambodian and Laos which were prepared by the "Cambodia Investment Board" and the "Department of Domestic and Foreign Investment, Ministry of Planning and Investment", respectively.

Figure 2. Three-level Nested Tree: China versus ASEAN4

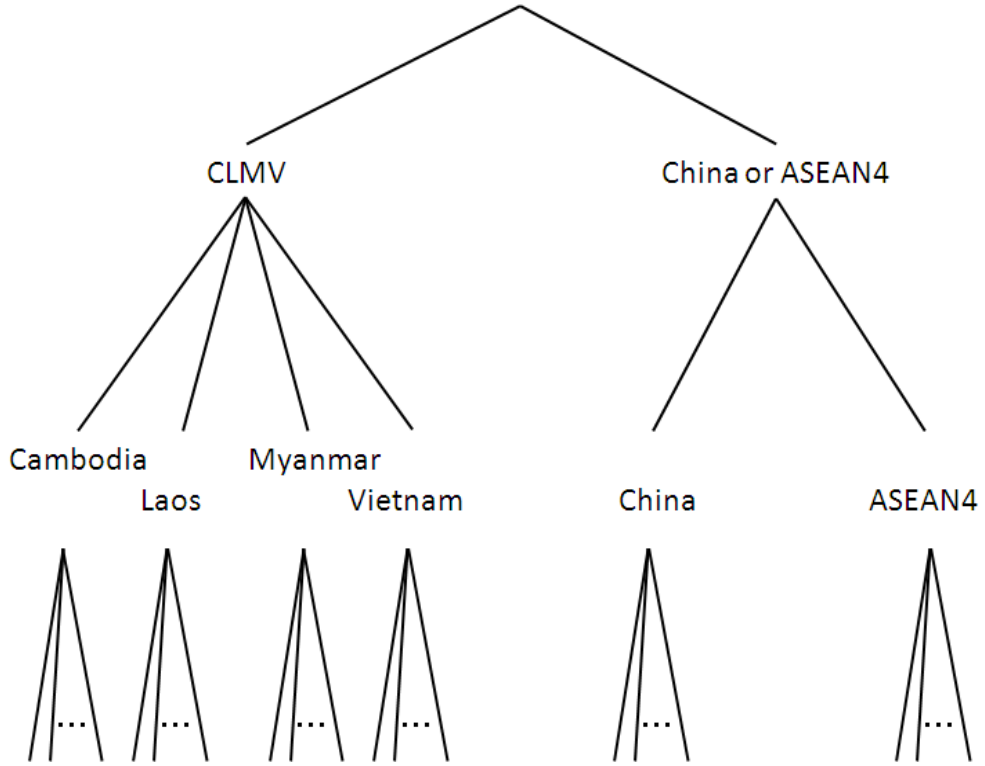


Figure 3. Three-level Nested Tree: Competition among China and ASEAN4 Countries

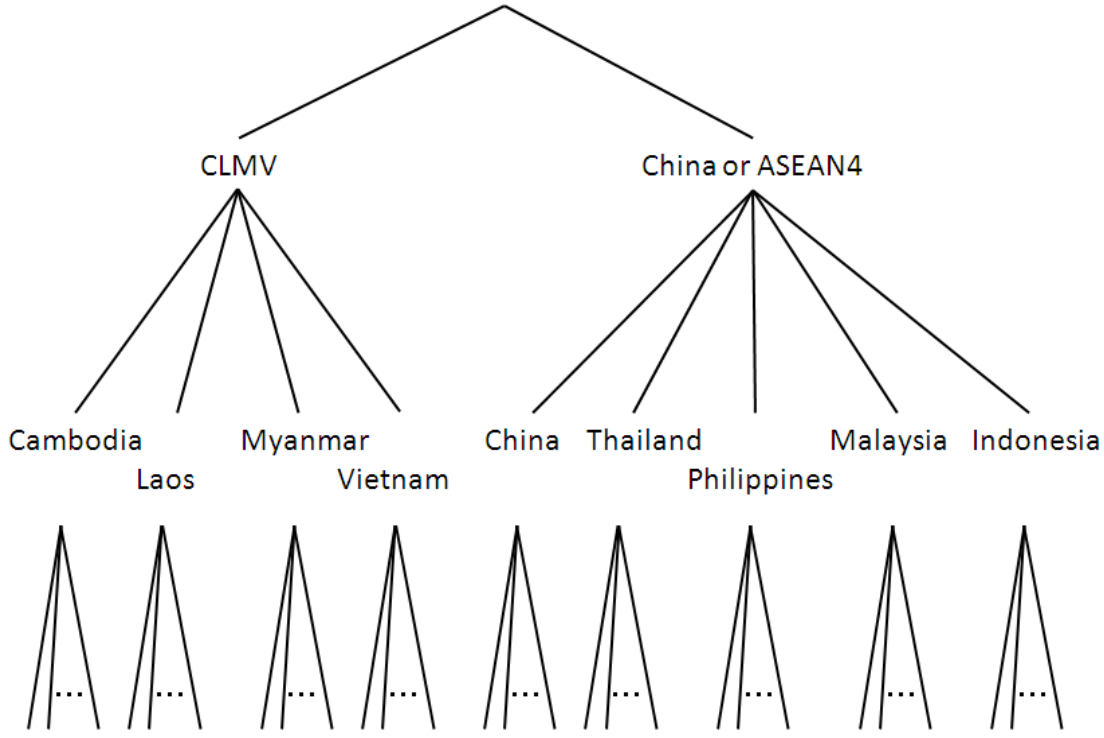


Figure 4. Four-level Nested Tree