

**Does Korea Follow Japan in Foreign Aid?
Relationships between Aid and Foreign Investment¹**

Sung Jin Kang

Professor, Korea University, Korea

sjkang@korea.ac.kr,

Hongshik Lee²

Assistant Professor, Korea University, Korea

honglee@korea.ac.kr,

Bokyeong Park

Research Fellow, Korea Institute for International Economic Policy, Korea

bypark@kiep.go.kr

December 2009

Abstract

Korea, an emerging donor country, largely considers its economic relations to recipients when allocating its aid. Such practices were preceded by Japan before the 1990s. We expect those similar practices between the two countries will make resemblance in aid outcomes. On a macro level, we show similarities in aid allocations by type, region, income, and sector. The similarities are ascertained also at a micro level by our statistical analysis on the relationships between aid and FDI. The analysis based on the FDI gravity model and panel dynamic system GMM estimation shows that only aids from Korea and Japan create more inflow of FDI into their respective recipient developing countries. Those are contrasted with other donors' aids, which are not related to FDI or the substitute for FDI.

Keywords: foreign aid, foreign direct investment (FDI), aid allocation, Korea, Japan

JEL Categories: F35, F21, O19

¹ We are very grateful for comments from the participants of ICSEAD seminar in March 2008. The authors would like to give thanks to Hyuk-Hwang Kim, researcher of Korea Institute for International Economic Policy for his data arrangement.

² Send Correspondence to Department of Economics, Korea University, Anam-dong, Seongbuk-gu, Seoul, 136-701, Korea, E-mail: honglee@korea.ac.kr, Tel: +82-2-3290-2224, Fax: +82-2-3290-2200.

1. Introduction

In 2010, Korea joined the Development Assistance Committee (DAC) of the OECD, a group of aid donor governments, as its 24th member country. This recent membership is an official recognition from the international community as a considerable donor country. Korea began its contributions to foreign aid in 1987. Korea is now the 2nd recognized Asian donor, following Japan, among a predominately Western list of donor nations. Although Korea has set a target on the size of aid, it has yet to articulate in which direction to develop its aid policy.

Foreign aid intrinsically invokes an altruistic image, but it is far more complex and multi-faceted. For instance, foreign aid aims to help alleviate poverty in developing countries, but at the same time, it is undoubtedly a way for donor countries to advance their national interests. Therefore, most donors face difficulties reconciling these two seemingly conflicting motivations. The combination will be determined by donor nation's internal socio-political factors, international standing, external strategy, geographical calculations, and so forth.

As an emerging donor Korea's foreign aid policy will gradually evolve through its unique internal and external conditions. It is difficult to predict what Korea's foreign aid policy will look like in the future, but it is very interesting to examine whether Korea will follow the path of its Asian predecessor, Japan. Initially, geographical closeness and resemblance in economic structure influenced Korea to use the Japanese experience in foreign aid as a reference. For example, the Japan International Cooperation Agency (JICA) and the Overseas Economic Development Fund (OEDF) were references for the establishment of the Korea International Cooperation Agency (KOICA) and the Economic Development Cooperation Fund (EDCF), respectively.

This study will address whether beyond the institutional resemblances Korea is following its predecessor, Japan in regard to primary direction of aid policy as well. The primary direction of aid policy is what the donor country hopes to ultimately achieve by aid-giving, which is related to how the country reconciles its conflicting motivations of

altruism and national interests. We assume that a donor's primary direction in aid policy is best reflected through its allocation of aid fund. That is, if we can find out specific patterns of the donor's aid allocation, then we can also answer what the goals of its aid are. Based on this assumption, this study will focus on examining whether there are substantial similarities in aid allocation between Korea and Japan. The similarities will be tested through both macro and micro level analyses. Macro level analysis compares the distribution of aggregate aid between the two countries by type, region, sector, recipients' income level, and so on. On a micro level, how foreign aid is related to foreign direct investment (FDI) will be tested using bilateral data. In particular we will test whether foreign aid, which is a kind of public resource, has a catalyzing effect on private foreign investment by using the FDI gravity model and panel dynamic system GMM estimation. In conclusion we insist that there are strong similarities between Korea and Japan with respect to aid allocation, and this is further highlighted by contrasts with other donors.

2. A Macro Comparison: Aid Distributions of Korea and Japan

The total amount of Korea's foreign aid has increased gradually for the last 17 years and reached US\$513 million in 2006, which is shown in Figure 1. This is larger than aid of Portugal or Greece, and is a little less than aid of Finland. The share of ODA in GNI also was as low as 0.02% in 1990, but increased to hover around 0.06% in the 2000s. This level, however, is still much lower compared with most of the DAC members. The share of DAC members, on average, in 2006 was 0.31%, which was about five times as high as that of Korea.

In 2006 Japan provided foreign aid of \$11.2 billion on a net disbursement basis. This size accounted for 0.25% of its GNI. Japan was the third largest donor in the world following the United States and the United Kingdom. The size of Korea's foreign aid is very tiny in terms of total amount or the share in GNI compared with that of Japan. Its total amount is only about one-twentieth, and its share in GNI is about one-fourth of Japan's aid.

Despite a big difference in their sizes, Korea's aid allocation shows a lot of similarities to Japan's to a surprising extent. In particular, Korea's allocation is closer to that of Japan in the second half of the 1980s than now. Table 1 shows the basic picture of aid fund allocations in Korea and Japan. The recent allocation in Korea are compared to those of two periods in Japan, the second half of 1980s and the latest years. The second half of 1980s is selected because Japan's national income per capita during that period was at a similar level to the present one of Korea in nominal value, approximately US\$20,000. In 1988 Japan's national income per capita reached more than US\$20,000 for the first time. In order to avoid the problem of annual volatility in aid allocation, we used five-year averages in every case.

We can easily find out some similarities between Korea and Japan in aid fund allocation. First, Japan's aid is characterized by a large share of loans in bilateral aid in the past and now. Korea's aid also shows the same features, which is shown in the share of loans, 41%. Though its share is not as high as the 63% of Japan in the late 1980s, it is much higher than the average of DAC members, 14%. In addition, if we look at the period of 1998–2001 instead of the latest year when a large amount of Korea's aid temporarily went to Afghanistan and Iraq for war recovery, Korea's share of loans goes up to 69%, which is slightly higher than Japan's share in the late 1980s. In the regional distribution, the two countries show similarities in the high concentration in the Asian region. The 76% of Korea's bilateral aid was provided to developing Asian countries, and similarly, 67% of Japan's aid was given to Asia in the late 1980s. Contrastingly, the shares of aid to Africa by Korea and Japan are as low as 8% and 10% respectively, compared to the DAC average of 29%.

In terms of aid recipients by income we can see a similarity between Korea's and Japan's aid. Korea's aid is characterized by the high ratio of the aid to the middle income countries. In the period 2002–2006 Korea provided 52% of its bilateral aid to the lower-middle-income countries, which contrasts with 30% of the DAC average. When we reasonably expect that the unallocated income countries are likely to fall into lower income groups, its share of aid to three lower income groups including LDCs, other LICs, and the unallocated income countries is 21% points lower than the DAC average. Therefore, Korea's aid allocation by recipients' income is preceded by that of Japan. The

recipient by income in Table 1 shows how close Korea's distribution is to that of Japan in the late 1980s.

In the allocation by sector, Korea seems to be much different from Japan and instead closer to the DAC average. One of traditional features of Japanese aid distinct from other DAC members' is its emphasis on economic infrastructure in the recipient countries. In the late 1980s, more than half of its bilateral aid was allocated in the economic infrastructure sector, and also, in the most recent five years, 45% of its aid went to the same sector. During the most recent five years, Korea showed much different proportions from those of Japan. The economic infrastructure sector accounted for only 29%, whereas about two-thirds of its aid went to the social infrastructure sector. Such a partition, however, is an unusual and temporary outcome which arises from a sharp increase in urgent war relief aid to Afghanistan and Iraq after 2002. During the five years before 2002, the economic infrastructure accounted for 46%, which was instead higher than its social infrastructure share and was as high as Japan's economic infrastructure share.

Finally, in terms of aid-tying, Korea's aid is much different from Japan's. Most of Korea's bilateral aid of the most recent five years, 97% was provided with the condition of tying, which is in sharp contrast to other donors' practices of aid untying. Only 8% of Japanese aid was given with the condition of tying during the last five years. The proportion of tied aid in Japan's aid had been higher than the DAC average until 1981, but after the peak of 74% in 1980, its proportion sharply declined to 32% on average in the late 1980s. Korea's common practice of aid tying seems to be very unusual, even with the comparison to the Japan's past.

In summary, except for size and aid tying, Korea's aid has a close similarity to Japan's aid of the late 1980s in many respects such as aid allocation by type, sector, region, and income. The similarities between the two countries' aid include a high proportion of loans, the regional concentration in Asia, a high share of aid to the middle-income countries, and the emphasis on the economic infrastructure sector.

3. A Micro Comparison: The Relationship between Aid and Foreign Investment

Through basic comparison, we found strong resemblances between the two countries' aid distributions. These resemblances are thought to reflect their high consideration of bilateral economic ties with the recipient country in allocating their aid funds, even though currently such considerations are much less important in Japan. This economy-related aid allocation of these two countries may have created a certain relationship between aid and foreign investment, which is observable in these two countries but doesn't exist with other donors. Therefore, this paper will further explore whether additional similarity between Korea and Japan can be found in regard to the relationship between aid and foreign investment. In particular, we will focus on whether Korea's and Japan's aid have an effect of catalyzing foreign direct investment into the recipient developing countries, and whether the effect, if any, is equally observed in aid from other donors.

3.1. Literature Review

The relationships between official flows and private flows have continuously been a concern in development economics. For instance, international financial organizations such as World Bank and IMF have been very interested in whether multinational lending has a catalytic effect or a crowding-out effect on private capital flow. Regarding the issue, some theoretical and empirical studies were suggested and World Bank (2002, p.98) provides a brief survey of those studies.

There are, however, very few studies about the relationships between bilateral aid and private foreign investment. Alesina and Dollar (2000) compare determinants of aid allocation and FDI location choice using pooled country data, and conclude that aid and FDI are determined by different factors. Strategic factors such as political allies and colonial ties play a significant role in aid allocation, while in the location choice of FDI economic factors such as the enforceability of contracts and openness are considered often. Berthelemy and Tichit (2004) deal with the relationships between aid and FDI more directly. They analyze the determinants of aid allocation by donor and don't find a

significant relationship between aid and FDI flows in most of the donor countries. In contrast, trade relations appear to be reflected in aid allocation. Their causality is in the opposite direction of ours, because they investigate whether donors take into account their overseas investment distribution when providing aid.

Returning to our causality direction from official aid to private capital flows, theoretically we can't determine whether aid will catalyze or dampen private foreign investment. On a theoretical basis, it has both effects: aid may raise the productivity of private capital by financing public infrastructure investments, but it may also have an adverse impact by creating rent-seeking opportunities. Selaya and Sunesen (2008) gain the same result, indeterminacy of aid effect on private investment by distinguishing aid for financing complementary inputs and aid for physical capital transfers.

Empirical studies on the effect of aid on foreign investment show confusing outcomes just as they support the theoretical conclusion. Harms and Lutz (2006) find that controlling for countries' institutional environments, higher aid has no effect on private foreign investment. Unexpectedly, however, the effect is strictly positive when investors face a substantial regulatory burden. Selaya and Sunesen (2008) show different outcomes from those of Harms and Lutz (2006). Their results show that aid invested in complementary inputs such as social and economic infrastructure draws in foreign capital, while aid directly invested in physical capital crowds out private foreign investments.

Both of the above empirical studies are based on the analysis of total aid and total private flows of each recipient. Recently, empirical analyses based on more micro-level data are being attempted by using data of donor-recipient pairs instead of the total values of each recipient. Concretely, while the previous study is to check whether total aid to recipient j increases total foreign investment flows to recipient j , the recent one is to check whether bilateral aid from donor i to recipient j attracts bilateral investment from i to j . Using pooled data by pair and the gravity model of bilateral FDI, Mayer (2006) examines the catalyzing effect of bilateral aid to bilateral foreign investment. The outcomes are not very clear and sometimes inconsistent with the theoretical basis. The bilateral aid appears to have a positive, significant impact on bilateral FDI when only the year fixed effect is imposed, but the significance disappears when the country fixed effect is added. If aid is limited to the aid for economic infrastructure, the impact of bilateral aid

loses its significance and, instead, total economic infrastructure aid received is strongly associated with foreign investment.

Kimura and Todo (2007) use a similar methodology but gain different results. The effect of the total stock of foreign aid from all donor countries to country j on FDI from county i to j is positive but insignificant.³ Also, after separating infrastructure and non-infrastructure aid, the results are the same.⁴ To pool the pair data for five donors and control for fixed effects and endogeneity, the results indicate that foreign aid has no significant effect on FDI from the donor country.⁵ They go further to investigate the effect by donor separately. Only the positive effect of Japanese aid for infrastructure is robust and significant in their estimation, while aid from other donor countries reveals no such effect. Only in Japanese aid is the so-called vanguard effect found, which arises when foreign aid from a particular donor country promotes FDI from the same country but not from other countries. Kimura and Todo (2007) are in the same line with Blaise (2005), which shows that Japanese aid flows did have a significant positive impact on private investors' location choices in China. Kimura and Todo (2007) show originality by including a donor dummy and its interaction terms in the estimation, which reveals the aid effect on foreign investment varying according to donor.

3.2. Configuration of aid and foreign investment in Korea and Japan

Figure 2 shows the trend of overseas investments from Korea and Japan respectively. It is noticeable that the periods chosen for comparison coincide with a booming period of foreign investment in both countries, the second half of 1980s and the years after 2002 in Japan and Korea, respectively. Also, they were the periods when both countries accumulated large foreign reserves and started to increase their foreign aids significantly. This coincidence seemingly implies some possible relationship between aid and FDI in the two countries.

Table 2 shows the top ten host countries of aid and foreign investment from Korea and Japan. Several developing countries, at the same time, are included in the top recipient

³ This result is consistent with Harms and Lutz (2006) based on data of total values by recipient.

⁴ This result is inconsistent with Selaya and Sunesen (2008) based on data of total values by recipient.

⁵ This result is consistent with Mayer (2006) under the condition of the country fixed effect.

groups of both FDI and aid. In 1989, five countries out of Japan's top ten aid recipients were also top-ten host countries for Japan's foreign investment. In 2004 the number reduced to three countries. In the case of Korea as a donor, three developing countries appear in both top ten lists in 2004. It is not obvious whether such overlapping of major receiving countries in FDI and aid indicates a significant relationship between aid and investment. More sophisticated analysis is necessary to certify the relationship.

3.3. Model

In this section, using statistical methods, we will examine whether aid in general has a catalyzing effect on foreign investment and, furthermore, whether aid from Korea or Japan in particular has such an effect as distinguished from aid by other donors. For this estimation, we employ the gravity model of FDI and bilateral country pair data instead of aggregate data of recipients. We choose seven donor countries (the United States, the United Kingdom, the Netherlands, Japan, South Korea, Germany, and France) which are supposed to represent each type of aid according to Table 3. First, in order to check whether the catalyzing effect of aid exists across all donors, we will estimate with pooled country pair data. Then, we will estimate with bilateral data by donor to see whether there are differences in the effect among donors.

We present a formal model to estimate the effect of foreign aid on FDI flows. To provide information on how foreign aid affects FDI, we make use of the knowledge-capital model developed by Carr et. al. (2001). Following the spirit of existing work on the empirics of FDI, we begin with a basic specification. Assume the following FDI determination equation in country i in year t .

$$f_{it} = \alpha_1 + (\alpha_2 - 1)F_{it-1} + \beta'X_{it} + \eta_i + \omega_t + v_{it}, \quad (1)$$

where f_{it} is FDI flows into country i in year t , and F_{it-1} represents accumulated stock of FDI flows until year $t - 1$, which reflects the accumulation effect. X_{it} represents a vector of other independent variables and α_1 , α_2 , and β' are the parameters to be estimated. ω_t

is the time-specific effect, as a fixed, unknown constant, which is equivalent to putting time dummies in the regression. η_i reflects country-specific effect and v_{it} is a well-defined stochastic error-term.

Traditional studies on FDI decisions show four main factors: agglomeration effects, institution effects, production cost effects, and market access effects. First, agglomeration effects might be due to positive linkages between projects. One incentive is the spillover effects created by research and development. The second is confidence and the possibility that firms cluster. For example, firms are not sure as to whether a particular country (region) is a good location for FDI and thus take the success of one firm as a signal of underlying national (regional) characteristics. A third incentive arises from the supply of intermediate goods (see Fujita et al., 1999 for a general overview).

Second, most countries have tried to attract FDI via favorable economic policies, which are called institution effects. They include various institutional reforms, the establishment of special economic zones, and construction of new roads. For China, Chen (1996) and Cheng and Kwan (2000) show that special economic zones and infrastructure (road) lead to lower setup costs for new, local establishments in host countries and thus promote FDI.

Third, lower production costs may contribute to attracting multinationals. Switching from direct exports to local production will bring cost savings through lower factor costs, lower transport costs, and no trade barriers. Obviously, local production can save through avoiding transport costs and trade barriers such as tariffs and other non-trade barriers. Furthermore, for example, local production with collaboration with local firms through joint ventures can decrease the costs of dealing with foreign regulations, taxes, and administration. Theoretical modeling based on distinct firms with increasing returns to scale predicts that FDI is more likely to replace exports the larger is the market, because the plant-specific fixed costs may be spread over more units of output as the market size increases.⁶ In addition, a significant part of multinational activity tends to take the form

⁶ Conventional neoclassical models of MNEs view exports and FDI as substitutes, particularly in the manufacturing sector. In addition, if FDI is directed to industries in which the home country has comparative advantages, then imports and FDI are likely to be positively related. In particular, new products require specific skills and knowledge so that effective maintenance and support can be provided. The home country may also find quality supervision more effective if it directly

of firms shifting a state of their production process to low-cost locations. The economic analysis of this shift is based on the idea that different parts of the production process have different input requirements. For example, it may be profitable to move production of labor-intensive goods to labor-abundant countries, while the headquarter services are left in the home country (Helpman, 1984, 1985; Helpman and Krugman, 1985).

Fourth, there is a market access effect. Larger markets in terms of per capita income will tend to have more local firms, and consequently more intense competition than smaller markets. This will lead to a lower price and will be particularly damaging to the profitability of exporting, tipping a firm's decision in favor of local production (Horstmann and Markusen 1987; Markusen and Venables, 1999).

To shed light on this issue, the choice of control variables is based on the list of determinants on FDI location that are reviewed in related literature. The first group of independent variables is country characteristics. We used the GDP of recipient countries. We expect that FDI flow correlates positively with GDP, consistent with a market-seeking FDI theory. As the second variable, this specification used the difference of per capita GDP between source and recipient countries. We expect its coefficient to be positive in FDI flow, because the factor proportion hypothesis says that firms may decide to relocate the stages of production abroad to take advantage of factor price differences.

The second independent variable is the lagged value of accumulated FDI. This variable reflects agglomeration effects. The third group of independent variables measures perceived costs of exporting to the host country. $DIST_{ij}$ is the geographic distance between i and j , and TAR_i is the average tariff rate for the country. These control variables reflect trade-off relations between FDI and direct exports. As is clear, switching from direct exports to local production provides cost savings by avoiding transport costs, trade barriers such as tariffs, and non-trade barriers.

The fourth group of independent variables is the institutional environment variable that reflects the institution effect, which plays an important role in attracting FDI. As an institutional environment variable, corruption indices of recipient countries are used.

controls the network. Hence, whether exports and FDI are substitutes or complements needs to be resolved empirically.

Finally, we used bilateral exports between source and recipient countries as independent variables. According to FDI literature, there are still debates about the relationship between FDI and exports. There are theoretical reasons to suggest both substitution and complementary effects.⁷

3.4. Estimation method

Give equation (1), we employ the Generalized Method of Moments (GMM) framework to estimate the impact of foreign aid on FDI. Since FDI flows f_{it} can be rewritten as $F_{it} - F_{it-1}$, equation (1) can be rewritten as a dynamic panel regression form:

$$\begin{aligned} F_{it} &= \alpha_1 + \alpha_2 F_{it-1} + \beta' X_{it} + u_{it}, \\ u_{it} &= \eta_i + \omega_t + v_{it}, \quad i = 1, 2, \dots, N, t = 1, 2, \dots, T. \end{aligned} \quad (2)$$

This equation is a dynamic panel regression with a lagged dependent variable on the right-hand side.

It is important to ascertain the serial correlation property of the disturbances in our dynamic model, which is crucial for formulating an appropriate estimation procedure. And, the issue of reverse causality should be addressed. We have to deal with the potential endogeneity issue of both the lagged dependent variable and the explanatory variables arising from the feedback effects of FDI on control variables that are lagged accumulated stock of FDI and other economic and institutional factors in our study. These econometric issues should be properly considered for a model specification and its estimation.

Following Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998), the above-mentioned econometric issues under a generalized method of moments (GMM) framework are considered. Under

⁷ Lipsey and Weiss (1981), Graham (1996), and Kawai and Urata (1998) find that affiliates' sales positively correlated with exports and foreign production. In particular, Lipsey, Ramstetter, and Blomstrom (2000) using Japanese manufacturing firms find that parent companies' exports from Japan to a foreign region are positively related to production in that region by the affiliates of that parent.

appropriate moment conditions, this paper use Dynamic Panel System GMM estimation.

3.5. Data

Bilateral FDI flows are drawn from UNCTAD, which covers 249 countries from 1968 to 2003. Since the data for foreign aid covers seven donor countries from the limited period from 1980 to 2006, we limit our sample to the period from 1980 to 2003 covering the seven donor countries and twenty-four recipient countries (Appendix Table 1). The foreign aid data used in this paper are taken from the OECD.dat database. The data contains the bilateral foreign aid funded to each activity. The dataset provides two types of bilateral foreign aid: the total amount of foreign aid and loans. In this paper we used the total amount of foreign aid. The data is available in annual series from 1980 to 2006. The stock values for bilateral FDI and foreign aid are constructed by getting accumulated values from the initial year of the data under assumption of no depreciation rate and the 1980 value as an initial stock.⁸

Other independent variables are taken from the World Bank: GDP, per capita GDP, exports, and mean tariffs. Distance between two countries is defined as the geographical distance between the capital cities of these countries (kilometers), from Jon Haveman's website.⁹ FDI, GDP, ODA, and Exports are at the 1990 constant prices.

For institutional environment variables, we use corruption Indices, constructed by the International Country Risk Guide (ICRG). The data set has a feature of a panel structure consisting of 3,816 annual observations clustered by 168 country pair groups from 1980 to 2003. The number of observations varies per year and summary statistics for all of the data used in the estimation are presented in Table 4. The data used in the estimation are in log. And the FDI and ODA values are in stock.

3.6. Estimation results

⁸ For estimation, flow values of foreign aid will be used to confirm the robustness of the estimation results. This is because of the construction issues of stock data of foreign aid. For example, it might be appropriate for accumulating the data to get stock variables for general budget support and emergency aid. This is from the comments for the referees.

⁹ <http://www.macalester.edu/research/economics/PAGE/HAVEMAN>.

The estimation results for equation (2) are reported in Table 5. Table 5 presents the estimation results by fixed- and random-effect panel models, and dynamic panel system GMM estimation. Economic variables are shown to be significant independent of the estimation methods, although the size of coefficients is different.

As the most important variable throughout this study, the foreign aid is negatively correlated with bilateral FDI flows. The coefficient, however, is not significant. This indicates that there is no empirical evidence that the more foreign aid to a recipient country creates higher investment to the country in general. The panel estimation, however, here ignores the possible endogeneity of lagged FDI and foreign aid variables so that this possibility might result in biased coefficients.¹⁰

Considering possible endogeneity of independent variables, column (3) shows the estimation results of the panel system GMM estimation. The foreign aid is positively and significantly correlated with FDI flows. This means foreign aid plays a positive role in attracting FDI, generally in the sense that the data used are pooled for all seven donors. Furthermore, the model specification satisfies specification and AR tests.

The estimation results for other independent variables are summarized as follows.¹¹ First, accumulated stock of FDI is positively and significantly correlated with current FDI flows, implying positive linkages among projects: spillover effects, cluster confidence, and uses of intermediate goods.

Second, there is a positive correlation between recipient countries' GDP and FDI at a 1% significance level even though the estimation results for panel estimation are not shown to be significant.¹²

Third, the difference of per capita GDP between donor and recipient countries is

¹⁰ Following the referee's suggestion, the model without lagged FDI stock is estimated. The estimation results for the ODA variable are shown to be positive. This is consistent with the GMM estimation results.

¹¹ For robustness of GMM estimation results, various forms of model specification through recombination of independent variables are estimates as well. The estimation results are quite consistent with those of Model (3) and (4) of Table 5.

¹² This result is very consistent with our expectation. This indicates that FDI flows are more attractive in larger markets, which is consistent with market-seeking FDI. The horizontal FDI states that, given moderate to high trade costs and plant-level as well as firm-level scale economies, multinational activity will occur between similar countries. The fixed costs of two-plant firms are less than double those of a single-plant firm, and therein lies the motive for multinational production.

negative in FDI flow. This result supports the horizontal foreign direct investment model that multinationals arise to take advantage of domestic market of host countries.

Fourth, the tariff level that reflects the trade barrier shows positive and significant effects. This implies that multinationals tend to invest more in the countries with higher tariff rates because they can avoid trade barriers.

Fifth, exports show a negative coefficient, although the results for panel estimation are not significant. The conventional view of the tradeoff in relation between FDI and exports is not supported empirically. Some companies establish subsidiaries that can produce the same products as their parent company. This production results in lower transport costs than direct exports from the parent country, no tariffs, and the seller can more easily adapt to the host country's tastes, customs, and legal requirements. Thus, establishment might result in lower exports directly from the parent country and thus there is substitution between local production and exports.¹³

Finally, the institution environment effect is shown to be positive and significant throughout the whole model specifications. This justifies the view that better institutions, i.e., an environment favorable to foreign multinationals, play a significant role in promoting FDI.

Some of the findings, so far, suggest that foreign aid creates FDI. This analysis can present different impact of foreign aid on FDI flows by each of seven donor countries. Therefore, we further investigate whether foreign aid from each of donor countries actually promotes FDI. As discussed in the previous section, we simply guess that there is different impact by each of four types of foreign aid. Based on this assumption, for example, aid of an economic relation type is highly connected with trade or FDI flows.

Estimates for respective seven donor countries are reported in Tables 6 and 7. Table 6 presents the estimation results by fixed- and random-effect panel models, while Table 7 shows those of the dynamic panel system GMM estimation. The impact of foreign aid on FDI flows shows different results depending on donor countries. As the

¹³ However, there are several reasons to be complementary. Graham and Krugman (1993) argue that, for some industries, FDI is likely to be complementary to trade. Baldwin (1990) suggests that downstream services are typically associated with the level of export sales from the parent country to the host country. Some of these facilities can be set up by locals, although parent country involvement may be beneficial.

estimates in Table 6 indicate, in the random effect panel model, column (2), the foreign aid from Germany, France, Japan and the United States has significant impact on bilateral FDI flows.

After controlling for endogeneity problems, however, the coefficient of the GMM method for these countries except for Japan and South Korea has no significant impact on FDI as well. This implies that bilateral foreign aid from Japan and South Korea has significant impacts on bilateral FDI flows for all estimation methods. This indicates that foreign aid from Japan and South Korea creates bilateral FDI.¹⁴

As discussed in the previous section, on a theoretical basis, it is not obvious whether foreign aid increases or reduces countries' attractiveness for foreign investors. The empirical evidence in this paper shows that foreign aid does not promote bilateral FDI in general. There are different impacts for each donor country according to foreign aid types. Japanese and Korean foreign aid increase bilateral FDI flows.

4. Conclusion

We showed that Korea's current foreign aid practices have strong resemblances to Japan's aid practices of the 1980s. The resemblance was very clear on a macro level as shown in the aid distributions by type, region, income, and sector. Furthermore the similarity was ascertained again, but on a micro level, through an analysis of the relationship between public aid and private investment.

From pooled data of different donors, we could not find a general positive effect of aid on foreign investment inflow, which is consistent with the results of other studies. Our results, however, portray that aid only from Korea and Japan leads to increased foreign investment inflow. The effect was stronger for Korea's aid than Japan's. In

¹⁴ Following the referee's suggestion, six specifications with various combination of independent variables are estimated as well. The coefficients for ODA variable are still robust for those specifications. France, however, shows a significant for ODA variable for the model specification without institution factor and/or tariff. However, the model without lagged FDI stock for respective countries is estimated as well. The estimation results for an ODA variable are shown to be positive for all countries.

contrast, aid from donors other than these two countries served as a substitute for foreign investment rather than a complement. Aid from the Netherlands, which is regarded as highly humanitarian, showed very strong substitute effects.

This vanguard effect of Korean aid seems to reflect its practices in aid allocation. In selecting recipient countries for preferential loans, Korea's Fund Management Committee, which is the supreme decision body, considers their economic ties with Korea to be an important factor, in addition to their economic conditions, needs, and governance. Although it is not widely revealed, particularly candidate countries' investment and trade relations with Korea are taken into account.¹⁵ Because preferential loans account for no less than half of its total aid, such loan allocation criteria will affect the overall structure of Korean aid. In 2008, the Korean government designated eighteen core assistance countries. The selection of those countries largely considers bilateral economic relations to be an important factor (Korean Government, 2008). There is little doubt that how large of a potential a candidate country has of becoming a host of Korea's FDI is one of the important economic factors that are considered. These practices regarding aid allocation in Korea confirm our statistical outcome on the vanguard effect.

The vanguard effect found in aid from Korea and Japan should not necessarily be criticized for using aid as a means to seek investment interests. If aid paves the way for private investment to recipient countries, it is a desirable effect for development finance. Because public aid alone is not enough to finance the sustainable development of a poor country, the catalyzing effect of aid needs to be reinforced. If the effect works only for investment from the donor and, therefore, crowds out investments from others, it is undoubtedly not desirable. Whether aid from Korea and Japan have this adverse effect or not needs to be tested in further studies.

According to our analysis, Korea appears to have followed the past path of Japan in foreign aid so far. This conclusion is supported by both macro and micro analyses. Therefore, if Korea can discover the weakness of Japan's previous aid policy as well as its remedy, then it may avoid repeating Japan's mistakes and shorten the road to effective and appreciated foreign aid.

¹⁵ Park, *et al.* (2008), p. 93.

References

- Alesina, A. and D. Dollar, 2000, "Who gives foreign aid to whom and why?" *Journal of Economic Growth*, vol. 5, issue 1. pp.33–63.
- Arellano, M. and S. Bond, 1991, "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *The Review of Economic Studies*, 58, 277–297.
- Arellano, M. and S. Bover, 1995, "Another Look at the Instrumental Variable Estimation of Error-components Models," *Journal of Econometrics*, 68, 29–51.
- Baldwin, Richard, 1990, "Hysteresis in Trade," *Empirical Economics*, v. 15, iss. 2, pp. 127-42
- Berthelemy, J-C. and A. Tichit, 2004, "Bilateral Donors' Aid Allocation Decisions-a three-dimensional Panel Analysis," *International Review of Economics and Finance*, 13. pp.253–274.
- Blundell, R. and S. Bond, 1998, "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics*, 87, 115-43.
- Carr, D., J. Markusen, and K. Maskus, 2001, " Estimating The Knowledge-Capital Model of the Multinational Enterprise," *American Economic Review*, vol. 91, no. 3 pp. 693- 708.
- Chen, C., 1996, "Regional Determinants of Foreign Direct Investment in Mainland China," *Journal of Economic Studies*, 23, pp.18–30.
- Cheng, Leonard K. and Yum K. Kwan, 2000, "What are the Determinants of the Location of Foreign Direct Investment? The Chinese Experience," *Journal of International Economics*, 51(2), pp.379–400.
- Fujita, M., P. Krugman, and A.J. Venables, 1999, *The Spatial Economy: Cities, Regions and International Trade*, Cambridge, MA: The MIT Press.
- Graham, Edward M., 1996, "The (Not Wholly Satisfactory) State of the Theory of Foreign Direct Investment and the Multinational Enterprise," *Economic Systems*, vol. 20, iss. 2-3, pp. 183-206.

Graham, E.M. and P.R. Krugman, 1993, The Surge in Foreign Direct Investment in the 1980s, K. A. Froot (ed.), *Foreign Direct Investment*, Chicago: University of Chicago Press.

Harms, P. and M. Lutz, 2006, "Aid, Governance and Private Foreign Investment: Some Puzzling Findings for the 1990s," *The Economic Journal*, 116(July), pp.773–790.

Helpman, E. and P. Krugman, 1985, *Market Structure and Foreign Trade*, Cambridge, MIT Press.

Helpman, E., 1984, "A Simple Theory of International Trade with Multinational Corporations," *Journal of Political Economy*, 92, 451–471.

Helpman, E., 1985, "Multinational Corporation and International Trade: Evidence from 14 Industrial Countries," *Journal of the Japanese and International Economics*, 1, pp.62–81.

Holtz-Eakin, D., W. Newey, and H.S. Rosen, 1988, "Estimating Vector Autoregressions with Panel Data," *Econometrica*, 56, 1371–1395.

Horstman, I. and J. R. Markusen, 1987, "Strategic Investments and the Development of Multinationals," *International Economic Review*, 28(1), pp.109–121.

Kawai, Masahiro and S. Urata. 1998. "Are Trade and Direct Investment Substitutes or Complements? An Empirical Analysis of Japanese Manufacturing Industries." In Hiro Lee and David W. Roland-Holst, eds., *Economic Development and Cooperation in the Pacific Basin: Trade, Investment, and Environmental Issues*, Cambridge, UK: Cambridge University Press, pp. 251-293.

Kimura, H. and Y. Todo, 2007, "Is Foreign Aid a Vanguard of FDI? A Gravity-Equation Approach," RIETI Discussion Paper Series 07-E-007.

Korean Government, "The 3rd meeting of the International Development Commission: Proceedings," Jan. 2008 (*in Korean*).

Lipsev, R. and M. Weiss, 1981, Foreign production and exports in manufacturing industries, *Review of Economics and Statistics* 63, 488-494.

Lipsey, R., Eric D. Ramstetter, and M. Blomstrom, 2000. "Outward FDI and Parent Exports and Employment: Japan, the United States, and Sweden" *Journal of the Japanese and International Economies*, Vol. 1, No. 4, pp. 285-302.

Markusen, J.R. and A.J. Venables, 1999, "Foreign Direct Investment as a Catalyst for Industrial Development," *European Economic Review*, 43(2), pp.335–356.

Mayer, Thierry, 2006, "Policy Coherence for Development: A Background Paper on Foreign Direct Investment,"" OECD Development Working Paper No.253.

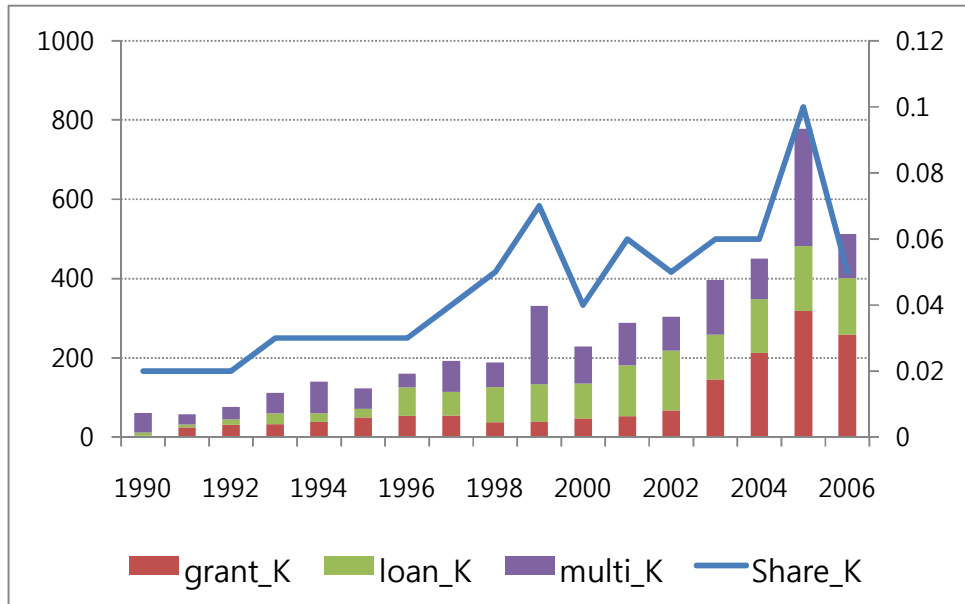
Park, B., K. Lee, S. Lee, J. Chung, and S. Park (2008), *The Assessment of Executive Abilities of Korea as an Aid Donor*, Korea Institute for International Economic Policy (*in Korean*).

Selaya, P. and E. R. Sunesen, 2008, "Does Foreign Aid Increase Foreign Direct Investment?" Discussion Papers No. 08-04, Department of Economics University Copenhagen.

World Bank, 2002, *Global Development Finance 2002*.

Figure 1. Evolution of Korea's ODA

(unit: mil.US\$, %)

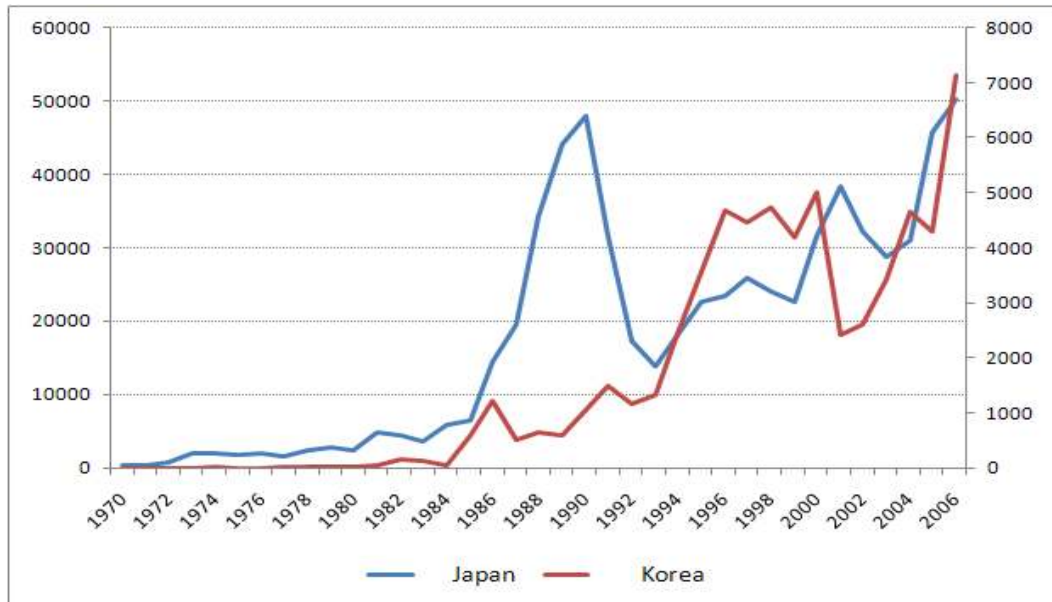


Sources: OECD.dat.

Note: grant_K, loan_K, multi_K, and Share_K denote to be the amount of bilateral grant of Korea's ODA, the amount of bilateral loan of Korea's ODA, the total amount of Korea's multilateral ODA, and the share of Korea's total ODA in Korea's GNI, respectively.

Figure 2. Fluctuation of Overseas Investment Flows from Korea and Japan

(unit: mil. US \$)



Sources: UNCTAD.

Table 1. Comparisons between Korea and Japan in aid allocations

(unit: %)

		Korea	Japan		DAC Average
		2002–2006*	1985–1986	2002–2006	2002–2006
Size	Total (US\$ mil.)	488	7,892	15,426	4,294
	Share in GNI	0.06	0.3	0.23	0.28
Type	Grants	59 (31)	37	53	87
	Loans	41 (69)	63	47	13
By region	Europe	4	2	1	4
	Africa	8	16	10	29
	America	5	8	7	9
	Asia	76	67	60	33
	unspecified	7	7	22	25
By income	LDCs	24	21	16	26
	other LICs	14	12	19	10
	LMIC	52	53	39	30
	UMICs	3	6	4	3
	unallocated	7	8	22	30
By sector	Social Infra	63 (45)	23	36	58
	Economic Infra	29 (46)	51	45	21
	Others	8 (9)	26	19	21
Tying	Share of tying	97	32	8	8

*Values in parenthesis indicate the average of the years from 1998 to 2001. These are presented to correct a shock arising from a temporary rise in the aid to Afghanistan and Iraq after 2002.

Sources: OECD.stat.

Table 2. Top 10 host countries of FDI and Aid from Japan and Korea

Japan				Korea	
1989		2004		2004	
FDI	Aid	FDI	Aid	FDI	Aid
Thailand	Indonesia	China	China	China	Iraq
Malaysia	China	Thailand	Iraq	Vietnam	Vietnam
Indonesia	Thailand	Korea	Vietnam	Slovakia	China
Korea	Philippines	Taiwan	Malaysia	Peru	Cambodia
Taiwan	Bangladesh	Mexico	Philippines	Indonesia	Afghanistan
China	India	Philippines	Sri Lanka	Thailand	Bangladesh
Brazil	Sri Lanka	Indonesia	Afghanistan	India	Indonesia
Myanmar	Pakistan	Brazil	Kazakhstan	Malaysia	Sri Lanka
Philippines	Nigeria	Czech	Pakistan	Poland	Philippines
Pakistan	Kenya	Malaysia	Uzbekistan	Libya	Albania

Sources: Ministry of Finance and Economy Korea; Ministry of Finance Japan; OECD.dat.

Table 3. Typology of Foreign Aid

Size (per GNI) Type	Over 0.5%	0.3–0.5%	Below 0.3%
Humanitarianism	Denmark, Sweden, Norway, Netherlands	Finland, Germany, Swiss, Ireland	
Ex-colony Management	France	Belgium	United Kingdom, Australia, Portugal
Economic Relation		Canada, Austria	Japan, Italy, Greece, New Zealand, Spain
National Security			United States

* The size of aid as a percentage of GNI is as of 2004.

Sources: Park (2008).

Table 4: Data Description

Variable	Description	Mean	Std. Dev.
FDI stock ij	Log of real FDI stock from country j to i	1.36	2.79
ODA stockij	Log of real ODA stock from country j to i	5.64	4.18
ODA flow ij	Log of real ODA flow from country j to i	3.74	4.05
GDP_j	Log of real GDP of donor country j	27.79	1.07
GDP_i	Log of real GDP of recipient country i	24.05	1.65
Diff GDP_ij	Difference in log of Per capita GDP between i and j	9.55	0.77
TAR_i	Log of tariff rates in recipient country i	2.56	0.69
EXP_ij	Log of real export from country j to i	20.85	4.59
ENV_i	Log of Corruption index in recipient country i	1.24	0.43

Table 5
Impact of foreign aid on bilateral FDI flows

	(1) Fixed	(2) Random	(3) GMM	(4) GMM
Lagged Real FDI stock _{ij}	0.838*** (0.024)	0.940*** (0.008)	0.954*** (0.00009)	0.947*** (0.0001)
Real ODA stock _{ij}	-0.004 (0.035)	-0.003 (0.018)	0.027*** (0.0001)	0.020*** (0.001)
Real GDP _i	0.063 (0.145)	-0.014 (0.015)	0.052*** (0.0004)	0.003*** (0.001)
Diff. Per Capita GDP _{ij}	-0.209* (0.106)	-0.066** (0.031)	-0.008*** (0.0004)	-0.025*** (0.001)
TAR _i	0.001 (0.085)	0.099*** (0.025)	0.224*** (0.001)	
Real Export _{ij}	0.044 (0.034)	0.022 (0.024)	-0.015*** (0.0001)	-0.010*** (0.001)
ENV _i	0.234*** (0.072)	0.118*** (0.037)	0.183*** (0.001)	0.255*** (0.001)
DIS _{ij}		0.012 (0.034)		
Constant	-0.922 (3.573)	-0.091 (0.566)	-1.685*** (0.010)	0.107 ()
Observations	3120	3120	3120	3120
R-squared	0.795	0.792		
p-value of AR(1) test			0.0044	0.0044
p-value of AR(2) test			0.1392	0.1292
p-value of Sargan test			0.8146	0.7932

Note1: i denotes a recipient, while j denotes a donor.

Note2: ***, **, and * denote to be significant at 1%, 5%, and 10%

Note3: dependent variable is FDI stock.

Note4: Standard errors are in parentheses.

Note5: Year dummies are included all estimations.

Table 6

Panel Estimation on Impact of foreign aid on bilateral FDI flows by donor country

	(1) Fixed	(2) Random	Obs.
ODA_Stock_ij			
Germany	0.044*** (0.014)	0.029* (0.015)	479
France	0.038 (0.025)	0.055* (0.030)	465
United Kingdom	0.130 (0.083)	0.018 (0.053)	440
Japan	0.123 (0.083)	0.053** (0.023)	445
Korea	0.159 (0.113)	0.081 (0.053)	423
Netherlands	0.037 (0.035)	0.001 (0.017)	462
United States	0.018 (0.030)	0.013** (0.006)	385

Note1: Standard errors in parentheses

Note2: ***, **, and * denote to be significant at 1%, 5%, and 10%, respectively.

Note3: dependent variable is real FDI stock

Table 7

GMM Estimation on Impact of foreign aid on bilateral FDI flows by donor country

	GMM	AR(1)	AR(2)	Sargan test	Obs.
ODA_Stock_ij					
Germany	-0.003 (0.039)	0.0069	0.9016	0.4390	479
France	0.036 (0.030)	0.0483	0.8953	1.0000	465
United Kingdom	0.093 (0.090)	0.0850	0.2165	0.7182	440
Japan	0.178*** (0.028)	0.1080	0.3258	1.0000	445
Korea	0.114*** (0.020)	0.0544	0.1209	1.0000	459
Netherlands	0.024 (0.034)	0.0070	0.4790	0.1747	462
United States	-0.010 (0.025)	0.0425	0.2576	0.8628	385

Note1: Standard errors are in parentheses.

Note2: ***, **, and * denote to be significant at 1%, 5%, and 10%, respectively.

Note3: dependent variable is FDI stock

Note 4: The statistics for AR(1), AR(2) and Sargan test are p-values.

Appendix Table 1
Country List

	Donor country	Recipient country
1	France	Bolivia
2	Germany	Brazil
3	Japan	Chile
4	Korea	Costa Rica
5	Netherlands	Algeria
6	United Kingdom	Indonesia
7	United States	India
8		Cambodia
9		Kazakhstan
10		Sri Lanka
11		Myanmar(Burma)
12		Mongolia
13		Mexico
14		Malaysia
15		Nepal
16		Peru
17		Philippines
18		Pakistan
19		Singapore
20		El Salvador
21		Thailand
22		Turkey
23		Venezuela
24		Zimbabwe