Are Bilateral Investment Treaties and Development Aid Policy Substitutes for Promoting FDI Activities in Developing Economies? Evidence from Japanese Multinational Companies

Marie-Ann Betschinger, State University-Higher School of Economics

Pokrovsky Boulevard 11

109028 Moscow, Russia

e-mail: betschinger@gmx.de

Are Bilateral Investment Treaties and Development Aid Policy Substitutes for Promoting FDI Activities in Developing Economies? Evidence from Japanese Multinational Companies

Abstract:

Japanese development aid disbursements and bilateral investment treaty (BIT) ratification behavior are considered as two alternative foreign economic policy devices supporting Japanese businesses abroad. It is hypothesized that they replace each other in their capacity to promote Japanese foreign direct investment (FDI) in developing and emerging economies. The results show that they both exert a positive influence, but BITs only robustly in reduced sample specifications. There is robust evidence that the capacity of a BIT to act as an investment safeguard is lower when foreign aid is high and vice versa.

.

1 Introduction

Many developing and emerging economies are insecure places to invest for foreigners due to poor contract enforcement and the unpredictability of business related rules. To promote foreign direct investment (FDI) activities both the investment host and investor home governments can design policies to encounter these problems. Host governments, among others, liberalize trade and capital flows, set up investment promotion agencies, improve infrastructure and set investment incentives (e.g., Charlton, 2003, Desai, Foley, & Hines, 2006, Harding & Javorcik, 2007, Kobrin & Wu, 2005). Investor home governments can provide for investment guarantee schemes or carry out targeted development aid to support their businesses abroad (Blaise, 2005, Harms & Lutz, 2006, Kimura & Todo, 2007, UNCTAD, 2001). Jointly, governments frequently decide to conclude bilateral tax or investment agreements (Aisbett, 2007, Blonigen & Davies, 2004, Busse, Königer, & Nunnenkamp, 2008, Davies, Norback, & Tekin-Koru, 2007, Egger & Merlo, 2007, Egger & Pfaffermayr, 2004, Hallward-Driemeier, 2003, Neumayer, 2006, Neumayer & Spess, 2005, Tobin & Busch, 2007).

Although substantial research on investment policy effectiveness has been carried out, the existing literature has not sufficiently considered how these policy options interact with each other in terms of FDI promotion. To fill this gap the study highlights two home government policies, explores their FDI effects, and analyses to which degree they replace or supplement each other in their impact. The focus is on bilateral

investment treaties (BITs) and development aid. While BITs are explicitly concluded between the governments of the investor home and investment host countries to improve FDI treatment and protection(Guzman, 2001), development aid has more indirect implications for FDI activities: Besides creating the infrastructure necessary for investments, business related rules can be transmitted from the donor to the recipient nation increasing familiarity and transparency for investors. Also, aid disbursements can be understood as safeguards created by the donor government – once the FDI of its investors experiences unfair treatment, a government can threat to withdraw disbursements or decrease them in the future (Asiedu & Villamil, 2002).

In the *empirical literature* the positive impact of BITs on FDI has been confirmed in some studies, but been challenged in others. Differing results stem from varying samples, variable specifications, and estimation methodologies (e.g., Aisbett, 2007, Busse, Königer, & Nunnenkamp, 2008, Egger & Merlo, 2007). Those agreements with strong dispute settlement devices have been found to be of larger importance (Yackee, 2006). Desbordes and Vicard (2007) reveal that the conclusion of a BIT can mitigate a bad international positioning of a country with respect to FDI effects and vice versa. Evidence with respect to the ability of a BIT to substitute for a weak domestic environment is controversial (Busse, Königer, & Nunnenkamp, 2008, Neumayer & Spess, 2005, Tobin & Busch, 2007, Yackee, 2006). The positive role of aid for FDI has only in the case of Japan as the donor nation been unconditionally supported (Blaise, 2005, Kimura & Todo, 2007). Also, Harms and Lutz (2006) find that whenever an

investment host country has a high regulatory burden such a positive relationship for FDI in general is given.

One major challenge that arises in empirical FDI policy research is to find an *appropriate measure for FDI activities* in developing and emerging economies. The interpretation of financial figures has been criticized due to differences in data-reporting and the fact that financial investment often does not translate into productive activities in a country (e.g., Lipsey, 2007, UNCTAD, 2006, UNCTAD, 2007). Since reliable data measuring the productive FDI activities on a cross-country basis over a longer time period is not available, this study analyses Japanese investments focusing on the employment generated in their overseas affiliates. *Japan* is not only one of the top-five investor nations worldwide and has an unusual high share of investment within developing and emerging economies (UNCTAD, 2006), but the Japanese government is also known for strongly supporting its companies abroad (Hatch & Yamamura, 1996, Katzenstein, 2005). *Employment* should provide a good measure for capturing the production carried out by Japanese MNES in developing countries as FDI is expected to be primarily labor-seeking due to factor price differentials. Also, in terms of policy analysis multinational enterprise (MNE) employment has been highlighted as one means through which FDI spillover takes place (e.g., Asiedu, 2004).

The results of the estimations in an industry-country-year panel set-up for the period 1990-2004 including 23 industries and 135 developing and emerging FDI destination

countries show that both BITs and foreign aid exert a positive influence on Japanese affiliate employment, but BITs only robustly when the affiliates included in the calculation of the industry-country-year FDI measure are restricted to those of larger size. There is robust evidence that BITs and foreign aid indeed substitute for each other in their capacity to promote FDI activities.

The paper is structured as follows: First, Japanese BITs and foreign aid spending developments are introduced. The theoretical background is discussed and the hypotheses derived. After presenting the methodology and econometric model, the major findings are highlighted.

2 Institutional Background

Since the first *BIT* was signed between Germany and Pakistan in 1959, BITs have proliferated strongly worldwide and by 2006 amounted to 2,573 (UNCTAD, 2007). Nevertheless, Japan has remained the industrialized country that has signed the lowest number of BITs (UNCTAD, 2007). The major reason for this is that *Japan* has in the past actively promoted a multilateral solution for FDI rules (METI, 2007, Pempel & Urata, 2006, Urata & Solis, 2007). Also, while BITs were a precondition for aid or investment insurance in many countries as Germany or France (Konno & Tsukamoto, 2008), Japan sought conclusion of BITs to support aid or investment insurance (Sagara, 2003). However, it seems as if the need for this support was not

too often "perceived", or if it was, other reasons inhibited higher BIT activism such as the political system of the possible partner countries during the 1980s and the relatively high standards set by the Japanese government with respect to the minimum level of BIT contents (Matsui, 1989). Only when multilateral investment negotiations within the OECD and also WTO stopped at the end of the 1990s (Graham, 2000, Gugler & Tomsik, 2007, Sornarajah, 2004), and the major industrial nations increased their efforts in expanding networks of bilateral and plurilateral trade and investment agreements, the strategy changed (Pempel & Urata, 2006).

Japan has up to date ratified thirteen BITs of which most have been concluded after 1996. One more has been signed in 2008 and four are under negotiation. Furthermore, Japan has since 2002 started to conclude the so called economic partnership agreements (EPAs) which include both trade and investment issues (Table 10 in the appendix on details).[1]

---

[1] Although the conclusion of BITs started rather late, 27 Commercial Conventions were concluded between 1958-1980 Matsui, Yoshira. 1989. Japan's International Legal Policy for the Protection of Foreign Investment. *The Japanese Annual of International Law*, 32: 1-17, Yanase, Shuji. 2003. Bilateral Investment Treaties of Japan and Resolution of Disputes with Respect to Foreign Direct Investment.In Berg, Albert Jan van den, editor, *International Commercial Arbitration: Important Contemporary Questions, ICCA International Arbitration Congress*. The Hague, London, New York: Kluwer Law International., of which nine had developing economies as partner economies. Being relatively broad agreements covering trade and investment issues, the rules on investment were rather weak and due to a lack of procedural provisions only had limited effect Matsui, Yoshira. 1989. Japan's International Legal Policy for the Protection of Foreign Investment. *The Japanese Annual of International Law*, 32: 1-17, Sakurai, Masao. 1996. Japanese law and policy for globalization of industry and the

Despite the small number of BITs in which Japan is directly involved, those that have been concluded are of relatively strong nature with respect to treaty contents. The definition of FDI for which BITs apply is wide. Also, international dispute settlement mechanisms for solving conflicts between the investor and the host country have always been included in the treaty design. All BITs encompass provisions on investment protection, transparency enhancement and dispute settlement procedures. Since 2002 FDI entry liberalization clauses are included.

Japan has been, after the US, the second largest *bilateral aid donor* worldwide measured in overall net official development assistance (ODA) disbursements for the past years (OECD, 2006).[2] Nevertheless, in 2000 due to the economic downturn and reduced support from the public, first budget cuts occurred (Solis & Urata, 2007). Overall, Japanese ODA is heavily concentrated on East Asia, while Africa, which is the focus of ODA from other donors, obtains a relatively low amount of aid. Also, the sectors which benefit most from Japanese ODA differ from those of other nations.

---

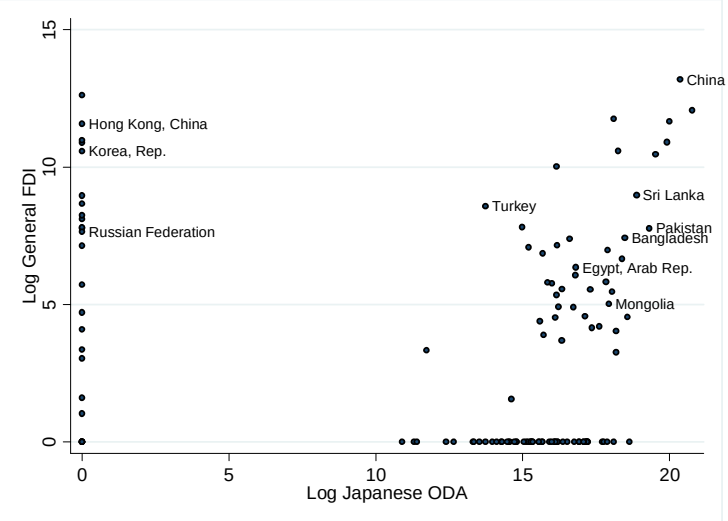
corporation: measures for relief from investment and trade frictions.In Young, Michael K. & Yuji Iwasawa, editors, *Trilateral perspectives on international legal issues: relevance of domestic law and policy.* New York: Transnational Publishers..

[2] Foreign Aid has seen several definitions. The definition applied in this study refers to the one used by the Development Assistance Committee (DAC) of the OECD on official aid (OA) and official development aid (ODA) (OECD 2007). Grants or loans to developing countries that are provided by the official sector to promote economic development at concessional financial terms as well as technical assistance and commodities fall within this definition. However, in the following no distinction is made between aid to developing countries (ODA) and to richer countries (OA) terming all flows ODA.

Japan is the donor with the highest proportion of economic-sector targeted ODA – it amounted to 33.2% in 2004 while the US allocated a share of 19.9% to economic ODA and France of 6.4% (OECD, 2007).

Figure 1 illustrates the *relationship between Japanese ODA disbursement and BIT negotiation behavior* in terms of the distribution of partner countries for 2003.

Figure 1: Relationship between General FDI, Japanese ODA, and BITs



Notes: The sample and variable specifications are used as in the empirical analyses. See 4.2 for details. General FDI data is of 2004, Log Japanese ODA data of 2003. The countries which have concluded a BIT with Japan by 2003 are labeled. Markers refer to all developing and emerging economies in the sample.

Most of the BIT partner countries (labeled) obtain a large amount of ODA – or the complete opposite which is none at all. The latter countries either have surpassed the

need of obtaining ODA as in the case of Korea and Hong Kong both being classified as high-income countries by the World Bank. Or, as in the case of Russia as a middle-income country, reasons are found in the history of being part of the Soviet Union. Some countries which are very important destinations of Japanese FDI activities such as Vietnam, Mexico, Thailand, the Philippines, and Indonesia receive or have received high levels of ODA, but have not ratified a BIT until 2003 (the end of the investigation period of this study). However, many of these countries have either concluded or signed BITs or EPAs afterwards or are in the process of negotiating the latter.

Hence, there is some indication that ODA disbursements and the agreements could partially replace each other in their role as investment safeguards and instrument of transparency creation.

3 Theoretical Background & Hypotheses Development

Capturing the *determinants of FDI* has been subject of numerous theoretical and empirical studies (for overviews see e.g., Blonigen, 2005, Chakrabati, 2001). Based on different FDI theories, Dunning (e.g.,1980) in his eclectic OLI paradigm distinguishes three sets of FDI determinants – ownership characteristics (O), location advantages (L), and internalization arguments (I).

BITs and foreign aid are elements shaping the location advantages of a country. Both improve the *institutional environment*. The latter is crucial as it forms "the set of

fundamental political, social and legal ground rules that establishes the basis for production, exchange and distribution" (Davis & North, 1971). In the case of a highly uncertain environment, firms are expected to avoid ownership and large-scale involvement as companies have a higher risk premium when property rights and contracts are poorly enforced, when the investment environment is unpredictable, and when low quality institutions increase information asymmetries (Henisz & Williamson, 1999, Teece, 1986, Williamson, 1991, Williamson, 2000).

To increase credibility and overcome the problem of time inconsistent behavior, investment host country governments can agree to conclude *BITs* and delegate authority of investment protection to them (Guzman, 1998). Reneging on an international agreement leads to higher costs than in the case of a purely domestic pledge due to a loss in international reputation and the fact that there is a higher possibility of detection of non-compliance as a result of additional monitoring through foreign governments and domestic parties benefiting from their country's international reputation (Guzman, 2001, Martin & Simmons, 1998, Sykes, 2004, Teece, 1986). Sanctions can be imposed in those areas not explicitly concerned by the breach, but of greater relevance and thus more costly for the country. Hence, when property rights protection is important for firms BITs as international agreements that explicitly deal with property rights issues are expected to be of relevance.

Hypothesis 1: BITs will lead to a rise in FDI activities.

Aid can also improve the institutional setting by creating safeguards. Asiedu and Villamil (2002) argue that the enforcement of private contracts is limited to the private creditor's ability to impose negative sanctions as there is no multilateral agency that can guarantee contract enforcement. In this context investors' home governments can step in as intermediates and use foreign aid both through subsidized debt and grants to impose these sanctions. Kimura and Todo (2007) call this the "vanguard" effect of aid also highlighting the information generating and transparency enhancing role that results from the transplantation of business system from the donor to the aid-recipient.

A large literature has, moreover, analyzed the relationship between aid and economic growth – which could indirectly have implications on the FDI attractiveness of a country. The literature is largely based on the "two-gap" model of Chenery and Strout (1966). The first gap emerges when a country cannot finance all those investments which would be necessary to achieve a certain rate of growth on its own as a result of a low level of domestic savings. The second gap arises when the actual foreign exchange earnings and the import requirements needed to attain a certain level of production differ. Here, aid is assumed to replace missing savings or earnings and lead to economic growth. Nevertheless, the impact of aid on economic growth is debated. Rajan and Subramanian (2005) in their review of the empirical literature on the link between aid and growth conclude that there is no robust evidence.

A negative effect on FDI could result from the incentives set for rent-seeking through aid-giving and the use of resources solely for this purpose, and not for improving productivity (Svensson, 2000). However, Svensson (2000) also shows in his game-theoretic analysis that this risk is reduced when aid is disbursed systematically over a longer period of time. Such aid disbursement behavior makes it easier for the differing groups to cooperate lowering the overall level of rent dissipation. As Japan has shown quite stable aid disbursements and commitment over time, the positive effects can be expected to outweigh the negative rent seeking effects.

Hypothesis 2: ODA positively influences FDI activities.

Until now, the role of ODA has been omitted in the research on BIT effectiveness, and vice versa, although both are home government tools that, in theory, are claimed to increase the willingness of the host government to honor private investment agreements, to treat the investment fairly, and to raise the transparency of investment rules. Therefore, it is hypothesized that in the case when BITs are not concluded, foreign aid should work as an alternative foreign economic policy tool to indirectly protect and promote investments, and, vice versa, when BITs are concluded, the role of foreign aid disbursement for investment protection should diminish.

If aid would primarily influence FDI via its positive effect on economic growth, the two policies should be complementary and the interaction between the two positive. But as the empirical literature on the link between aid and growth provides no robust support for such a positive relationship (see above), a negative interaction effect is

expected.

Hypothesis 3: Japanese foreign aid disbursements and Japanese BITs act as substitutes with regard to their role as investment safeguards.

4 Empirical Set Up

4.1 Methodology

As FDI, measured as the employment of Japanese affiliates abroad - the dependent variable y in the empirical analysis, is a partly continuous non-negative variable with a positive probability mass at zero, least squares estimation is inconsistent (Wooldridge, 2002). A *tobit model*, handling such corner solution outcomes, is applied incorporating information on the decision to enter a country and on the scale of FDI activities in the country (for the use of tobit in the case of FDI see e.g., Buch & Lipponer, 2007, Carr, Markusen, & Maskus, 2001, Zhou, Delios, & Yang, 2002).

Since the tobit regression coefficients only measure the impact of the explanatory variables on the latent dependent variable y^*, *marginal effects* are calculated to interpret the impact of the explanatory variables on the expected value of the dependent variable y. These can be decomposed into the impact of an explanatory variable x^k on the change in the dependent variable y given that positive values are observed and the change on the probability that the observation is positive weighted

by the expected value of y if above zero (McDonald & Moffitt, 1980). [3]

$$(1)\ \frac{\partial E[y|X]}{\partial x^k} = P(y>0|X)\cdot\left(\frac{\partial E(y|X,y>0)}{\partial x^k}\right) + E(y|X,y>0)\cdot\left(\frac{\partial P(y>0|X)}{\partial x^k}\right).$$

Defining z as

$$(2)\ z = \frac{\beta' X}{\sigma}\ ,$$

where $\hat{\sigma}$ is the estimated standard deviation of the regression – in the panel context calculated as the root of the estimated variances of the country-industry specific effects λ_{ij} and the time varying idiosyncratic error u_{ijt} – and after further transformations (McDonald & Moffitt, 1980, Wooldridge, 2002), the three following marginal effects for interpretation purposes are reported in the output tables:

$$(3)\ \frac{\partial E(y|X)}{\partial x^k} = \Phi(z)\cdot\beta^k \text{ as } e,$$

$$(4)\ \frac{\partial E(y|X,y>0)}{\partial x^k} = \beta^k\left(1 - z\phi(z)/\Phi(z) - \phi(z)^2/\Phi(z)^2\right) \text{ as } y,$$

$$(5)\ \frac{\partial P(y>0|X)}{\partial x^k} = \phi(z)\cdot\frac{\beta^k}{\sigma} \text{ as } p.$$

[3] For binary variables (e.g., entry into force of an agreement), the difference between the value when the variable takes the value 1 and when it is 0 is taken.

If not otherwise noted, the effects are measured at the means of the explanatory variables following the conventional literature. In order to get inference on the marginal effects, the delta method is used. When including the interaction term between aid and BITs, the marginal effect of each of the interacted variables is adjusted (Brambor, Clark, & Golder, 2006, Braumöller, 2004, Norton, Wang, & Ai, 2004). Appendix 1 provides the derivations.

4.2 Empirical Model and Data

To test for the relevance of BITs, development aid, and the relationship between the two in terms of their FDI impact, a *country* i- *industry* j-*year* t *panel* is constructed. Using panel data has the major advantage that omitted variable bias is reduced as unobserved heterogeneity can be accounted for. The sample includes 135 developing and emerging countries i over 23 manufacturing, primary sector and service industries j for the years t 1990-2004 leading to a total number of observations of $n = \sum_{t=1}^{T} N_t = 42{,}067$ based on about 3,105 unique country-industry pairs N_t. All those countries are included in the set-up that were classified by the World Bank as low and middle income countries in 2005 according to their gross national income (GNI) per capita (World Bank 2007) as well as a selected number of high income emerging economies (Table 6 in the appendix).

The following empirical model is estimated:

$$(6)\ Y_{ij(t+1)} = \max\begin{pmatrix} 0, \alpha_0 + \beta_{BIT} BIT_{it} + \beta_{ODA} ODA_{it} + \beta_{INT} ODA_{it} \cdot BIT_{it} \\ + \beta'_{C_E} C^E_{it} + \beta'_{C_P} C^P_{it} + \beta'_T T_{t+1} + \varepsilon_{ij(t+1)} \end{pmatrix}$$

The explanatory variables are all lagged by one period to mitigate the reverse causality problem. The error term $\varepsilon_{ij(t+1)}$ consists of the time varying idiosyncratic error $u_{ij(t+1)}$ and the country i - industry j, but time unvarying random effect λ_{ij}. For tobit both fixed and random effects specifications have been developed, but tobit regressions with fixed effects lead to a substantial bias in the estimated variances subsequently underestimating the standard errors to such a degree that a random effects or pooled data analysis is recommended (Greene, 2004). Carrying out likelihood ratio tests on the model with and without the unobserved effects, the random effects specification is preferred to a pooled model.

FDI activities are measured using information on the employment of Japanese subsidiaries in the selected countries, which is aggregated on the industry-host country level. Data stems from the *Toyo Keizai's* annual compendia on Japanese overseas investment (ToyoKeizai, Annual volumes 1990-2005) which provide microdata of the subsidiaries of Japanese firms abroad. The dataset is compiled annually from surveys and is supplemented with information from annual reports and media announcements. The survey is sent out to both listed and non-listed firms and thus covers investments by small, medium-sized and large businesses. It reputedly represents the total of Japanese foreign investment activity (e.g., Delios & Henisz,

2003, Makino, Beamish, & Zhao, 2004).

The *dependent variable* Y_{ijt} is thus the maximum of zero (no investment) and the natural logarithm of the affiliate level employment aggregated on the *host country* i-*industry* j-*year* t level.

$$(7)\ Y_{ijt} = \log \sum_{p=1}^{P} \%\ Japanese\ ownership\ (\min .10\%)_{ijtp} \cdot Affiliate\ Employment_{ijtp}$$

The employment of each subsidiary is multiplied with the share of overall Japanese parent firm p ownership in the subsidiary. If several Japanese firms invested in the affiliate, the sum of their ownership stakes was used. Only employment in those subsidiaries is considered for the two measures in which Japanese firms own at least 10% following the OECD and IMF in their FDI benchmark definitions (IMF, 1993, OECD, 1996). The resulting "Japanese employment" figures are then aggregated over industry j in country i in year t. Two dependent variables are formed: Large-scale FDI Y_{ijt}^{ls} only includes the employees of large-sized investments with at least 100 Japanese FDI employees, and general FDI Y_{ijt}^{ge} ,on top of these, counts also the ones of the smaller-sized subsidiaries with a minimum level of Japanese employment of two. In order to reduce the skewness in the data, both FDI measures are transformed with a natural logarithm (Table 5 in the appendix shows descriptive statistics of general FDI). Though Y_{ijt} are not stationary, the Johansen Cointegration test shows that at least one cointegration relationship with the chosen explanatory variables exists.

The ratification of a *BIT* with Japan is accounted for with a dummy variable which is 1 if the destination country i has ratified a BIT with Japan in or prior to year t (*Jap. BITs)*. Otherwise it is 0. Three different specifications for *development aid* are used. In the base regression the natural logarithm of Japanese official development aid disbursements (*Log Jap. ODA*) in the respective host countries is added including both grants and loans. If in certain years no value for Japanese ODA spending was indicated for a country, zero Japanese ODA disbursements were assumed. Negative flows due to the repayment of loans were set to zero after the positive values had been transformed. In a robustness check the negative values and countries without ODA flows are omitted *(Log Jap. ODA w/o 0)*. Furthermore, the natural logarithm of the Japanese aid per capita value is used instead of the total flows also excluding the negative and zero observations (*Log JapODApc)*. To test for the relationship between the two policies the interaction term *INT* between *BIT* and *Jap. ODA* is added.

Due to the fact that the OLI paradigm in itself contains a number of theories on FDI determinants, it is impossible to fully incorporate these as control variables in an empirical framework (e.g., Brenton, Di Mauro, & Lücke, 1999). Hence, the choice of economic control variables included in the vector C_{it}^{E} is motivated by gravity reasoning (Carr, Markusen, & Maskus, 2001, Helpman, Melitz, & Yeaple, 2004). For explaining production of MNEs abroad, the market size, the factors enhancing or restricting transactions among two countries, and factor endowment differences have been included in the models. In this study a specification by Buch et al (2005) is

applied. Larger host economies, proxied by the natural logarithm of the gross domestic product (*Log GDP*), are proposed to attract more market-seeking FDI. Transaction costs relating to geographic, but also institutional distance are measured using the natural logarithm of distance (*Log Distance*). A negative relationship is predicted due to the nature of the dependent variable, employment, capturing labor-seeking FDI (e.g., Egger & Pfaffermayr, 2004). Factor endowment differences are proxied via a measure for the economic similarity of the host countries and Japan (*Similarity*) calculated as the host country's GDP per capita divided by the Japanese GDP per capita (Buch, Kleinert, Lipponer, & Toubal, 2005). Cost reduction motivated FDI will occur when countries are dissimilar in factor costs while market motivated FDI will happen in the case of similar countries. Thus, the similarity measure also serves as a proxy for wage differentials between Japan and the host economy. Again, a negative coefficient is predicted. A country's openness to trade measured as trade related to GDP (*Trade openness*) has also been highlighted as being strongly positively related to FDI in an extreme-bound analysis (Chakrabati, 2001) and is thus included in the regression. Further economic control variables are added during sensitivity checks.

The vector C_{it}^{P} captures the political context. The *domestic institutional political environment* of each host country at time t is measured by the political constraints index (*POLCON*). The index captures "the extent to which a change in the preferences of any one actor may lead to a change in government policy" (Henisz,

2002). The larger the value, the more constraints exist and the more difficult it becomes to change policies making the business environment more predictable for the firm. As an alternative measure the International Country Risk Guide (ICRG) composite index (*ICRG*) is applied. It ranges from 0-100 while 0 refers to high risk and 100 to low risk (PRS, 1996). The ICRG Index addresses political risk in general. To account for a country's trade policies and its commitments to open markets, a dummy for WTO membership (*WTO member)* is added. As most countries belong to the WTO nowadays, impact of pure membership on a country's FDI attractiveness is questionable per se (Rose, 2003). No significant impact is expected. In addition, a dummy variable which captures membership of country i in at least one bi- or plurilateral trade agreement as notified to the WTO (*WTO-PTIAs)* in year t is added to control for the role of trade agreements a host country i has ratified.

The vector of the *time dummies* $\mathbf{T}_t$ contains 14 elements corresponding to dummies for all years t but the first year. They are included to control for global shocks. Table 1 shows the descriptive statistics of all variables included in the estimations.

Table 1: Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum
Dependent Variable				
Log Employment (General)	0.81	2.19	0	12.323
Log Employment (Large Scale)	0.61	2.02	0	12.3
Explanatory Variables				
Log GDP	22.88	1.95	17.452	28.074
Similarity	0.07	0.10	0.00	0.70
Log Distance	9.170	0.49	7.05	9.830
Trade Openness	81.03	49.85	13.24	398.80
POLCON	0.36	0.311	0	0.89
ICRG Composite Index	60.48	12.14	8.50	89.13
BIT	0.0384	0.192	0	1
WTO-PTIAs	0.53	0.50	0	1
Log Japanese ODA	13.57	6.32	0	21.03
Log Japanese ODA (>0)	16.23	2.15	9.09	21.03
Log Japanese ODA p.c. (>0)	0.36	1.87	-7.21	6.21
Inflation	77.10	785.26	24.08	26762.02
Log of Tot. FDI Inflows Host Country	16.95	5.48	0	24.6
WTO-Member	0.68	0.47	0	1

Notes: The descriptive statistics are from the base regression (Table 2 colum 1). Descriptive statistics of all those variables not included in the base regressions are from the relevant regressions. Table 7 in the appendix provides more information on the variables and the datasouces.

5 Results & Discussion

Estimations are carried out for both general FDI including Japanese employment of small and large affiliates and for large FDI activities which only include the latter. In all specifications, the control variables have the expected signs which provides evidence for the reliability of the data and the empirical set-up. Cross-correlations of the independent variables (Table 8 in the appendix) show no sign for multicollinearity. Market size measured as *Log GDP* exercises a positive and significant impact. The

similarity coefficient carries the expected negative sign. The further away the investment destination, the less employees are reported. Trade openness shows a positive coefficient. The political risk variable has the expected positive sign. WTO membership is insignificant and the marginal effects of the bi- and plurilateral preferential trade and investment agreements (PTIAs) concluded by the host country are positive.

BITs are of relevance in particular for large-scale FDI. Using *general FDI* as the dependent variable (Table 2 column 1), thus including all affiliates also the smaller-sized ones, the positive impact of BITs is not robust. When limiting the sample to developing countries, thus to the low and middle income countries according to the World Bank classification, and when replacing the measure for the political environment, POLCON, with the ICRG index, BITs turn insignificant (column 3). Further sensitivity checks show that the BITs do not robustly influence general Japanese FDI activities: For instance, when including the total amount of FDI attracted to the host country by all investor nations and the inflation variable, Japanese BITs turn insignificant (column 4). Also, when using bootstrapped errors no significant relationship is established (not reported). However, when *limiting the affiliates included in the dependent variable calculation to those with an affiliate size of at least 100 Japanese employees*, the agreement is always of 1% significance (Table 2 columns 4-8), also when changing sample sizes and the included variables. Also in the case of bootstrapping BITs remain significant (not reported). This follows theory: The

larger the sunk costs of the investment and the importance of a subsidiary for a company, the higher the relevance of the reliability of the political environment. Hence, *hypothesis 1* on the relevance of BITs for FDI is only robustly supported for a reduced sample specification. There is some indication that its impact is conditional on the size of the investment.

Japanese ODA plays a positive, though minor role, for Japanese investment – a 1% increase in ODA spending will lead to an about 1% rise in FDI employment. When using the Japanese aid per capita measure (*Log JapODApc)* (Table 3 columns 1 and 3) and when applying the ODA flow measure without adding the zeros *(Log Jap. ODA w/o 0)* (Table 3 columns 2 and 4) the marginal effects of ODA are higher: For instance, in the general FDI case, a rise in ODA spending by 1% (of both the total ODA level and the per capital level without zeros) leads to a rise in Japanese employment by about 5% once companies have already entered the country (Table 3 columns 1 and 2). *Hypothesis 2* on the positive role of aid for FDI is confirmed. Therefore, the negative rent-seeking effects of aid as suggested by Svensson (2000) do not seem to dominate.

Table 2: Results (1) – Baseline Regressions

	General FDI								**Large FDI**							
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	All Cou.	ME(e, y, p)	Dev. Cou.	ME(e, y, p)	Dev. Cou.	ME (e, y,p)	All Cou.	ME(e, y, p)	All Cou.	ME(e, y,p)	Dev. Cou.	ME (e, y,p)	Dev. Cou.	ME (e, y,p)	All Cou.	ME(e, y, p)
Log GDP	3.211***	0.45 ;0.17	3.513***	0.46 ;0.15	3.401***	0.524 ;0.252	3.373***	0.47 ;0.17	4.935***	0.53 ;0.08	5.471***	0.56 ;0.07	5.456***	0.634 ;0.134	5.063***	0.53 ;0.08
	(0.124)	0.05	(0.165)	0.05	(0.152)	0.070	(0.134)	0.05	(0.224)	0.02	(0.187)	0.02	(0.305)	0.032	(0.261)	0.02
Similarity	-6.801***	-0.96 ;-0.37	-12.87***	-1.70 ;-0.54	-13.05***	-2.01 ;-0.97	-6.953***	-0.96 ;-0.35	-14.45***	-1.55 ;-0.25	-30.15***	-3.07 ;-0.39	-29.38***	-3.42 ;-0.72	-14.26***	-1.51 ;-0.22
	(0.936)	-0.12	(2.862)	-0.17	(2.737)	-0.27	(1.075)	-0.11	(1.467)	-0.06	(5.013)	-0.10	(6.210)	-0.17	(1.693)	-0.06
POLCON	0.586***	0.08 ;0.03	0.843***	0.11 ;0.04			0.695***	0.10 ;0.03	1.315***	0.14 ;0.02	1.870***	0.19 ;0.02			1.569***	0.17 ;0.02
	(0.142)	0.01	(0.175)	0.01			(0.162)	0.01	(0.256)	0.01	(0.318)	0.01			(0.296)	0.01
ICRG					0.0115**	0.002 ;0.001							0.027***	0.003 ;0.001		
					(0.00448)	0.000							(0.00772)	0.000		
LogDistance	-3.778***	-0.53 ;-0.20	-3.519***	-0.46 ;-0.15	-3.331***	-0.51 ;-0.25	-3.727***	-0.52 ;-0.19	-5.194***	-0.56 ;-0.09	-4.773***	-0.49 ;-0.06	-4.910***	-0.57 ;-0.12	-5.104***	-0.54 ;-0.08
	(0.302)	-0.06	(0.418)	-0.05	(0.412)	-0.07	(0.328)	-0.06	(0.505)	-0.02	(0.609)	-0.02	(0.654)	-0.03	(0.543)	-0.02
Trade Open	0.017***	0.002 ;0.001	0.0159***	0.002 ;0.001	0.0156***	0.00 ;0.00	0.0171***	0.002 ;0.001	0.0306***	0.003 ;0.001	0.0333***	0.003 ;0.000	0.0309***	0.004 ;0.001	0.0325***	0.003 ;0.001
	(0.00150)	0.000	(0.00194)	0.000	(0.00198)	0.00	(0.00164)	0.000	(0.00260)	0.000	(0.00344)	0.000	(0.00369)	0.000	(0.00286)	0.000
Jap. BITs	**0.794*** **	**0.12 ;0.05**	**0.420** **	**0.06 ;0.02**	**0.276**	**0.04 ;0.02**	**0.318***	**0.04 ;0.02**	**2.179*** **	**0.25 ;0.05**	**1.789*** **	**0.19 ;0.03**	**1.405*** **	**0.17 ;0.04**	**1.430*** **	**0.16 ;0.03**
	(0.142)	**0.01**	**(0.202)**	**0.01**	**(0.199)**	**0.01**	**(0.174)**	**0.01**	**(0.253)**	**0.01**	**(0.408)**	**0.01**	**(0.396)**	**0.01**	**(0.328)**	**0.01**
LogJapODA	**0.041*** **	**0.006 ;0.002**	**0.0571*** **	**0.008 ;0.002**	**0.0583*** **	**0.009 ;0.004**	**0.0455*** **	**0.006 ;0.002**	**0.0463*** **	**0.005 ;0.001**	**0.0535*** **	**0.005 ;0.00**	**0.0554*** **	**0.006 ;0.001**	**0.0524*** **	**0.006 ;0.001**
	(0.00494)	**0.001**	**(0.00678)**	**0.001**	**(0.00669)**	**0.001**	**(0.00549)**	**0.001**	**(0.00828)**	**0.000**	**(0.0119)**	**0.000**	**(0.0119)**	**0.000**	**(0.00931)**	**0.000**
WTO-PTIA	0.608***	0.09 ;0.03	0.709***	0.09 ;0.03	0.759***	0.117 ;0.056	0.694***	0.10 ;0.03	0.507***	0.05 ;0.01	0.582***	0.06 ;0.01	0.641***	0.074 ;0.016	0.568***	0.06 ;0.01
	(0.0781)	0.01	(0.0945)	0.009	(0.0954)	0.016	(0.0845)	0.01	(0.137)	0.002	(0.168)	0.002	(0.170)	0.004	(0.149)	0.00
WTO-Mem.	-0.0602	-0.01 ;0.00	-0.0744	-0.01 ;0.00	-0.0954	-0.015 ;-	-0.138	-0.02 ;-0.01	-0.179	-0.02 ;0.00	-0.290	-0.03 ;0.00	-0.282	-0.033 ;-	-0.304	-0.03 ;0.00
	(0.108)	0.00	(0.133)	-0.001	(0.131)	-0.002	(0.120)	-0.002	(0.183)	-0.001	(0.225)	-0.001	(0.228)	-0.002	(0.207)	-0.001
Total FDI							0.0216***	0.003 ;0.001							0.0342***	0.004 ;0.001
							(0.00611)	0.000							(0.00992)	0.000
Inflat.							0.000155**	0.00 ;0.00							0.000183**	0.00 ;0.00
							(4.21e-05)	0.000							(7.39e-05)	0.000
Constant	-50.22***		-60.28***		-59.41***		-55.09***		-86.73***		-103.6***		-102.6***		-91.36***	
	(4.205)		(5.734)		(5.541)		(4.584)		(6.893)		(7.908)		(10.42)		(7.565)	
Obs.	42067		39698		29946		39100		42067		39698		29946		39100	
Co.Ind.Pairs	3105		2944		2277		2944		3105		2944		2277		2944	
Uncensored.	6410		5040		4954		5804		3986		2999		2963		3561	
σ_λ,σ_u	6.173,1.828		6.594,2.030		6.493,2.013		6.3576,		9.105,2.449		9.610,2.716		9.491,2.714		9.129, 2.530	
LL,PseudoR	-16880, 0.35		-14154, 0.33		-13789, 0.33		-15633, 0.34		-11889, 0.33		-9492, 0.31		-9343, 0.30		-10830, 0.32	

Results are tobit estimates. The dependent variable Y_i is the natural logarithm of the affiliate employment* ownership of Japanese owners. All explanatory variables are lagged by one year. A group is defined as an industry in a country over time. Standard errors are given in parenthesis. The marginal effects *e, y* and *p* at the means of the explanatory variables are reported next to the coefficients. The estimates for year dummies are not reported, but are jointly significant. For the sample "All cou." all countries (Table 6) are included, while the sample "Dev. Cou." is limited to the low and middle income countries according to the Word Bank definition. Data is for 1990-2004. *,**,*** indicate significance at the 10%, 5%, and 1% level. LL refers to the Log-Likelihood, Pseudo R2 is the Mc Fadden R2. It compares the likelihood for the intercept only model M_c to the likelihood with the predictors M_F : $R^2 = 1 - \ln L(M_F) / \ln L(M_c)$

Table 3: Results (2) – Robustness Checks: Aid Measures

	General FDI				Large FDI			
	(1)	**ME (e, y, p)**	**(2)**	**ME (e, y, p)**	**(3)**	**ME(e, y, p)**	**(4)**	**ME (e, y, p)**
Log GDP	3.527***	*0.46 ;0.14*	3.294***	*0.43 ;0.13*	5.374***	*0.53 ;0.06*	5.148***	*0.51 ;0.06*
	(0.136)	*0.05*	(0.146)	*0.04*	(0.232)	*0.02*	(0.211)	*0.02*
Similarity	-7.090***	*-0.93 ;-0.29*	-5.051***	*-0.66 ;-0.20*	-13.37***	*-1.33 ;-0.15*	-10.87***	*-1.08 ;-0.12*
	(1.257)	*-0.10*	(1.302)	*-0.07*	(1.989)	*-0.04*	(2.025)	*-0.03*
POLCON	0.747***	*0.10 ;0.03*	0.750***	*0.10 ;0.03*	1.432***	*0.14 ;0.02*	1.442***	*0.14 ;0.02*
	(0.167)	*0.01*	(0.167)	*0.01*	(0.288)	*0.00*	(0.289)	*0.00*
Log Distance	-3.166***	*-0.41 ;-0.13*	-3.053***	*-0.40 ;-0.12*	-4.207***	*-0.42 ;-0.05*	-4.066***	*-0.40 ;-0.05*
	(0.289)	*-0.04*	(0.290)	*-0.04*	(0.458)	*-0.01*	(0.459)	*-0.01*
Trade Openness	0.0183***	*0.002 ;0.001*	0.0187***	*0.002 ;0.001*	0.0308***	*0.003 ;0.000*	0.0310***	*0.003 ;0.000*
	(0.00177)	*0.000*	(0.00178)	*0.000*	(0.00312)	*0.000*	(0.00307)	*0.000*
Jap. BITs	0.554***	*0.07 ;0.02*	0.531**	*0.07 ;0.02*	1.503***	*0.16 ;0.02*	1.492***	*0.15 ;0.02*
	(0.213)	*0.01*	(0.213)	*0.01*	(0.410)	*0.01*	(0.409)	*0.01*
WTO-PTIAs	0.496***	*0.065 ;0.020*	0.497***	*0.065 ;0.020*	0.283**	*0.028 ;0.003*	0.286**	*0.028 ;0.003*
	(0.0842)	*0.007*	(0.0844)	*0.007*	(0.145)	*0.001*	(0.145)	*0.001*
WTO-Member	-0.0649	*-0.008 ;-0.003*	-0.0502	*-0.007 ;-0.002*	-0.518**	*-0.05 ;-0.006*	-0.471**	*-0.047 ;-0.005*
	(0.122)	*-0.001*	(0.122)	*-0.001*	(0.204)	*-0.002*	(0.204)	*-0.002*
Log JapODApc	0.374***	*0.049 ;0.015*			0.558***	*0.055 ;0.006*		
	(0.0281)	*0.005*			(0.0526)	*0.002*		
Log Jap. ODA *w/o 0*			0.367***	*0.048 ;0.014*			0.530***	*0.053 ;0.006*
			(0.0284)	*0.005*			(0.0525)	*0.002*
Constant	-62.06***		-63.99***		-104.2***		-109.5***	
	(4.495)		(4.604)		(6.780)		(6.619)	
Observations	35167		35167		35167		35167	
Cou.-Ind. Pairs	2829		2829		2829		2829	
Uncensored	4882		4882		3075		3075	
σ_λ	5.961		6.048		8.741		8.959	
σ_u	1.784		1.786		2.359		2.362	
LL	-12838		-12842		-9114		-9120	
Pseudo R2	0.35		0.35		0.33		0.32	

Results are tobit estimates. The dependent variable Y_i is the natural logarithm of the share of employment

Since it is hypothesized that Japanese foreign aid disbursements and Japanese BITs act as substitutes with regard to their role as investment promotion devices *(hypothesis 3)*, the interaction term between the treaty and ODA is added to capture the effect of the treaties conditioned on development aid spending. The marginal effect of the BITs (1^{st} derivative) is expected to decrease with increasing ODA disbursements, here measured at its centiles. The substitutive relationship is statistically confirmed when the second derivative, measured as the normed difference between the BIT impact for high-aid receiving (80^{th} centile) and low-aid receiving countries (20^{th} centile), is negative and significant (Appendix 1).

The results of the estimations reveal a reduction in the impact of the BITs when moving from an environment with low to one with high ODA disbursements. Furthermore, this move is of statistical significance (Table 4).

Table 4: BITs and Japanese ODA: Marginal Effects

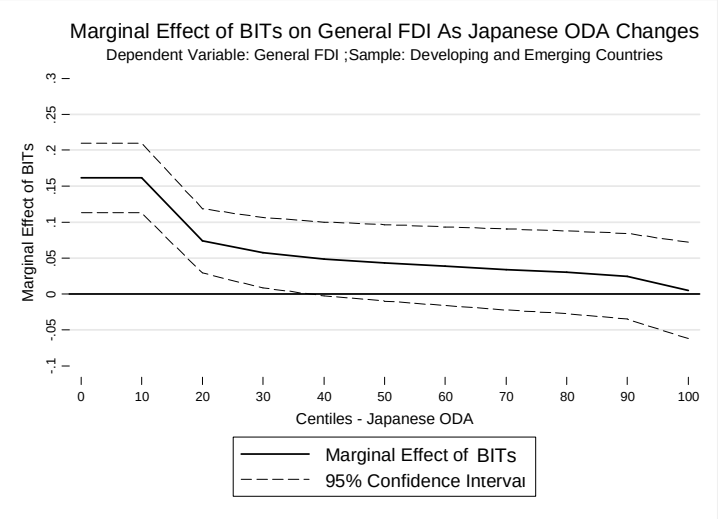
	Marginal Effects of the Interactions BIT - low ODA (20th centile) to high ODA (80th centile)	Marginal Effects of BITs BIT at the centiles and mean of ODA				
		20	40	60	80	mean
General FDI						
(1) - General FDI, all countries	-0.04 (0.00)	0.07 (0.00)	0.05 (0.06)	0.04 (0.17)	0.03 (0.30)	0.06 (0.01)
(2) - General FDI, developing countries	-0.04 (0.00)	0.04 (0.10)	0.02 (0.40)	0.01 (0.62)	0.01 (0.82)	0.03 (0.21)
(3) - General FDI, countries with positive ODA flows	-0.19 (0.00)	0.26 (0.00)	0.19 (0.00)	0.13 (0.00)	0.07 (0.02)	0.17 (0.00)
Large FDI						
(4) – Large FDI, all countries	-0.07 (0.00)	0.16 (0.00)	0.12 (0.00)	0.10 (0.01)	0.09 (0.04)	0.14 (0.00)
(5) – Large FDI, developing countries	-0.07 (0.00)	0.18 (0.00)	0.14 (0.00)	0.12 (0.01)	0.11 (0.03)	0.16 (0.00)
(6)– Large FDI, countries with positive ODA flows	-0.29 (0.00)	0.49 (0.00)	0.37 (0.00)	0.28 (0.00)	0.20 (0.00)	0.35 (0.00)

Notes: See table 2. Reported are the marginal effects of BITs on Japanese FDI activities and their respective p-values in parentheses. Marginal effects e , thus the impact of BITs on Japanese FDI activities in those cases when investment is above zero, are reported. They are reported at the mean and at the centiles of Japanese ODA (OECD, 2007). Results stem from panel tobit estimations. Table 9 reports coefficients

$$\log Y_{ij(t+1)} = \max(0, \alpha_0 + \beta_{BIT} BIT_{it} + \beta_{aid} Jap.Aid_{it} + \beta_{Int} \cdot BIT_{it} \cdot Jap.Aid_{it} + \beta_{GDP} GDP_{it} + \beta_{SIM} Similarity_{it} + \beta_{Trade} TradeOpenness_{it} + \beta_{POL} POLCON_{it} + \beta_{WTO} WTO_{it} + \beta_{PTIA} PTIA_{it} + \beta_T' T_{t+1} + \varepsilon_{ij(t+1)})$$

When using the *general FDI variable*, the measure of development aid flows *including the zero observations* (*Log Jap. ODA),* and when restricting the analysis to only *developing (low and middle income) countries*, BITs are not significant at any level of Japanese development aid disbursements (Table 4 row 2). The second derivative is, nevertheless, significant. However, when *additionally including the high income emerging economies* (encompassing, amongst others, Hong Kong and Korea) the first derivative, the BIT effect, turns significant until about the 40^{th} centile of Japanese ODA disbursements (8.77 mill. US$) (Table 4 row 1). Figure 2 illustrates this trend. In the graph the marginal effects of BITs are conditioned on the centiles of ODA spending for general FDI. The confidence intervals determine the conditions under which a BIT has a significant effect. This is the case whenever the upper and lower bounds are above or below the zero-line. BITs are significant when they are concluded with countries that have a higher than median level of political stability. The change in the results is due to the Hong Kong BIT of 1997. The BIT was concluded in the year Hong Kong was handed back to China. In the same year, the value of ODA dropped to zero, thus no more "development aid" was paid directly to Hong Kong. In 1996 it still obtained a net total of 5.9 million US Dollar.

Figure 2: Marginal Effect of BITs on General FDI Conditional on Japanese ODA Disbursement



Notes: Table 4 row 1 reports the marginal effects. Additional marginal effects to the ones in the table were calculated for the following centiles: 0,10,30,50,70,90,100.

In a next step *those countries without any Japanese ODA were excluded from the estimations (Log Jap. ODA w/o 0)* (Table 4 row 3). As a result, a significant relationship between BITs and ODA in the case of general FDI is revealed: A BIT impact on FDI of 26% in the case of low – at the 20th centile – ODA disbursements (2.25 mill. US$) decreases to 7% in the case of high – at the 80th centile – ODA disbursements (59.7 mill. US$). Statistical significance of BIT impact is attained at all levels of foreign aid spending. Also, the second derivative is statistically significant. Hence, when only considering the case when Japanese aid disbursements are positive

BITs and ODA seem to be alternative home government policies for FDI promotion.

Restricting the sample of affiliates included in the estimations to *those with at least 100 Japanese employee*s, the BIT effect is significant at almost all levels of ODA disbursements. As in the case of general FDI, the effect is decreasing with the amount of aid – both in the case of only developing economies and for the whole sample of developing and emerging economies. In the case of the 20^{th} (80^{th}) centile of ODA disbursements a 16-18% (9-11%) rise in Japanese employment is revealed (see table Table 4 row 4-6).

When omitting the zero-ODA countries *(Log Jap. ODA w/o 0)*, the results remain unchanged (Table 4 row 6). Also, the magnitude of the BIT effects decreases strongly with the amount of Japanese ODA disbursements.

Hence, this provides evidence for a replacement effect of the two policies for FDI promotion and supports *hypothesis 3*: Once high ODA flows are entering a country, a BIT is of less importance for the investments. This rejects the idea that a rise in economic growth through FDI, as proposed for instance in the two-gap model by Chenery and Strout (1966), led to the increase of FDI. If this had been the case, the interaction of the two policies would have been positive as BITs and ODA would have been complementary policies.

6 Conclusion

This study has analyzed the relationship between the impact of BITs and development aid on FDI in developing and emerging economies using evidence from Japanese companies.

Both BITs and foreign aid are found to exert a positive influence, but BITs only robustly when the affiliates included in the calculation of the industry-country-year FDI measure are restricted to those of larger size. The two home country policies "BITs" and "foreign aid" substitute for each other in their capacity to promote FDI. Hence, when foreign aid is high, the capacity of a BIT to act as an investment safeguard or as a mechanism to increase investment transparency is lower and vice versa. This could, amongst others, explain why the Japanese government in the past did not strongly "need" to negotiate BITs as it already exerted influence via aid. And indeed, as ODA spendings are decreasing, Japanese BIT and EPA negotiation have gained a new momentum.

These results, however, underlie several limitations. First, reverse causality between BITs and FDI may occur. It is rudimentarily taken account of in the study by using lagged explanatory variables. Moreover, due to the few BITs and the "peculiar" Japanese aid disbursement behavior the question arises in how far these results can be

generalized for other source or host countries. Further limitations are the rather strong assumptions involved when applying the random effects tobit model.

In spite of these limits, results have proven to be quite robust and follow theoretic predictions. Further research should address possible endogeneity, and conduct such analyses for other major investment source countries which have concluded a larger number of BITs in the past.

7 BIBLIOGRAPHY

Aisbett, Emma. 2007. Bilateral Investment Treaties and Foreign Direct Investment: Correlation versus Causation. *MPRA Paper No. 2255.*

Asiedu, Elizabeth. 2004. The Determinants of Employment of Affiliates of US Multinational Enterprises in Africa. *Development Policy Review*, 22(4): 371-79.

Asiedu, Elizabeth & Anne P. Villamil. 2002. Imperfect Enforcement, Foreign Investment, and Foreign Aid. *Macroeconomic Dynamics*, 6(4): 476-95.

Blaise, Severine. 2005. On the link between Japanese ODA and FDI in China: a microeconomic evaluation using conditional logit analysis. *Applied Economics*, 37(1).

Blonigen, Bruce. 2005. A Review of the Empirical Literature on FDI Determinants. *NBER Working Papers No. 11299.*

Blonigen, Bruce A. & Ronald B. Davies. 2004. The Effects of Bilateral Tax Treaties on U.S. FDI Activity. *International Tax and Finance*, 11: 601-22.

Brambor, Thomas, William R. Clark, & Matt Golder. 2006. Understanding Interaction Models: Improving Empirical Analyses. *Political Analysis*, 14: 63–82.

Braumöller, Bear. 2004. Hypothesis Testing and Multiplicative Interaction Terms. *International Organization*, 58: 807-20.

Brenton, Paul, Francesca Di Mauro, & Matthias Lücke. 1999. Economic Integration and FDI: An Empirical Analysis of Foreign Investment in the EU and in Central and Eastern Europe. *Empirica*, 26: 95-121.

Buch, Claudia M. & Alexander Lipponer. 2007. FDI versus exports: Evidence from German banks. *Journal of Banking & Finance*, 31(3): 805-26.

Buch, Claudia M., Jörn Kleinert, Alexander Lipponer, & Farid Toubal. 2005. Determinants and effects of foreign direct investment: evidence from German firm-level data. *Economic Policy*, 20(41): 51–110.

Busse, Matthias, Jens Königer, & Peter Nunnenkamp. 2008. FDI promotion through Bilateral Investment Treaties: More Than a Bit? *Kiel Working Papers, Feb 2008.*

Carr, David L., James R. Markusen, & Keith E. Maskus. 2001. Estimating the Knowledge-Capital Model of the Multinational Enterprise. *American Economic Review*, 91: 693-708.

Chakrabati, Avik. 2001. The Determinants of Foreign Direct Investment: Sensitivity Analyses of Cross-Country Regressions. *Kyklos*, 54(1): 89-114.

Charlton, Andrew. 2003. Incentive Bidding for Mobile Investment: Economic Consequences and Potential Responses. Paris: OECD Developement Center.

Chenery, Hollis B. & Alan M. Strout. 1966. Foreign Assistance and Economic Development. *American Economic Review*, 56(4): 679–733.

Davies, Ronald B., Pehr-Johan Norback, & Ayca Tekin-Koru. 2007. The Effect of Tax Treaties on Multinational Firms: New Evidence from Microdata. *MPRA Paper No. 6031.*

Davis, L.E. & Douglass C. North. 1971. *Institutional Change and American Economic Growth.* Cambridge: University Press.

Delios, Andrew & Witold J. Henisz. 2003. Political Hazards and the Sequence of Entry by Japanese Firms. *Journal of International Business Studies*, 34(3): 227-41.

Desai, Mihir A., Fritz C. Foley, & James R. Hines. 2006. Capital Controls, Liberalizations, and Foreign Direct Investment. *Review of Financial Studies*, 19(4): 1433-64.

Desbordes, Rodolphe & Vincent Vicard. 2007. Foreign Direct Investment and Bilateral Investment Treaties, an International Political Perspective. *Centre National de la Recherche Scientifique Working Papers 2007.45.*

Dunning, John. 1980. Toward an Eclectic Theory of International Production: Soem Empirical Tests. *Journal of International Business Studies*, 11(1): 9-31.

Egger, Peter & Valeria Merlo. 2007. BITs and FDI Dynamics. *World Economy*, 30(10): 1536-49.

Egger, Peter & Michael Pfaffermayr. 2004. Distance, trade, and FDI: A Hausman-Taylor SUR Approach. *Journal of Applied Econometrics*, 19: 227–46.

Egger, Peter & Michael Pfaffermayr. 2004. The impact of Bilateral Investment Treaties on Foreign Direct Investment. *Journal of Comparative Economics*, 32(4): 788-804.

Graham. 2000. *Fighting the Wrong Enemy.* Washington: Institute for International Economics.

Greene, William. 2004. Fixed Effects and Bias Due to the Incidental Parameters Problem in the Tobit Model. *Econometric Reviews*, 23(2): 125-47.

Gugler, Philippe & Vladimir Tomsik. 2007. General Agreement on Investment: Departure from the Investment Agreement Patchwork, *Four Decades of International Business at Reading.* Reading, UK.

Guzman, Andrew T. 2001. International Law: A Compliance Based Theory. *UC Berkeley Public Law Research Paper No. 47.*

Guzman, Andrew T. 1998. Why LDCs Sign Treaties that Hurt Them: Explaining the Popularity of Bilateral Investment Treatie, 38. *Virginia Journal of International Law*, 639: 639-88.

Hallward-Driemeier, Mary. 2003. Do Bilateral Investment Treaties Attract FDI? Only a bit and they could bite. *World Bank Policy Research Working Paper 3121.*

Harding, Torfinn & Beata Smarzynska Javorcik. 2007. Developing economies and international investors: do investment promotion agencies bring them together?

World Bank Policy Research Working Paper, WPS4339.

Harms, Philipp & Matthias Lutz. 2006. Aid, Governance and Private Foreign Investment: Some Puzzling Findings for the 1990s. *The Economic Journal*, 116(513): 773-90.

Hatch, Walter & Kozo Yamamura. 1996. *Asia in Japan's Embrace: Building a Regional Production Alliance.* Cambridge: Cambridge University Press.

Helpman, Elhanan, Marc J. Melitz, & Stephen R. Yeaple. 2004. Export versus FDI. *American Economic Review*, 94(1): 300-16.

Henisz, Witold J. 2002. The Institutional Environment for Infrastructure Investment. *Industrial and Corporate Change*, 11(2).

Henisz, Witold J. & Oliver Williamson. 1999. Comparative Economic Organization - Within and Between Countries. *Business and Politics*, 1(3): 261-77.

IMF. 1993. Balance of Payments Manual, 5. Edition. 5 ed.

Katzenstein, Peter J. 2005. *A World of Regions: Asia and Europe in the American Imperium.* Ithaca, New York: Cornell University Press.

Kimura, Hidemi & Yasuyuki Todo. 2007. Is Foreign Aid a Vanguard of FDI? A Gravity-Equation Approach. *RIETI Discussion Paper Series*, 07-E-007.

Kobrin, Stephen J & Brian Wu. 2005. Reason, Imitation or Coercion? The Liberalization of FDI Policy in Developing Countries, 1992-2001. *Working paper.*

Konno, Hidehiro & Eiji Tsukamoto. 2008. Overseas Investment Insurance and Investment Treaties.In Insurance, Nippon Export and Investment, editor, *Investment Risk and International Investment Agreements.* Research Institute ofEconomy, Trade & Industry.

Lipsey, Robert E. 2007. Defining and Measuring the Location of FDI Output. *NBER Working Paper 12996*.

Makino, Shige, Paul W. Beamish, & Natalie Bin Zhao. 2004. The characteristics and performance of Japanese FDI in less developed and developed countries. *Journal of World Business*, 39(4): 377.

Martin, Lisa L. & Beth A. Simmons. 1998. Theories and Empirical Studies of International Institutions. *International Organization*, 52 (4): 729-57.

Matsui, Yoshira. 1989. Japan's International Legal Policy for the Protection of Foreign Investment. *The Japanese Annual of International Law*, 32: 1-17.

McDonald, John F. & Robert A Moffitt. 1980. The Uses of Tobit Analysis. *Review of Economics & Statistics*, 62(2): 318-21.

METI, (Ministry of Economy, Trade and Industry). 2007. White Paper on International Economy and Trade 2007: Overview.

MOFA, (Ministry of Foreign Affairs Japan). 2008. Ministry of Foreign Affairs Japan.

Neumayer, Eric. 2006. Do double taxation treaties increase foreign direct investment to developing countries? *Journal of Development Studies*, 43(8): 1495-513.

Neumayer, Eric & Laura Spess. 2005. Do Bilateral Investment Treaties Increase Foreign Direct Investment to Developing Countries? *World Development*, 33(10): 1567-85.

Norton, Edrvard C., Hua Wang, & Chunrong Ai. 2004. Computing interaction effects and standard errors in logit and Probit models. *The Stata Journal*, 4(2): 154-67.

OECD. 2006. Development Aid at a Glance.

OECD. 2007. International Development Statistics (IDS) Online Databases.

OECD. 1996. OECD (Organisation for Economic Cooperation and Development) Benchmark Definition of Foreign Direct Investment, Third Edition.

OECD. 2004. Synergies between the Official Development Assistance and Private Investment: The 1993-2003 Experience in Vietnam.

Pempel, T.J. & Shujiro Urata. 2006. Japan: A new move toward bilateral trade arrangements.In Pempel, T.J., editor, *Bilateral Trade Agreements in the Asia-Pacific: Origins, Evolution, and Implications*. Londong: Routledge.

PRS, Political Risk Services. 1996. The ICRG Rating System: Political Risk Services.

Rajan, Raghuram G. & Arvind Subramanian. 2005. Aid and Growth: What Does the Cross-Country Evidence Really Show? *IMF Working Paper WP/05/127*.

Rose, Andrew. 2003. Notes on the Effects of WTO Membership on FDI and Services.

Sagara, Nozomi. 2003. A Historical Contemplation on International Investment Agreements: Perspectives on the Possibility of WTO Investment Consensus and Points of Interest for Developing Countries (国際投資協定の発展に関する歴史的考察：WTO 投資協定合意可能性と途上国関心事項の視点から). *RIETI Discussion Paper Series 04-J-023*.

Sakurai, Masao. 1996. Japanese law and policy for globalization of industry and the corporation: measures for relief from investment and trade frictions.In Young, Michael K. & Yuji Iwasawa, editors, *Trilateral perspectives on international legal issues: relevance of domestic law and policy*. New York: Transnational Publishers.

Solis, Mireya & Shujiro Urata. 2007. Japan's New Foreign Economic Policy: A Shift Toward a Strategic and Activist Model? *Asian Economic Policy Review*, 2: 227-45.

Sornarajah, M. 2004. The New World Economic Order and Equity.In Dixit, R., editor, *Dynamics of International Law in the New Millenium*. New Delhi: Indian Society of International Law.

Svensson, Jacob. 2000. Foreign Aid and Rent-Seeking. *Journal of International Economics*, 51: 437-61.

Sykes, Alan O'Neil. 2004. The Economics of Public International Law. *U Chicago Law & Economics, Olin Working Paper No. 216*.

Teece, David J. 1986. Transactions Cost Economics and the Multinational Enterprise. *Journal of Economic Behavior and Organization*, 7.

Tobin, Jennifer & Marc L. Busch. 2007. A BIT is Better Than a Lot: Bilateral Investment Treaties and Preferential Trade Agreements: Public Policy Institute, Georgetown University, Washington, DC.

Toyo Keizai. 1990-2005. Japanese overseas investment (per country), Kaigai shinshutsu kigyou souran (kuni-betsu).

ToyoKeizai. Annual volumes 1990-2005. Kaigai shinshutsu kigyou souran (kuni-betsu).

UNCTAD. 2001. *Home Country Measures*. New York and Geneva: United Nations.

UNCTAD. 2007. Recent developments in international investment agreements. *IIA MONITOR No. 3*.

UNCTAD. 2006. *World Investment Report 2006: FDI from Developing and Transition Economies: Implications for Development*. New York and Geneva: United Nations.

UNCTAD. 2007. *World Investment Report 2007: Transnational Corporations, Extractive Industries and Development*. New York and Geneva: United Nations.

Urata, Shujiro & Mireya Solis. 2007. Japan's New Foreign Economic Policy: A Shift Toward a Strategic and Activist Model? *Asian Economic Policy Review*, 2: 227-45.

Williamson, Oliver. 1991. Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly*, 36: 269-96.

Williamson, Oliver. 2000. The New Instiutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature*, 38: 595-613.

Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.

Yackee, Jason. 2006. Sacrificing Sovereignty: Bilateral Investment Treaties, International Arbitration, and the Quest for Capital. *USC Center in Law, Economics and Organization Research Paper No. C06-15*.

Yanase, Shuji. 2003. Bilateral Investment Treaties of Japan and Resolution of Disputes with Respect to Foreign Direct Investment.In Berg, Albert Jan van den, editor, *International Commercial Arbitration: Important Contemporary Questions, ICCA International Arbitration Congress*. The Hague, London, New York: Kluwer Law International.

Zhou, Changhui, Andrew Delios, & Jing Yu Yang. 2002. Locational Determinants of Japanese Foreign Direct Investment in China. *Asia Pacific Journal of Management*, 19(1): 63-86.

8 APPENDIX

Table 5: General FDI per Industry: Japanese Employment (Natural Logarithm)

	Mean	Median	Max	Min.	Std. Dev.	Obs.
Agriculture, forestry, and fisheries	4.69	4.86	8.32	1.16	1.74	272
Ceramic, stone and clay products	6.33	6.94	9.04	0.69	1.70	228
Chemical, Petroleum, Coal, Rubber, etc.	6.19	6.49	10.46	0.69	2.46	369
Construction	4.60	4.73	8.26	0.69	2.18	396
Electrical machinery, Equipment and Supply	7.09	7.21	12.32	0.84	2.85	430
Fabricated metal products	6.76	7.05	9.55	1.39	1.52	185
Finance and insurance	4.76	4.77	8.69	0.69	2.17	294
Food, beverages, tabacco and prepared an	6.34	6.56	9.94	2.59	1.84	260
General Machinery	6.38	7.07	10.58	0.69	2.24	284
Iron and Steel	5.20	5.36	8.49	1.22	1.61	294
Lumber and wood products and Pulp, paper	5.63	5.40	9.19	2.11	1.83	202
Mining	5.02	5.58	7.62	1.61	1.34	138
Miscellaneous industries	4.92	4.98	9.33	0.69	2.26	451
Miscellaneous manufacturing industries	5.55	6.10	8.98	1.10	2.20	325
Non-ferrous metals and products	6.48	6.83	9.31	2.60	1.75	240
Precision instruments and machinery	7.23	7.48	10.17	2.77	1.55	192
Printing and Allied Industry	5.41	5.76	7.78	0.69	1.64	117
Real estate	3.95	3.80	7.00	0.69	1.59	165
Stock holding and Controlling Companies	5.09	5.27	8.69	0.69	2.35	109
Textile mill products and Apparel	6.71	6.94	11.04	2.13	1.96	318
Transport, electricity, gas, heat supply	5.08	5.00	8.85	0.97	2.13	346
Transportation Equipment	6.62	7.17	10.71	0.69	2.52	429
Wholesale and retail trade	5.20	5.25	9.94	0.69	2.21	675
All	5.72	5.77	12.32	0.69	2.28	6719

Source: Toyo Keizai (1990-2005). Statistics for positive observations for developing and emerging economies. Japanese employment (at least 10% ownership) for the selected country sample (1990-2004) per industry.

Table 6: Sample Countries

Albania Algeria Angola Argentina Armenia Azerbaijan Bangladesh Belarus Benin Bhutan Bolivia Bosnia and Herzegovina Botswana Brazil Bulgaria Burkina Faso Burundi Cambodia Cameroon Cape Verde Central African Republic Chad Chile China Colombia Comoros Congo, Dem. Rep. Congo, Rep. Costa Rica Cote d'Ivoire Croatia Czech Republic Djibouti Dominica Dominican Republic Ecuador Egypt, Arab Rep. El Salvador Equatorial Guinea Eritrea Estonia Ethiopia Fiji Gabon Gambia, The Georgia Ghana Grenada Guatemala Guinea Guinea-Bissau Guyana Haiti Honduras Hong Kong, China Hungary India Indonesia Iran, Islamic Rep. Israel Jamaica Jordan Kazakhstan Kenya Korea, Rep. Kyrgyz Republic Lao PDR Latvia Lebanon Lesotho Liberia Libya Lithuania Macao Macedonia, FYR Madagascar Malawi Malaysia Maldives Mali Mauritania Mauritius Mexico Moldova Mongolia Morocco Mozambique Namibia Nepal Nicaragua Niger Nigeria Oman Pakistan Palau Panama Papua New Guinea Paraguay Peru Philippines Poland Romania Russian Federation Rwanda Sao Tome and Principe Saudi Arabia Senegal Serbia and Montenegro Seychelles Sierra Leone Singapore Slovak Republic Slovenia South Africa Sri Lanka Sudan Swaziland Syrian Arab Republic Taiwan Tajikistan Tanzania Thailand Togo Trinidad and Tobago Tunisia Turkey Turkmenistan Uganda Ukraine Uruguay Uzbekistan Venezuela, RB Vietnam Yemen, Rep. Zambia Zimbabwe

Note: Countries entering the base regressions (Table 2 column 1).

Table 7: Overview: Variables and Datasources

Variable	Definition	Source
Log Employment	Natural logarithm of the total employment* investment share of Japanese owners within the company if the Japanese investment share amounts to at least 10%.	Toyo Keizai
Jap. BIT	A dummy which is 1 if the destination country i ratified a bilateral investment treaty with Japan in year t and all following years.	UNCTAD
Log Japanese ODA	Natural logarithm of positive values of total Official Development Assistance provided by Japan (in constant US Dollar year 2000). Negative values are replaced by 0. 0 values are inserted for those countries where no values for Japan are reported while other donours have provided aid.	OECD Development Statistics
Log Jap. ODA w/o 0	As above, but without additional zeros.	OECD Development Statistics
Log Jap. Grant	As above, but without additional zeros. Instead of the Net ODA figure, only grants are included in the calculation.	OECD Development Statistics
Log Ratio Jap. Grant	Ration of grants disbursed by Japan over the grants disposed by all donors.	OECD Development Statistics
Log GDP	The natural logarithm of the Gross Domestic Product (in constant US Dollar year 2000).	WDI 2007
Log Distance	Natural logarithm of the circle distance between the capital of the destination country and Tokyo.	CEPII distance measures
Similarity	Host country's GDP per capita divided by Japanese GDP per capita measured (in constant US Dollar year 2000).	WDI 2007
Trade openness	(Exports plus imports)/ GDP (in constant US Dollar year 2000).	WDI 2007
Log of Total FDI Inflows Host Country	The amount of total FDI inflows into a host country by all investor nations as recorded in the host country's Balance of Payments (natural logarithmic transformation, in constant US Dollar year 2000).	WDI 2007
Inflation	GDP deflator.	WDI 2007
POLCON	The political constraints index (POLCON) measures the political institutional stability of an economy. It ranges from 0-1 – the higher the value, the less feasible is policy change.	Henisz (2002)
ICRG	The International Country Risk Guide (ICRG) composite index measures political risk as perceived by country experts and ranges from 0-100 while 0 refers to high risk and 100 to low risk	PRS (1996).
WTO-PTIAs	A dummy variable which captures membership (year of entry-into force) for country i in year t in at least one trade agreement as notified to the WTO and all the following years.	WTO (2006)
WTO Member	A dummy variable that reflects membership in the GATT/ WTO: it turns 1 in the year a country has joined the GATT or WTO and all the following years.	WTO

WDI= World Development Indicators; CEPII= Centre d'Etudes Prospectives Internationales; PRS = Political Risk Services Group.

Table 8: Correlation Matrix: Base Model Specification

	Log GDP	Similarity	POLCON	Log Distance	Trade Openness	Japanese BITs	WTO-PTIAs	WTO-Member	Log Jap. ODA
Log GDP	1.000								
Similarity	0.425	1.000							
POLCON	0.344	0.260	1.000						
Log Distance	-0.328	-0.265	-0.026	1.000					
Trade Openness	-0.122	0.476	0.102	-0.206	1.000				
Japanese BITs	0.265	0.065	0.003	-0.265	-0.019	1.000			
WTO-PTIAs	0.092	0.033	0.268	0.160	0.123	-0.092	1.000		
WTO-Member	0.117	0.072	0.314	0.272	-0.025	0.051	0.163	1.000	
Log Jap. ODA	-0.148	-0.329	-0.179	0.108	-0.238	0.036	-0.085	0.122	1.000

Table 2 column 1 reports coefficients and marginal effects.

Table 9: BITs and Japanese ODA: Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)
	General FDI, All Countries	General FDI, Developing Countries	Large FDI, All Countries	Large FDI, Developing Countries	General FDI, All Countries with pos. Japanese ODA	Large FDI, All Countries with pos. Japanese ODA
Log Japanese ODA	0.0452***	0.0629***	0.0569***	0.0611***	0.414***	0.609***
	(0.00509)	(0.00692)	(0.00852)	(0.0121)	(0.0301)	(0.0553)
Japanese BITs, in force	1.154***	1.008***	2.663***	3.425***	8.418***	17.20***
	(0.169)	(0.275)	(0.287)	(0.591)	(1.606)	(3.136)
Log Jap. ODA*Jap. BITs	-0.0533***	-0.0537***	-0.105***	-0.135***	-0.441***	-0.861***
	(0.0134)	(0.0172)	(0.0244)	(0.0354)	(0.0890)	(0.171)
Log GDP	3.242***	3.483***	4.299***	5.700***	3.287***	5.106***
	(0.127)	(0.148)	(0.228)	(0.226)	(0.142)	(0.256)
POLCON	0.668***	0.850***	1.424***	1.898***	0.659***	1.269***
	(0.144)	(0.174)	(0.253)	(0.320)	(0.168)	(0.289)
Similarity	-7.107***	-12.60***	-13.75***	-31.93***	-4.913***	-10.82***
	(0.946)	(2.703)	(1.521)	(5.180)	(1.305)	(1.994)
Log Distance	-3.866***	-3.558***	-5.067***	-4.982***	-3.078***	-3.901***
	(0.306)	(0.396)	(0.388)	(0.634)	(0.290)	(0.442)
WTO-PTIAs	0.613***	0.710***	0.517***	0.582***	0.451***	0.219
	(0.0781)	(0.0940)	(0.135)	(0.169)	(0.0848)	(0.145)
Trade Openness	0.0166***	0.0159***	0.0313***	0.0332***	0.0189***	0.0322***
	(0.00150)	(0.00192)	(0.00271)	(0.00355)	(0.00178)	(0.00312)
WTO-Member	-0.0470	-0.0409	-0.149	-0.285	-0.0625	-0.530***
	(0.109)	(0.131)	(0.182)	(0.226)	(0.122)	(0.203)
Constant	-50.29***	-59.24***	-71.59***	-107.6***	-64.33***	-110.8***
	(4.284)	(5.218)	(6.622)	(8.502)	(4.523)	(7.103)
Observations	42067	39698	42067	39698	35167	35167
Cou.-Ind. Pairs	3105	2944	3105	2944	2829	2829
Uncensored	6410	5040	3986	2999	4882	3075
σ_{λ}	6.217	6.533	8.171	9.912	6.031	8.675
σ_{u}	1.827	2.026	2.438	2.714	1.783	2.355
Log-Likelih.	-16874	-14147	-11880	-9484	-12830	-9106
Mc Fadden Pseudo R2	0.35	0.33	0.33	0.31	0.35	0.33

Results are tobit estimates. The dependent variable Y_{ijt} is the natural logarithm of the share of employment attributed to the Japanese owners (total employment* investment share of Japanese owners within the company). All explanatory variables are lagged by one year. A group is defined as an industry in a country over time. Standard errors are given in parenthesis. The estimates for year dummies are not reported, they are however jointly significant in all of the models. Data is for 1990-2004. *,**,*** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 10: International Trade and Investment Agreements Japan (as of Aug 2008)

	Signature	**In Force**
Bilateral investment treaties BITs		
Bangladesh	1998	1999
China	1988	1989
Egypt	1977	1978
Hong Kong	1997	1997
Korea	2002	2003
Mongolia	2001	2002
Pakistan	1998	2002
Russia	1998	2000
Sri Lanka	1982	1982
Turkey	1992	1993
Vietnam	2003	2004
Cambodia	2007 (April)	2008 (July)
Laos	2008 (Jan)	2008 (July)
Uzbekistan	2008 (Aug)	
Saudi-Arabia	Under negotiation	
Qatar	About to start negotiations	
Trilateral investment treaties		
China, Korea, Japan	Negotiation	
Economic Partnership Agreements (Preferential trade and investment agreements PTIA)		
Singapore	2002	2002
Mexico	2004	2005
Malaysia	2005	2006
Philippines	2006	
Chile	2007 (March)	2007 (Sept)
Thailand	2007 (April)	2007 (Nov)
Brunei	2007 (June)	2008 (July)
Indonesia	2007 (August)	2008 (July)
Korea	Negotiations halted 2004	
ASEAN	Agreement finalized 04/2008	
Gulf Cooperation Council	Negotiations	
Vietnam	Negotiations	
India	Negotiations	
Switzerland	Negotiations	
Australia	Negotiations	
ASEAN+3 (Japan, China, Korea), ASEAN 10+5 (+ Hong Kong, Taiwan)	Discussion	
Comprehensive Economic Partnership in East Asia.(ASEAN, China, South Korea, Japan, India, Australia, and New Zealand.	Discussion	

Source: MOFA (2008)

Appendix 1: Marginal Effect Calculation for Interactions in Tobit

The following derives the marginal effects and standard errors in the non-linear tobit model with interaction terms. The logic of Norton et al. (2004) for the logit model is applied using the formulas provided in Wooldridge (2002) and McDonald & Moffitt (1980) to derive the respective expressions for the marginal effects. Only the marginal effect e, $\frac{\partial E(y|X, y>0)}{\partial x^k}$, is derived for the case of the interaction between one continuous variable (AID) and one dichotomous 0-1 dummy variable (BIT). The interaction term between the two is abbreviated with INT.

z in the example looks like

$$(8)\ z = \frac{\tilde{\beta}' \bar{\tilde{X}} + \beta_{INT} \cdot \overline{AID} \cdot \overline{BIT} + \beta_{BIT} \cdot \overline{BIT} + \beta_{AID} \cdot \overline{AID}}{\sigma},$$

where $\tilde{X}$ refers to the K-3 long vector of the independent variables except of the interacted variables, $\tilde{\beta}$ denotes the corresponding coefficients, and the dash refers to the mean value of the explanatory variables $\tilde{X}$, AID, and BIT across all countries, industries, and years.

The first derivatives for the interacted variables are the following:

- For the continuous interacted variable AID the marginal effect is not simply the adjusted coefficient β_{AID}, but may be substantially higher or lower in proportion

to the coefficient of the interaction term.

$$(9)\quad \frac{\partial E(y|X, y>0)}{\partial AID} = (\beta_{AID} + \beta_{INT} * \overline{BIT}) * \left(1 - z * \phi(z)/\Phi(z) - \phi(z)^2/\Phi(z)^2\right)$$

- For the dichotomous variable *BIT* the marginal effect is calculated as:

$$(10)\quad \frac{\Delta E(y|X, y>0)}{\Delta BIT} = E(y|X, BIT=1, y>0) - E(y|X, BIT=0, y>0).$$

As the expected value of positive FDI is defined as

$$(11)\quad E(y|X, y>0) = \beta' X + \sigma \cdot \frac{\phi(z)}{\Phi(z)},$$

the expected value of positive FDI when a BIT is concluded (value 1) and when a BIT has not been concluded (value zero) is defined. The other explanatory variables are kept at their mean values. For presentation purposes consider z_{pos} and z_{ZER}

$$(12)\quad z_{pos} = \frac{\tilde{\beta}' \bar{\tilde{X}} + \beta_{INT} \cdot \overline{AID} \cdot 1 + \beta_{BIT} \cdot 1 + \beta_{AID} \cdot \overline{AID}}{\sigma}$$

$$(13)\quad z_{zer} = \frac{\tilde{\beta}' \bar{\tilde{X}} + \beta_{INT} \cdot \overline{AID} \cdot 0 + \beta_{BIT} \cdot 0 + \beta_{AID} \cdot \overline{AID}}{\sigma} = \frac{\tilde{\beta}' \bar{\tilde{X}} + \beta_{AID} \cdot \overline{AID}}{\sigma}.$$

Then,

$$(14)\quad \frac{\partial E(y|X, y>0)}{\partial BIT} = \sigma \cdot \left\{ z_{pos} + \frac{\phi(z_{pos})}{\Phi(z_{pos})} \right\} - \sigma \cdot \left\{ z_{zer} + \frac{\phi(z_{zer})}{\Phi(z_{zer})} \right\}$$

Opening the brackets and simplifying yields:

$$(15) \qquad \frac{\partial E(y|X, y>0)}{\partial BIT} = \beta_{BIT} + \beta_{INT} \cdot \overline{AID} + \sigma \cdot \left\{ \frac{\phi(z_{pos})}{\Phi(z_{pos})} - \frac{\phi(z_{zer})}{\Phi(z_{zer})} \right\}.$$

The eventual magnitude of the adjusted marginal effects strongly depends on the interaction term.

The second derivative focusing on BITs measures the change in impact of the BITs on FDI activities due to a change in aid spending.

$$(16) \qquad \frac{\partial^2 E(y|X, y>0)}{\partial BIT \cdot \partial AID} = \frac{\partial \frac{\Delta E(y|X, y>0)}{\Delta BIT}}{\partial AID}.$$

The derivative is approximated through a difference term:

$$(17) \qquad \begin{aligned} \frac{\partial \frac{\Delta E(y|X, y>0)}{\Delta BIT}}{\partial AID} &\approx \frac{\Delta^2 E(y|X, y>0)}{\Delta BIT \cdot \Delta AID} \\ &= \frac{\Delta \left\{ \sigma \cdot \left\{ z_{pos} + \frac{\phi(z_{pos})}{\Phi(z_{pos})} \right\} - \sigma \cdot \left\{ z_{zer} + \frac{\phi(z_{zer})}{\Phi(z_{zer})} \right\} \right\}}{\Delta AID}. \end{aligned}$$

Thus, the analysis is restricted to the influence of a move from low to high development aid disbursements on BIT effectiveness. Four terms – z_{pos_high} , z_{zero_high}, z_{pos_low}, z_{zero_low} – are defined in this context. They differ if a BIT is concluded or if it is not, and if development aid spending is defined as high (AID^{high}) or low (AID^{low}). High values are calculated as the 80th centile value of development spending, thus, the value at or below which 80% of all countries are found with respect to the Japanese

development aid they receive. Low values use the 20% centile. Maximum and minimum values were not used to calculate the second derivatives in order to not distort the results due to outliers. Thus,

$$z_{pos\_high} = \frac{\tilde{\beta}'\bar{\bar{X}} + \beta_{INT} \cdot AID^{high} + \beta_{BIT} + \beta_{AID} \cdot AID^{high}}{\sigma}; \tag{18}$$

$$z_{zer\_high} = \frac{\tilde{\beta}'\bar{\bar{X}} + \beta_{AID} \cdot AID^{high}}{\sigma}; \tag{19}$$

$$z_{pos\_low} = \frac{\tilde{\beta}'\bar{\bar{X}} + \beta_{INT} \cdot AID^{low} + \beta_{BIT} + \beta_{AID} \cdot AID^{low}}{\sigma}; \tag{20}$$

$$z_{zer\_low} = \frac{\tilde{\beta}'\bar{\bar{X}} + \beta_{AID} \cdot AID^{low}}{\sigma}. \tag{21}$$

Taking differences with respect to development aid spending leads to

$$\frac{\Delta^2 E(y|X, y>0)}{\Delta BIT \cdot \Delta AID} = \frac{\sigma \cdot \left\{ z_{pos\_high} + \frac{\phi\left(z_{pos\_high}\right)}{\Phi\left(z_{pos\_high}\right)} \right\} - \sigma \cdot \left\{ z_{zer\_high} + \frac{\phi\left(z_{zer\_high}\right)}{\Phi\left(z_{zer\_high}\right)} \right\}}{\Delta AID} - \frac{\left\{ \sigma \cdot \left\{ z_{pos\_low} + \frac{\phi\left(z_{pos\_low}\right)}{\Phi\left(z_{pos\_low}\right)} \right\} - \sigma \cdot \left\{ z_{zer\_low} + \frac{\phi\left(z_{zer\_low}\right)}{\Phi\left(z_{zer\_low}\right)} \right\} \right\}}{\Delta AID}. \tag{22}$$

Simplifying yields:

$$\frac{\Delta^2 E(y|X, y>0)}{\Delta BIT \cdot \Delta AID} = \beta_{INT} + \frac{\sigma \cdot \left\{ \frac{\phi\left(z_{pos\_high}\right)}{\Phi\left(z_{pos\_high}\right)} - \frac{\phi\left(z_{zer\_high}\right)}{\Phi\left(z_{zer\_high}\right)} - \frac{\phi\left(z_{pos\_low}\right)}{\Phi\left(z_{pos\_low}\right)} + \frac{\phi\left(z_{zer\_low}\right)}{\Phi\left(z_{zer\_low}\right)} \right\}}{\Delta AID} \tag{23}$$

.