

The role of home and host country characteristics in FDI: firm-level evidence from Japan, Korea and Taiwan

著者	Hayakawa Kazunobu, Lee Hyun-Hoon, Park Donghyun
権利	Copyrights 日本貿易振興機構 (ジェトロ) アジア経済研究所 / Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO) http://www.ide.go.jp
journal or publication title	IDE Discussion Paper
volume	267
year	2010-12
URL	http://hdl.handle.net/2344/929

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

IDE DISCUSSION PAPER No. 267

**The Role of Home and Host Country
Characteristics in FDI: Firm-Level
Evidence from Japan, Korea and Taiwan**

Kazunobu HAYAKAWA, Hyun-Hoon LEE
Donghyun PARK

December 2010

Abstract

There is a large and growing empirical literature that investigates the determinants of outward foreign direct investment (FDI). This literature examines primarily the effect of host country characteristics on FDI even though home country characteristics also influence the decision of firms to invest abroad. In this paper, we examine the role of both host and home country characteristics in FDI. To do so, we constructed a firm-level database of outward FDI from Japan, Korea, and Taiwan. Our empirical analysis yields two main findings. First, host countries with better environment for FDI, in terms of larger market size, smaller fixed entry costs, and lower wages, attract more foreign investors. Second, firms from home countries with higher wages are more likely to invest abroad. An interesting and significant policy implication of our empirical evidence is that policymakers seeking to promote FDI inflows should prioritize countries with higher wages.

Keywords: FDI; Multinational firm; Firm heterogeneity; Productivity

JEL classification: F21, F23, D24

* Corresponding author: Hyun-Hoon Lee, Division of Economics and International Trade, Kangwon National University, Chuncheon, 200-701, South Korea. Phone: 82-33-250-6186; Fax: 82-33-256-4088; Email: hhlee@kangwon.ac.kr

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.

The views expressed in this publication are those of the author(s). Publication does not imply endorsement by the Institute of Developing Economies of any of the views expressed within.

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

©2010 by Institute of Developing Economies, JETRO

No part of this publication may be reproduced without the prior permission of the IDE-JETRO.

The Role of Home and Host Country Characteristics in FDI: Firm-Level Evidence from Japan, Korea and Taiwan

Kazunobu HAYAKAWA[#]

Inter-Disciplinary Studies Center, Institute of Developing Economies, Japan

Hyun-Hoon LEE[§]

Department of International Trade and Business, Kangwon National University, Korea

Donghyun PARK

Economics and Research Department, Asian Development Bank, Philippines

Abstract

There is a large and growing empirical literature that investigates the determinants of outward foreign direct investment (FDI). This literature examines primarily the effect of host country characteristics on FDI even though home country characteristics also influence the decision of firms to invest abroad. In this paper, we examine the role of both host and home country characteristics in FDI. To do so, we constructed a firm-level database of outward FDI from Japan, Korea, and Taiwan. Our empirical analysis yields two main findings. First, host countries with better environment for FDI, in terms of larger market size, smaller fixed entry costs, and lower wages, attract more foreign investors. Second, firms from home countries with higher wages are more likely to invest abroad. An interesting and significant policy implication of our empirical evidence is that policymakers seeking to promote FDI inflows should prioritize countries with higher wages.

Keywords

FDI; Multinational firm; Firm heterogeneity; Productivity

JEL Classification

F21, F23, D24

[#] We would like to thank Kuo-I Chang and Kiyoyasu Tanaka for their invaluable comments. The financial support by a JSPS Grant-in-Aid for Young Scientists (B) is also acknowledged.

[§] Corresponding author. Hyun-Hoon Lee, Division of Economics and International Trade, Kangwon National University, Chuncheon, 200-701, South Korea. Phone: 82-33-250-6186; Fax: 82-33-256-4088; Email: hhlee@kangwon.ac.kr

1 Introduction

The most distinctive feature of the current wave of globalization is the prominent role of multinational enterprises (MNEs). For example, a large share of global trade takes place among the different components of an MNE. While the world economy has experienced earlier episodes of globalization, companies which operate in several countries played a much smaller role during those historical episodes. MNEs have expanded their activities into an ever-growing number of countries to the extent that many of them have become truly global organizations with a global presence. In particular, the larger, more well-established MNEs have set up global production and distribution networks which supply the entire world. It has become increasingly meaningless to talk about the nationality of some MNEs. Within this broader trend of the globalization of MNEs, there is considerable heterogeneity in the location of their activities. While virtually all countries now compete vigorously for FDI inflows, the distribution of those inflows is far from uniform. While advanced economies and fast-growing emerging markets such as China pull in enormous amounts of FDI inflows, some regions such as sub-Saharan Africa lag far behind. It is important for FDI-seeking policymakers to have a good grasp of the underlying drivers of the MNEs' location decisions in order to attract inward FDI.

Firm characteristics and host country characteristics shape the systematic pecking order of the MNEs' investment decision-making process. According to Helpman, Melitz and Yeaple (2004), a firm's relative productivity plays a major role in this process because only more productive firms can earn enough operating profits to recoup the high sunk costs of investing in a foreign country. Such sunk costs include the cost of acquiring information so

as to overcome the lack of knowledge and familiarity with the country. Yeaple (2009) further extends this insight to propose two types of pecking order in investment decision-making. First, more productive MNEs can invest in a larger number of countries because those firms can cover the higher total sunk costs associated with investing in a larger number of separate foreign markets. Second, countries with a more favorable investment environment attract a larger number of MNEs since it is easier to earn profits in such countries. The combined pecking order predicts that only the most productive MNE would invest in the least attractive host countries, and progressively less productive firms invest in progressively more attractive countries. Using cross-sectional data on outward FDI from the US, Yeaple (2009) empirically examines the two theoretical pecking orders. His evidence confirms that countries with better investment environments attract more US MNEs and more productive US MNEs invest in more foreign countries.

In addition to firm characteristics and host country characteristics, Yeaple (2009) sets forth a theoretical model which incorporates home country characteristics, in particular wages, into the investment decision-making process. The two main alternatives for a firm to enter a foreign market are (1) to either invest and produce in that market or (2) to produce in the home country and export to that market. Firms will decide to invest if and only if profits from investing are non-negative and exceed those from exporting. Higher wages at home will raise domestic production costs and adversely affect the profitability of exporting vis-à-vis investing. Therefore, firms from high-wage countries are more likely to invest abroad than firms from low-wage countries. More generally, the pecking order of investment decision-making depends not only on firm characteristics and host country

characteristics, but also on home country characteristics. However, Yeaple (2009) does not empirically examine how different wage levels in different countries influence the pecking order since he only considers a single home country – the US.

The central objective of this paper is to empirically examine the role of home country characteristics in the pecking order of MNEs' investment decision-making. Such an empirical examination is largely absent from the large empirical literature on the determinants of FDI and hence our primary contribution to that literature. Policy implications pertaining to host country characteristics are fundamentally different from those pertaining to home country characteristics.¹ The former provides guidance on how host countries can reform their policies in order to attract more foreign investment. For example, greater legal and regulatory certainty makes a country more attractive to foreign investors. On the other hand, the latter informs policy makers about which countries they should prioritize in their efforts to promote inward FDI. Since policy resources for promoting inward FDI are usually limited, especially for developing countries, it is important to allocate such resources to their most productive uses. For example, if firms from higher wage countries are more likely to invest abroad, it would be more efficient for the host country to concentrate its promotional efforts on those countries. An empirical analysis of the effect of home country characteristics on outward FDI pecking order would be valuable for deriving this type of policy implications.

In order to perform our empirical analysis, we constructed an original firm-level

¹ One example of studies using the firm-level FDI data in a multiple country setting is Navaretti, Castellani, and Disdier (2010), which show how outward investments in cheap labor countries affect the home activities of French and Italian firms that turn multinational.

database of outward FDI from Japan, Korea and Taiwan. Besides data availability, the choice of the three countries was motivated by the following three reasons. First, there are sizable differences among the three countries' wage levels. As noted earlier, we can expect the home-country wage level to have a major influence on the decision of firms to invest abroad. In 2005, the manufacturing wages of Japan, Korea and Taiwan were US\$30,000, US\$25,000 and US\$16,000, respectively. Such wage differences are likely to generate different patterns of MNE activity among the three countries. Second, the three countries are major sources of outward FDI with investments all over the world. Many MNEs from the three countries have operations in many different regions. Third, since the three countries share a similar geographical location, we can expect trade costs with host countries in the rest of the world to be similar. This enables us to concentrate on the effect of wage differences among the three countries.

The rest of this paper is organized as follows. Section 2 outlines the theoretical framework of Yeaple (2009) and derives two testable hypotheses from that framework. One of the two hypotheses was not explicitly spelled out in Yeaple (2009). Section 3 describes the data and methodology used in our empirical analysis. Section 4 reports and discusses the main findings that emerge from our empirical analysis, and Section 5 concludes the paper.

2 Theoretical Framework

In this section, we describe the theoretical model which underpins and motivates our empirical analysis. The model is identical to that of Yeaple (2009). Nevertheless, we

present the model here since Yeaple (2009) does not explicitly highlight the role of home country characteristics in the outward FDI pecking order. His model is based on Helpman, Melitz and Yeaple (2004) and based on standard assumptions widely used in the recent literature on firm heterogeneity. More specifically, consumers have CES utility function defined over differentiated products produced by various firms. The market structure for the differentiated products is Dixit-Stiglitz monopolistic competition, and there are ice berg trade costs for shipping them between countries.² The empirical distribution of productivity φ is assumed to be Pareto: $G(\varphi) = 1 - \varphi^{-k}$.

Under those assumptions, the productivity cutoff for home country j firms investing in host country h can be derived as below. Productivity cutoff refers to the productivity level above which firms invest and below which firms do not.

$$(\widehat{\varphi}_{hj})^{\sigma-1} = \sigma \left(\frac{1}{A_j(w_j)^{1-\sigma}} \right) \left(\frac{F_j}{1-(w_h\tau_{hj}/w_j)^{1-\sigma}} \right) \quad (1)$$

where σ , A_j , F_j , and τ_{hj} are the elasticity of substitution, host country j 's market size, fixed entry costs in host country j , and trade cost between countries h and j , respectively. w_j and w_h represent wages in host country j and home country h , respectively. Furthermore, Yeaple (2009) derives the relationship between the number of country h firms that invest in country j and the productivity cutoff as follows:

$$N_{hj} = N_h(\widehat{\varphi}_{hj})^{-k} \quad (2)$$

Substituting equation (2) into equation (1), we obtain:

² As in Yeaple (2009), we do not take into consideration any type of interaction among overseas plants. Such interaction has been closely examined in some studies, including Yeaple (2003), Grossman, Helpman, and Szeidl (2006), Baltagi, Egger, and Pfaffermayr (2007), and Ekholm, Forslid, and Markusen (2007).

$$\begin{aligned}
N_{hj} &= N_h \left(\sigma \left(\frac{1}{A_j (w_j)^{1-\sigma}} \right) \left(\frac{F_j}{1 - (w_h \tau_{hj}/w_j)^{1-\sigma}} \right) \right)^{\frac{-k}{\sigma-1}} \\
&= N_h \sigma^{\frac{-k}{\sigma-1}} \left(\frac{A_j}{F_j} \right)^{\frac{k}{\sigma-1}} \left((w_j)^{1-\sigma} - (w_h \tau_{hj})^{1-\sigma} \right)^{\frac{k}{\sigma-1}} \quad (3)
\end{aligned}$$

where N_h indicates the number of firms in country h . We can observe the following from (3). First, the host economy's market size A_j is positively associated with the number of country h firms that invest in country j , N_{hj} . Second, an increase in the host economy's wages w_j lowers N_{hj} . Third, fixed entry cost F_j is negatively associated with N_{hj} . Fourth, trade cost between countries h and j τ_{hj} is positively associated with N_{hj} . Fifth, and this observation is especially important for our paper, home country's wages w_h are positively associated with N_{hj} .

On the basis of (3), we can derive the role of host country characteristics in the outward FDI pecking order – i.e. the relationship between N_{hj} and country j 's characteristics. Suppose that there are some country h firms whose productivity exceeds the cutoff for investing in country j . Those firms also invest in countries which have a more favorable environment than country j because the productivity cutoff for investing in those countries is lower than the cutoff for investing in country j . In other words, the more favorable the investment environment of a country, the more firms the country attracts. Specifically, let Λ_{hj} be the set of country h firms which invests in country j . Suppose that the number of such firms is increasing in j so that country J is the most attractive. Then, it must be the case that:

$$\Lambda_{h1} \subset \Lambda_{h2} \subset \Lambda_{h3} \subset \dots \subset \Lambda_{hJ} \quad (4)$$

This is a pecking order determined by the host country's relative attractiveness, and can be summarized as follows.

Proposition 1: *Countries with a more favorable environment for inward FDI - in terms of larger market size, larger trade costs, smaller fixed entry costs, and lower wages - attract a larger number of firms from abroad.*

We can derive another proposition, which is not explicitly derived in Yeaple (2009). As shown above, the productivity cutoff for investing in any country falls as the home country's wage rises. Therefore, if all home countries have identical distribution of productivity, identical number of firms, and identical trade costs with host countries, the number of firms from countries with higher wages is larger in any host country. This is because such firms face lower productivity cutoff for investing in any country than firms from countries with lower wages. Specifically, we obtain the following:

$$N_{hj} < N_{gj} \text{ for } \forall j \text{ if } w_g > w_h \quad (5)$$

This result can be summarized as follows:

Proposition 2: *A larger number of firms invest abroad from countries with higher wages than from countries with lower wages.*

These two propositions can be empirically tested, as explained in the next section.

3 Data and Empirical Framework

In this section, we describe the data and empirical framework we use for our testing of the two propositions derived in the previous section. Extending Yeaple (2009)³, we regress the following equation in order to examine the validity of Proposition 1.

$$\ln N_{ijt} = \beta_1 \ln \text{GDP}_{jt} + \beta_2 \ln \text{Tax}_{jt} + \beta_3 \ln \text{Tariff}_{jt} + \beta_4 \ln \text{Distance}_{ij} + \beta_5 \text{WTO}_{ijt} + \beta_6 \ln \text{Wages}_{jt} + u_t + \varepsilon_{ijt}. \quad (6)$$

where N_{ijt} is the number of country i firms investing in country j at time t , GDP_{jt} is country j 's GDP at time t , Distance_{ij} is geographical distance between countries i and j , and Wages_{jt} is wages in country j at time t . WTO_{ijt} takes a value of one if both countries are WTO members and zero otherwise. Following Yeaple (2009), we do not attempt to strictly define proxies for every variable in the theoretical model. However, we expect GDP, tax, and wages to be related to market size A , fixed costs F , and wages w in the model, respectively. Also, distance and tariff are related to trade costs τ . We also introduce a year dummy.

We extend equation (6) so as to enable us to examine home country characteristics as follows. As explained in Section 2, the validity of Proposition 2 requires certain assumptions. In particular, our three home countries need to have identical productivity distribution, number of firms, and trade costs with all host countries. We expect the home country dummy to address the first two conditions. Furthermore, the geographical proximity of the three countries to each other lends some support to the third assumption. To further address the third assumption, we include home country-host country pair dummy variables. In this case, we have to drop the country dummies due to perfect

³ More precisely, Yeaple (2009) introduces the host country's GDP and GDP per capita, geographical distance between countries, and English-speaking dummy variable.

multi-collinearity. We experiment with two alternative ways to incorporate home and host wages into the empirical model as follows.

$$\ln N_{ijt} = \beta_1 \ln \text{GDP}_{jt} + \beta_2 \ln \text{Tax}_{jt} + \beta_3 \ln \text{Tariff}_{jt} + \beta_4 \ln \text{Distance}_{ij} + \beta_5 \text{WTO}_{ijt} + \beta_6 \ln \text{Wages}_{jt} + \beta_7 \ln \text{Wages}_{it} + u_{ij} + u_t + \varepsilon_{ijt}. \quad (7)$$

$$\ln N_{ijt} = \beta_1 \ln \text{GDP}_{jt} + \beta_2 \ln \text{Tax}_{jt} + \beta_3 \ln \text{Tariff}_{jt} + \beta_4 \ln \text{Distance}_{ij} + \beta_5 \text{WTO}_{ijt} + \beta_8 \ln (\text{Wages}_{jt}/\text{Wages}_{it}) + u_{ij} + u_t + \varepsilon_{ijt}. \quad (8)$$

The inclusion of the wage ratio in (8) imposes restrictive assumptions about the coefficients for home and host wages, but mitigates multi-collinearity.

In our analysis, we focus on the number of *firms* from a given home country investing in a given host country. Our three home countries are Japan, Korea, and Taiwan.⁴ Our sample period is 1997-2005. Parent firms and their overseas affiliates are restricted to those in the manufacturing industry. We use three firm-level databases for our dependent variable, firm's overseas affiliates – (1) Overseas Japanese Companies Data (Toyo Keizai Inc.) in the case of Japan⁵, (2) Korean Business Directory 2007/2008 (KOTRA) in the case of Korea⁶, and (3) Taiwan Stock Exchange-Market Observation Post System (Taiwan Stock Exchange Corp.)⁷ in the case of Taiwan.

The Overseas Japanese Companies Data is the database of foreign affiliates of Japanese firms. It includes around 20,000 overseas affiliates of Japanese firms in 130 countries as of

⁴ The 58 host countries are Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Brazil, Canada, Chile, China, Costa Rica, Czech Republic, Denmark, Dominican Republic, El Salvador, France, Guatemala, Guyana, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jordan, Lao PDR, Luxembourg, Malaysia, Mauritius, Mexico, Mongolia, Netherlands, New Zealand, Nicaragua, Norway, Pakistan, Panama, Papua New Guinea, Philippines, Poland, Romania, Russian Federation, Saudi Arabia, Singapore, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States, Vietnam.

⁵ See the website

http://www.toyokeizai.net/shop/cdrom/kaigai_cd/detail/BI/0660130b1de80bc637ac64cba63ca12a/

⁶ See the website http://www.gpcbooks.co.kr/newmall/shop/item.php?it_id=908140001.

⁷ See the website <http://newmops.twse.com.tw>.

2006. The database includes information about the name of foreign affiliates and their parent firms, their location, and key indicators such as capital, sales, and the number of employees. The Korean Business Directory 2007/2008 conducted a survey in October to collect information on the activities of Korean multinational firms. The survey found that there were around 9,000 overseas affiliates of Korean firms in 73 countries. The survey provides information on variables such as the name, address, telephone number, and fax number of parent firms, number of affiliate employees, and entry mode. The Japanese and Korean databases include both listed and non listed companies in the stock market of the respective country. On the other hand, Taiwanese data from the Taiwan Stock Exchange-Market Observation Post System are limited to listed companies in the Taiwanese stock market. This database includes around 5,500 overseas affiliates of Taiwanese firms in 89 countries as of 2006. The data include basic information such as affiliates' name, address, and telephone number and the amount of investment. For the sake of consistency, we restrict our sample companies to listed companies in all three countries.

The data sources for the explanatory variables are as follows. The data for GDP and geographical distance between countries are from the World Development Indicator and the CEPII website, respectively. MFN tariff rates - weighted-average - and corporate tax rates are from the UNCTAD Handbook of Statistics online and KPMG's Corporate and Indirect Tax Rate Survey - various years - respectively. The WTO dummy is based on information from the WTO website. The data for wages, which are the average annual payment for manufacturing workers, are obtained from the Industrial Statistics Database of the United

Nations Industrial Development Organization.⁸ The wages for Taiwan and China are from the PC-AXIS database -National Statistics - and China Labour Statistical Yearbook, respectively. GDP and wages are deflated by the US GDP deflator.

Table 1 provides an overview of the destination of outward FDI from the MNEs of the three countries in 1997 and 2005. Other East Asian countries include ASEAN, Mongolia, Korea, Japan, and Taiwan. There are three interesting points about the table. First, Asia is the main destination for the outward FDI of all three countries. In 2005, Asia accounted for 66%, 77%, and 62% of Japanese, Korean and Taiwanese outward FDI, respectively. Second, whereas most Korean and Taiwanese MNEs invest in China or Hong Kong, Japanese MNEs tend to invest in the other East Asian countries. The Japanese tendency is consistent with a well-known stylized fact. Since the Plaza Accord of 1985, Japanese firms have invested heavily in ASEAN countries, and developed intra-East Asian production and distribution networks. Third, between 1997 and 2005, China's share of outward FDI rose substantially for Japan and Korea but not for Taiwan. In line with the stylized facts outlined by Aw and Lee (2008), the top two overseas investment destinations for Taiwanese manufacturing firms are China and the US.

[Table 1]

4 Empirical Results

In this section, we report and discuss the main findings which emerge from our empirical analysis described in the preceding section. Table 2 shows the basic descriptive

⁸ Yeaple (2009) introduces GDP per capita instead of wages.

statistics of our sample. We first try the estimation of the equation including only year dummy variables. Column (I) in Table 3 reports the OLS result of equation (7). There are five points to be noted about the results in Table 3. First, the estimated coefficient for the host country's GDP is positive and significant. A 10% increase in the host country's GDP is associated with a 6% increase in the number of firms investing in that country. Second, the estimated coefficient for the host country's tax rate is negative and significant. This indicates that lower corporate taxes in the host country attract a larger number of foreign MNEs. Third, while the host country's tariff rate is insignificant, distance is negative and significant. Shorter distance between the home and host country lowers the productivity cutoff for entry. According to Chen and Moore (2010) and Kleinert and Toubal (2010), one possible explanation is that distance is positively related to fixed entry costs. Another possible explanation is that the trade cost associated with importing intermediate goods from the home country is positively associated with distance. Fourth, the estimated coefficient for the WTO dummy is unexpectedly negative and significant. WTO membership is expected to boost FDI inflows since it opens the door to global markets and more generally, improves the host country's economic prospects.

[Table 2]

[Table 3]

Fifth, and most significantly for our paper, there is a clear contrast between the estimated coefficients for the host country's wages and home country's wages. On one hand, the estimated coefficient for host wages is negative and significant, indicating that the lower wages in host economies decrease the productivity cutoff for investing in those

countries. Specifically, a 10% decline in the host country's wages leads to a 1.5% increase in the number of firms investing in that host country. On the other hand, home wages are positive and significant. A 10% rise in the home country's wages leads to a 25% increase in the number of firms investing abroad. In short, home and host wages have opposing effects on FDI. Interestingly and significantly, the impact of home wages is much bigger than the impact of host wages. Therefore, while there has been relatively little empirical analysis on the role of home wages in FDI, our evidence suggests that home wages play a substantial role. Overall, our results indicate that host country wages have a negative effect on FDI whereas home country wages have a positive effect.

Column (III) reports the results of equation (8), which incorporates the ratio of host wages to home wages. The WTO dummy is now positive and significant, and thus consistent with our expectations. While host tariff is now negative and significant, host tax becomes insignificant. The somewhat paradoxical result for the host tariff may be due to the fact that while a lower tariff lowers the costs of exporting, it may also lower the cost of importing intermediate goods, which are assembled in the host country for export to third-country markets. The variable of greatest interest to us is the wage ratio. In line with our expectations, the estimated coefficient of the wage ratio is negative and significant. Lower host wages or higher home wages or both increase FDI between the two countries. More precisely, our results imply that a 10% increase in the ratio of host wages to home wages leads to a 5% decrease in the number of home country firms investing in the host country.

Columns (II) and (IV) report the results of regressions which include country-pair

dummy variables. These estimations address the three assumptions underlying Proposition 2: the three home countries have identical productivity distributions, total number of firms, and trade costs with all host countries. Compared with (I), (II) shows a smaller estimated coefficient for the home wage, although it is still larger than the estimated coefficient for the host wage. Host wage is negative but insignificant. Significantly for our purposes, (IV) shows that the ratio of host wages to home wages still has a significant negative effect. However, the magnitude of the effect declines relative to (III). A 10% increase in the wage ratio leads to a 1% fall in the number of investors.

We perform two types of robustness checks. First, we exclude China and Hong Kong from our sample. They are very important host countries for our three home countries and are obviously outliers. Second, we use the number of *overseas affiliates* from each home country as the dependent variable rather than the number of *firms* from each home country. These two numbers become identical if and only if all firms have at most one affiliate in each country. In reality, a large number of firms have multiple affiliates in a given foreign country. Table 4 reports the results of these robustness checks. The results in Table 4 are almost identical to those in Table 3. This indicates that lower host wages or higher home wages or both would increase FDI inflows.

[Table 4]

Finally, we take a look at how outward FDI to low income countries might differ from outward FDI to high income countries. To do that, we first divide host countries into high and low income countries based on the World Bank classification. We then run the above regressions for those two groups of host countries separately. The results are reported in

Table 5. In the high income sample, the estimated coefficient for host GDP has the wrong sign. However, host tax, host tariff and WTO dummy all have expected signs for both high income and low income samples, and many of them are significant. For example, the WTO dummy is positive and significant for both samples. The larger size of its coefficient in the low country sample suggests that WTO membership is a more influential determinant of inward FDI for low income countries than for high income countries. For example, FDI inflows into Vietnam rose sharply after it joined the WTO since Vietnam's WTO membership expanded opportunities for MNEs to export products they produced in Vietnam. The corporate tax rate is significant only in the low income sample.

[Table 5]

We now discuss the results for the wage-related variables. In the high income sample, the results generally do not support our theoretical predictions. The estimated coefficient for home wage is positive but insignificant. Host wage is positive and significant, which is inconsistent with our expectations. One possible explanation is that high wages may indicate the high skill level of the labor force. The positive relationship may simply reflect the stylized fact that MNEs often allocate technology- and skill-intensive activities such as R&D to their affiliates in high income countries. MNEs are attracted not so much by the high wages but the large pool of highly skilled workers in those countries. The ratio of host wages to home wages is positive but insignificant. In contrast to the high income countries, the results for low income countries are broadly similar to the results for the entire sample. Host wages are negative and significant, and home wages are positive but insignificant. Finally, the ratio of host wages to home wages is negative and significant.

5 Concluding Observations

The central objective of our paper, and its primary contribution to the existing empirical literature on the determinants of FDI, is to examine the role of home country characteristics in the pecking order of MNEs' investment decision-making. We use firm-level data from Japan, Korea and Taiwan, three East Asian economies which are globally significant sources of outward FDI, for our empirical analysis. According to the theoretical pecking order set forth and empirically tested by Yeaple (2009), only the most productive firms invest in the least attractive countries, and progressively less productive firms invest in progressively more attractive countries. This type of pecking order assumes that MNEs' investment location decisions are shaped by a combination of the firm's own characteristics and host country characteristics. However, home country characteristics are also likely to exert a significant influence on a firm's decision to invest abroad. In the case of our three countries, high and rising wages at home pushed many manufacturing firms to shift their productive activities abroad. Yeaple (2009) proposes a model which incorporates home country characteristics, in particular wages, into MNEs' investment decision-making but does not empirically test for their effect on outward FDI. Our paper seeks to contribute to the literature by empirically investigating the role of home country wages on the pecking order of MNEs' investment decision-making.

Our empirical analysis yields a number of interesting findings but for our purposes the most relevant ones are those which pertain to the effect of home wages on our dependent variable – i.e. the number of home country firms investing in a host country. Our empirical

evidence indicates that home country wages have a positive and significant effect on the number of investors, in line with our theoretical prediction. More precisely, we find that a 10% increase in home country wages leads to a 25% increase in the number of home country firms investing abroad. Our evidence suggests that host country wages have a negative and significant effect on the number of investors. This result is also consistent with economic intuition. More precisely, we find that a 10% increase in host country wages leads to a 1.5% decline in the number of foreign investors. An alternative specification of the estimating equation involves replacing home and host country wage with the ratio of host country wage to home country wage. In line with our expectations, we find that the wage ratio has a negative and significant effect on the number of investors. All in all, our evidence indicates that host country wages have a negative impact on FDI whereas home country wages have a positive impact. Most significantly, our evidence provides some support to the notion that the pecking order of MNEs' investment decision-making is influenced by both home and host country characteristics.

The most salient policy implication which emerges from our empirical findings is that it may be more efficient for host country policymakers to concentrate their limited policy resources on countries with higher wages. Since our analysis indicates that firms from countries with higher wages are more likely to invest abroad than those from countries with lower wages, it will be more productive for investment promotion authorities to target the former. Furthermore, our results imply that policies specifically targeting high wage countries may be more effective than general tax concessions or the establishment of special economic zones that are open to all investor countries. At a broader level, since we

find that home country characteristics influence the outward FDI of home country firms, host country policymakers should take them into account when allocating their policy resource for attracting FDI. In this connection, Cole, Elliott and Virakul (2010) find that among MNEs investing in Thailand, those from certain countries or regions are more likely to export. To the extent that exporting is a major policy objective, this has significant policy implications. Our paper is far from definitive and marks at best an important first step toward exploring the role of home country characteristics in the pecking order of MNEs' investment decision-making. Promising areas for research include looking at other home countries and other home country characteristics.

References

- Aw, B-Y. and Lee, Y., 2008, Firm Heterogeneity and Location Choice of Taiwanese Multinationals, *Journal of International Economics*, 75: 167-179.
- Baltagi, B.H., Egger, P., Pfaffermayr, M., 2007, Estimating Models of Complex FDI: are There Third-country Effects?, *Journal of Econometrics*, 140: 260-281.
- Chen, M. and Moore, M., 2010, Location Decision of Heterogeneous Multinational Firms, *Journal of International Economics*, 80(2): 188-199.
- Cole, M., Elliott, R. and Virakul, S. (2010), "Firm Heterogeneity, Origin of Ownership and Export Participation," *World Economy* 33(2): 264-291.
- Ekholm, K., Forslid, R., and Markusen, J., 2007, Export-platform Foreign Direct Investment, *Journal of European Economic Association*, 5(4): 776-795.
- Grossman, G., Helpman, E., and Szeidl, A., 2006, Optimal Integration Strategies for the Multinational Firm, *Journal of International Economics*, 70: 216-238.
- Helpman, E., Melitz, M., and Yeaple, S., 2004, Export versus FDI with Heterogeneous Firms, *American Economic Review*, 94(1): 300-316.
- Kleinert, J. and Toubal, F., 2010, Gravity for FDI, *Review of International Economics*, 18(1): 1-13.
- Navaretti, B., Castellani, D., and Disdier, A-C., 2010, How Does Investing in Cheap Labour Countries Affect Performance at Home? Firm-level Evidence from France and Italy, *Oxford Economic Papers*, 62(2): 234-260.
- 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.

Table 1: Distribution of Firms Investing in each Region, by Home Country (%)

	Japan		Korea		Taiwan	
	1997	2005	1997	2005	1997	2005
Africa	1	0.4	1	1	0.5	4
America	21	18	16	13	23	25
USA	14	12	7	7	15	14
Other America	7	6	8	6	8	11
Asia	61	66	77	77	64	62
China & Hong Kong	16	22	42	50	43	43
Other East Asia	43	41	24	19	21	18
Other Asia	3	3	11	9	0.5	1
Europe	15	14	5	8	11	8
Pacific	2	2	1	1	1	1
World	100	100	100	100	100	100

Note: Other East Asian countries include ASEAN countries, Mongolia, Korea, Japan, and Taiwan.

Sources: Overseas Japanese Companies Data (Toyo Keizai Inc.), Korean Business Directory 2007/2008 (KOTRA); Taiwan Stock Exchange-Market Observation Post System (Taiwan Stock Exchange Corp.)

Table 2. Basic Descriptive Statistics

	Obs.	Mean	Std. Dev.	Min	Max
Number of Investing Firms	941	2.19	1.79	0	6.71
Host GDP	941	25.99	1.66	20.39	30.03
Host Tax	941	0.28	0.05	0.12	0.45
Host Tariff	941	0.06	0.06	0	0.38
Distance	941	8.92	0.66	7	9.84
WTO	941	0.82	0.39	0	1
Host Wage	941	8.99	1.25	6.18	10.79
Home Wage	941	9.90	0.33	9.34	10.34
Wage Ratio	941	-0.91	1.31	-4.03	1.22

Notes: All variables except for WTO dummy are taken logs. “Number of Investing Firms” is the number of firms investing from home country i in host country j at time t . The wage ratio is defined as the ratio of country j wages to country i wages at time t .

Table 3. Baseline Results

	(I)	(II)	(III)	(IV)
Host GDP	0.581*** [0.044]	0.150 [0.118]	0.649*** [0.044]	0.199* [0.107]
Host Tax	-1.268* [0.766]	-1.095*** [0.419]	-1.352 [0.951]	-1.084*** [0.419]
Host Tariff	-1.1 [1.001]	-1.098** [0.480]	-5.522*** [1.113]	-1.106** [0.480]
Distance	-1.071*** [0.067]		-0.795*** [0.069]	
WTO	-0.231* [0.130]	0.503*** [0.043]	0.459*** [0.132]	0.496*** [0.042]
Host Wage	-0.150** [0.059]	-0.070 [0.081]		
Home Wage	2.513*** [0.149]	0.209* [0.116]		
Wage Ratio			-0.532*** [0.060]	-0.115* [0.068]
Year	YES	YES	YES	YES
Pair	NO	YES	NO	YES
Observations	941	941	941	941
R-squared	0.5073	0.507	0.3855	0.3855

Notes: The dependent variable is the number of firms investing from country i in country j at time t . The wage ratio is defined as the ratio of host country j wages to home country i wages at time t . Heteroskedasticity-consistent standard errors (White) are in parentheses. ***, **, and * show 1%, 5%, and 10% significance, respectively.

Table 4. Robustness Checks

	Excluding CHN & HKG		Number of Affiliates	
	(II)	(IV)	(II)	(IV)
Host GDP	0.165 [0.119]	0.217** [0.110]	0.154 [0.124]	0.228** [0.113]
Host Tax	-1.122*** [0.423]	-1.118*** [0.424]	-1.039** [0.443]	-1.023** [0.443]
Host Tariff	-1.096** [0.496]	-1.087** [0.496]	-1.241** [0.507]	-1.254** [0.507]
WTO	0.520*** [0.046]	0.508*** [0.045]	0.553*** [0.046]	0.541*** [0.045]
Host Wage	-0.086 [0.083]		-0.057 [0.086]	
Home Wage	0.242** [0.119]		0.267** [0.122]	
Wage Ratio		-0.136* [0.069]		-0.125* [0.072]
Year	YES	YES	YES	YES
Pair	YES	YES	YES	YES
Observations	910	910	941	941
R-squared	0.452	0.3098	0.5039	0.3929

Notes: The dependent variable in column “Excluding CHN & HKG” is the number of firms investing from country i in country j at time t . In this column, we exclude China and Hong Kong from our sample of host countries. The dependent variable in the column “Number of Affiliates” is the number of overseas affiliates from each home country. The wage ratio is defined as the ratio of host country j wages to home country i wages at time t . Heteroskedasticity-consistent standard errors (White) are in parentheses. ***, **, and * show 1%, 5%, and 10% significance, respectively.

Table 5. High Income versus Low Income

	High Income		Low Income	
	(II)	(IV)	(II)	(IV)
Host GDP	-0.383*	-0.083	0.306**	0.295**
	[0.228]	[0.198]	[0.133]	[0.124]
Host Tax	-0.453	-0.145	-2.017***	-2.018***
	[0.646]	[0.640]	[0.583]	[0.582]
Host Tariff	-5.423**	-6.027**	-1.111**	-1.108**
	[2.457]	[2.464]	[0.487]	[0.486]
WTO	0.419***	0.385***	0.645***	0.648***
	[0.061]	[0.060]	[0.060]	[0.060]
Host Wage	0.440**		-0.238***	
	[0.202]		[0.087]	
Home Wage	0.283		0.202	
	[0.179]		[0.146]	
Wage Ratio		0.038		-0.230***
		[0.130]		[0.078]
Year	YES	YES	YES	YES
Pair	YES	YES	YES	YES
Observations	485	485	456	456
R-squared	0.5225	0.355	0.554	0.4459

Notes: The dependent variable is the number of firms investing from home country i in host country j at time t . The wage ratio is defined as the ratio of host country j wages to home country i wages at time t . Heteroskedasticity-consistent standard errors (White) are in parentheses. ***, **, and * show 1%, 5%, and 10% significance, respectively. The classification of high and low income countries is based on the World Bank classification.