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Is Foreign Aid a Vanguard of Foreign Direct Investment? A Gravity-Equation Approach

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Summary. — This paper investigates whether and how foreign aid facilitates foreign direct investment (FDI) flows into less developed countries. We employ a large data set of source-recipient country pairs and conduct gravity equation-type estimation. Our empirical methodology enables us to examine an effect through which aid from a donor country promotes FDI from the same donor in particular, which we call a “vanguard effect.” We find that foreign aid in general does not have any significant effect on FDI. However, when we allow for differences in the size of aid effects across donor countries, we find robust evidence that foreign aid from Japan in particular has a vanguard effect, i.e., Japanese aid promotes FDI from Japan but does not attract FDI from other countries.

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1. INTRODUCTION

Impacts of foreign aid to less developed countries (LDCs), particularly those on economic growth, have been examined recently to a great extent (Burnside & Dollar, 2000; Easterly, Levine, & Roodman, 2004; Hansen & Tarp, 2001; Rajan & Subramanian, 2005; among many others). Foreign aid also possibly affects foreign direct investment (FDI) inflows to LDCs, since purposes of aid for the donor country often include to encourage FDI to the recipient country of aid. For example, OECD argues that foreign aid can improve investment environment and thus promote FDI (OECD, 2004), and the US government explicitly states that a purpose of foreign aid is to encourage FDI (Congress of the United States, 1997).¹ The Japanese government also argues that a reciprocal relation between FDI and aid helps the development of LDCs' economies (Arase, 1994). Accordingly, the role of aid in promoting FDI has come to the fore in the policy discussion among government officials and development practitioners (OECD, 2006).

There are a few studies which examine the relation between foreign aid and FDI by using cross-country panel data, most notably Harms and Lutz (2006) and Karakaplan, Neyapti, and Sayek (2005). Harms and Lutz (2006) find that the effect of aid on FDI is generally insignificant but significantly positive for countries in which private agents face heavy regulatory burdens. Karakaplan and Neyapti (2005) also find an insignificant effect of aid on FDI, but in contrast to the finding of Harms and Lutz (2006), the results of Karakaplan and Neyapti (2005) suggest that good governance and developed financial markets lead to a positive effect of aid.²

Both Harms and Lutz (2006) and Karakaplan and Neyapti (2005) use aggregate data on FDI and foreign aid for each recipient LDC. This paper extends these existing studies by using less aggregated data on FDI and aid, i.e., data for each source-recipient country pair during the period 1990–2002.

This country-pair dataset allows us to employ gravity equation-type estimation that is often used in recent studies on determinants of FDI such as Egger and Winner (2006), Mody and Razin (2003), Carr, Markusen, and Maskus (2001), and Wei (2000).

We presume that there are possibly multiple channels through which aid affects FDI, and the ambiguous effect of aid on FDI found in the existing studies may reflect the amalgamation of positive and negative effects of aid. These channels include a positive “infrastructure effect” by improving economic and social infrastructure in the recipient country, a negative “rent-seeking effect” by encouraging unproductive rent-seeking activities, both of which are suggested by Harms and Lutz (2006), a positive “financing effect” by improving the ability of the recipient country to finance outflows of profit repatriation from FDI, and a negative “Dutch-disease effect” by distorting resource allocations between tradable and non-tradable sectors (Arellano, Bulir, Lane, & Lipschitz, 2009).

In addition to these effects of aid, this paper proposes that aid has a positive “vanguard effect,” through which foreign aid from a particular donor country promotes FDI from the

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same donor country but not from other countries. For example, if aid for infrastructure from Japan to Thailand facilitates FDI flows from the United States to Thailand, this might be because the Japanese aid has an infrastructure effect. However, if aid from Japan to Thailand promotes FDI from Japan in particular without affecting FDI from other countries, we conclude that the Japanese aid has a vanguard effect.

There may be several reasons for this vanguard effect. First, when foreign aid is provided, information on the local business environment of the recipient country can be exclusively transmitted to firms of the donor country. Second, the fact that the government provides aid may reduce the recipient country's investment risks perceived subjectively by firms of the donor country. Third, aid may bring the donor country-specific business practices, rules, and institutions into recipient countries. Those effects of foreign aid should promote FDI from the same donor country but does not necessarily promote FDI from other countries.

We isolate the vanguard effect of aid from other effects by estimating the effect of aid from a particular donor country, rather than the total aid from all donor countries, on FDI from the donor. It should be emphasized that the use of country-pair data enables us to investigate the vanguard effect, and thus the distinction of the vanguard effect of aid on FDI from other effects is a major contribution of this paper. Empirical investigation of the vanguard effect is important in practice, since aid is often motivated by the donor country's willingness to encourage FDI from the donor, as we noted earlier.

In addition, we distinguish between aid for infrastructure and aid for other purposes to examine possible differences in the size of aid effects between the two types of aid, since the two types may differently affect each type of effect of aid explained earlier. The distinction between the two types of aid has also not been done in the existing studies.

To preview the results, we find that foreign aid in general does not necessarily promote FDI, a result consistent with Harms and Lutz (2006) and Karakaplan and Neyapti (2005). We also find that either aid for infrastructure or for non-infrastructure has no significant impact on FDI. As to the final role of foreign aid on FDI, the vanguard effect, we find no general evidence of such effect. We then further examine possible differences in the size of the impact of aid among donor countries. Our results show that foreign aid for infrastructure from Japan has a vanguard effect, while the effect of aid from all other countries on FDI seems to be absent. In other words, infrastructure aid from Japan promotes FDI from Japan to the recipient country of aid, while having no impact on FDI from other countries to the recipient.³ The size of the vanguard effect for Japanese aid is large, since our results imply that 6% of Japanese FDI in East Asia during the period 1990–2002 is attributed to Japanese aid.

The rest of the paper is organized as follows. Section 2 specifies the econometric model, whereas Section 3 describes the data and variables. Section 4 shows the estimation results, which is followed by concluding remarks in Section 5.

2. THE ECONOMETRIC MODEL

(a) Estimation equation

To estimate the impact of foreign aid on FDI, we incorporate foreign aid variables to gravity equation-type regression. Our gravity-equation framework can be regarded as an extension of Harms and Lutz (2006) and Karakaplan and Neyapti (2005), who examine the impact of foreign aid on FDI by

employing the total amount of aid from all donor countries to each recipient country as the key independent variable and the total amount of FDI inflows to the recipient as the dependent variable. In contrast, our gravity-equation framework allows us to use foreign aid and FDI between each source-recipient country pair for estimation.

In particular, we employ a simplified version of econometric specifications used in Egger and Winner (2006) and Carr *et al.* (2001) that are based on the knowledge-capital (KK) model developed in Markusen (2002). The KK model suggests that the size of the host country's economy should positively affect the extent of horizontal multinationals that produce their products for the host-country market, whereas the size of the home country's economy should positively affect the extent of vertical multinationals that export their products to the home-country market.⁴ The KK model also suggests that a larger difference in skilled-labor abundance between the home and the host country provides a greater incentive for firms in the home country to relocate labor-intensive production processes to the host country and hence raises the extent of vertical FDI. In addition, following Egger and Winner (2006), Mody, Razin, and Sadka (2003), and Wei (2000), we assume that geographic distance between the home and host country impedes FDI flows.

These arguments made above and our further presumption that FDI flows are persistent lead to the following dynamic gravity equation to estimate the determinants of FDI:

$$\begin{aligned} \ln FDI_{ijt} = & \rho \ln FDI_{ijt-1} + \beta_1 \ln AID_{jt-1} + \beta_2 \ln GDP_{it-1} \\ & + \beta_3 \ln GDP_{jt-1} + \beta_4 \ln DIST_{ij} + \beta_5 SKDIF_{ijt-1} \\ & + \beta_6 SKDIF_{ijt-1}^2 + \alpha_{ij} + \alpha_t + \varepsilon_{ijt}, \end{aligned} \quad (1)$$

where subscripts i , j , and t denote, respectively, the source and the recipient country of FDI and foreign aid and the time period. The dependent variable, $\ln FDI_{ijt}$, is the logarithm of the inflows of FDI⁵ from country i to j at time t , whereas our key independent variable, $\ln AID_{ijt-1}$, is the log of the real value of foreign aid flows from country i to j at time $t - 1$. As we will explain below, we will experiment with several alternative measures of foreign aid for estimation. We take the first lag of foreign aid to incorporate possible time lags between the provision of aid and the decision on FDI. Using the first lag also alleviates possible endogeneity due to simultaneity, although we correct for such endogeneity by using instruments as we will explain later. GDP_i and GDP_j represent GDP of country i and j , respectively, $DIST_{ij}$ the geographic distance between i and j , and $SKDIF_{ijt-1}$ a measure of skilled-labor abundance in country i relative to j .⁶ α_{ij} , α_t , and ε_{ijt} are country pair-specific fixed effects, year-specific effects, and an error term, respectively.

(b) How does foreign aid affect FDI?

Harms and Lutz (2006) argue that foreign aid has two effects on FDI flows. On the one hand, foreign aid improves the recipient country's infrastructure, including "encompassing roads, telephone lines and electricity as well as less measurable items like education or a reliable and well-functioning bureaucracy," (an earlier version of Harms & Lutz, 2006) and hence raises the marginal product of capital in the country. Therefore, foreign aid encourages FDI inflows to the recipient country of aid. We label this positive effect of aid as the "infrastructure effect."

On the other hand, Harms and Lutz (2006) also argue that foreign aid may encourage unproductive rent-seeking behaviors in the recipient country, leading to a drop in productivity.

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