

International Investment Agreements and FDI Heterogeneity: Industry Evidence from Japanese Multinational Companies

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Abstract:

The paper analyses the impact of international trade and investment agreements on foreign direct investment (FDI) in developing and emerging economies. Although these agreements have proliferated during the past two decades, empirical evidence on the fact if they eventually exert impact on overseas investment activities is mixed. The paper aims at contributing to this literature by capturing FDI heterogeneity. Existing studies have up to now only used pooled country-level FDI data. However, based on transaction cost and institutional theory, agreement effects are expected to differ according to FDI characteristics. In this context, agreements should be of relevance in particular for large and/or highly asset specific investments.

Since comparable disaggregated cross-country FDI data is not available, I focus on one investor nation – Japan. FDI activities are measured by aggregating the foreign affiliate employment of Japanese multinational companies by host country and by the sector of the Japanese parent firm. For the period 1990-2004 different specifications of a Tobit model with random effects are estimated.

The results show that only large-scale FDI is robustly influenced by the investment protecting bilateral investment treaties. Preferential trade and investment agreements exert positive impact for overall FDI, and, in particular, for industries known to carry out vertical FDI. Poolability of the data across industries is rejected: Industry differences matter strongly. Asset specificity measured as the industry average of the R&D intensity of the parent firms is, however, not significant for the agreement effect.

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1. INTRODUCTION

The importance of developing economies as destination for foreign direct investment (FDI) has strongly increased during the last couple of years. From an average of about 20% of worldwide FDI during 1999-2001 it increased to an average of 35% between 2002-2005 (UNCTAD 2006a). Nevertheless, investment into these countries still often faces not only regulatory and legal investment barriers, but also an insecure business environment due to a high level of political instability deterring long-term and high profile corporate involvement. Even though investor home and investment host governments design policies with the purpose of investment barrier and risk reduction, empirical evidence on the fact if these policies eventually exert impact on overseas investment activities is mixed.

One area of such policies is the conclusion of bilateral or plurilateral investment agreements. Their number has been steadily increasing. Whereas bilateral investment treaties (BITs) mainly deal with investment treatment, protection, compensation for expropriation as well as arbitration in the case of investor-state disputes, FDI relevant provisions within preferential investment agreements provide for increased market access and deal with broader issues influencing the investment entry, treatment and protection. These preferential investment agreements (PTIAs) are most often designed as trade agreements which additionally include provisions on investment. Theoretically, international investment treaties are expected to positively influence foreign investment activities as they help governments to commit themselves credibly to protect and fairly treat existing investment. They also help to liberalize investment related laws and regulation when governments are unable to do this on a domestic scale. Empirically, however, the eventual role of the agreements for investment, in particular with regard to the conditions required for investment attraction, has not been clearly identified.

My study aims at contributing to this empirical literature by analysing the type of businesses that are affected by the agreements. Until now, only cross-country analyses have been carried out where FDI had been pooled across firms and industries. However, based on transaction cost and institutional theory, agreement effects are expected to differ according to the FDI carried out, mainly according to the specificity and the size of the transferred assets. It is

hypothesized that the more asset specific and the larger the FDI, the lower the amount transferred to highly volatile environments, and thus the larger the positive impact of the agreements due to their investment safeguarding role. Furthermore, it is expected that, as a result of tariff liberalization, the preferential trade and investment agreements will particularly increase vertical FDI while an increase in horizontal FDI is only expected for asset-specific FDI.

Since cross-country disaggregated FDI data is not available, I focus on one investor nation – Japan. Japan is one of the top-five investor nations worldwide and has an unusual high share of investment within developing and emerging economies (UNCTAD 2006a). The Japanese government is known to strongly support its companies abroad through targeted foreign aid, strong export financing activities, the provision of information on foreign markets, and its close cooperation with the Japanese trading companies (Hatch and Yamamura 1996; Katzenstein 2005: 60). The role of investment agreements for Japanese business activities has only lately received attention as a result of the high activism the Japanese government has shown in concluding bilateral trade and/ or investment agreements. However, Japan has up to date ratified only eleven BITs. PTIAs (in Japan referred to as Economic Partnership Agreements) have only been signed since 2002. As such, PTIAs are relevant for Japan primarily as an outsider nation. Despite the small number of agreements in which Japan is directly involved, surveys and case study research reveal that Japanese companies are interested in both types of agreements and claim to be influenced also by third-country agreements (JBIC 2004, 2005; JETRO 2003, 2004, 2005, 2006; Keidanren 2002). Also, empirical studies provide evidence that Japanese FDI has been influenced by trade restraints in the past in the case of investment into industrialized countries, e.g. anti-dumping activities by the EU and US government in the case of investment into industrialized countries – though empirical evidence is mixed (e.g. Barrell and Pain 1999; Clegg and Scott-Green 1999).

FDI activities are measured by aggregating the foreign affiliate employment of Japanese multinational companies by the sector of the Japanese parent firm and by the host country. Two FDI measures, general and large-scale FDI, are used according to the size of the affiliates included in the aggregation. For the period 1990-2004 different specifications of a Tobit model with industry-country random effects are estimated. As robustness checks, the regressions are run with Least Squares. To test for the relevance of industry and investment heterogeneity I test standard regressions for both general FDI and large-scale FDI, I interact a

measure for asset specificity (R&D specificity) with the agreements, and I run the regressions for the individual industries and test for the poolability of the results.

The results show that only large-scale FDI is robustly and significantly influenced by the investment protecting bilateral investment treaties. The impact of preferential trade and investment agreements is positive. The latter seems to be of larger relevance for vertical than horizontal FDI. Asset specificity measured as the R&D intensity of parent firm industry averages is, however, not relevant. Poolability of the data across industries is rejected: Industry differences matter strongly.

The paper is structured as follows: First, the analytical and empirical background is provided and hypotheses are derived. Non standard data is presented and the methodology discussed. After presenting the econometric model, I discuss the findings. In the conclusion I will summarize the major outcomes and indicate next research steps.

2. ANALYTICAL AND EMPIRICAL BACKGROUND

2.1. The International Investment Regime

Multilateral approaches to regulate and protect foreign direct investment (FDI) have not succeeded over the last decades. International customary law dealing with the treatment of foreign direct investments in the case of expropriation did not survive the 1970s (Guzman 1998). Also, attempts that were undertaken at the level of the Organization of Economic Development and Cooperation (OECD) and the World Trade Organization (WTO) failed (Gugler and Tomsik 2007; Sornarajah 2004). Instead, a complex web of preferential trade and investment agreements (PTIAs) and bilateral investment treaties (BITs) has emerged governing foreign direct investment sometimes even leading to overlapping investment regimes.

- **Preferential Trade and Investment Agreement and regional agreements**

Preferential trade and investment agreements (PTIAs) have been rapidly proliferating since the 1990s. The World Trade Organization cites as many 201 agreements (including enlargements of existing treaties) that were notified to it by September 2007 (WTO 2007). These PTIAs can include both bilateral and plurilateral agreements as well as those confined to regional agglomerations of countries or inter-regional ones. Confusion may arise as the

WTO calls all of these agreements “regional trade agreements” (WTO 2007) although they are very often not regional in design. Coverage of these agreements has increased in scope over the years. Formerly, trade tariff liberalization and other measures governing trade played an important role in the design. However, as tariff lines have already been highly liberalized, new issues, as for instance investment, are increasingly covered (Crawford and Fiorentino 2005). FDI relevant provisions within the PTIAs provide for increased market access and deal with broader issues influencing investment entry, treatment and protection (UNCTAD 2006b).

The term *regional trade and investment agreements (RTIAs)* as opposed to the notion of PTIAs refers only to those trade and investment pacts that have been concluded in a regional context. Prominent examples with regard to developing and emerging economies are the Southern Common Market (MERCOSUR), the Caribbean Community (CARICOM), the Andean Community, the Association of Southeast Asian Nations (ASEAN), and, due to the membership of Mexico, the North American Free Trade Agreement (NAFTA).

Japan has only recently (2002) started signing comprehensive trade agreements which also include investment clauses. As multilateral trade negotiations within the WTO came to a standstill at the end of the 1990s (Cho 2007), and all other major industrial nations were strongly promoting a large network of bilateral and plurilateral trade and investment agreements, Japan started to adopt a pluri- and bilateral trade and investment policy with a strong focus on East Asia (Pempel and Urata 2006). As a result, since 2002 five economic partnership agreements (EPAs) (Singapore, Mexico, Malaysia, Thailand and Chile) have been ratified and three more have been signed. Moreover, Japan is eager to complete new deals at the moment: About 7 EPA are in the process of negotiation and discussion (see the appendix table T 5 for details). Due to their recent nature, however, the agreements have not been included in the analysis. Thus, the preferential trade and investment agreements have, in the past, for Japanese firms only been important as a third country. Due to the strong presence of Japanese firms abroad in particular in the Asian region (see section 3.1), regional “insider” effects should, however, also occur.

- **Bilateral Investment Treaties**

Since the first bilateral investment treaty was signed between Germany and Pakistan in 1959, *Bilateral Investment Treaties (BITs)* have proliferated during the past decades and by 2006 amounted to 2,573 (UNCTAD 2007b). During the first three decades only few BITs emerged

(by the end of the 1980s only 385), in the 1990s, however, BITs were rapidly growing though growth has again decreased since 2002 (UNCTAD 2007b).

With respect to the number of agreements individual nations have concluded, Germany ranks first having signed 134 BITs until the end of 2006, followed by China with 120 and Switzerland with 114 treaties. The United States only started its BIT-initiative in the 1980s and has signed relatively few treaties. Japan is the industrialized countries that has signed the lowest number of BITs (UNCTAD 2007b). It only started concluding BITs in 1977 and the majority of its 11 BITs (with Bangladesh, China, Egypt, Hong Kong, Korea, Mongolia, Pakistan, Russia, Sri Lanka, Turkey, and Vietnam) have been concluded in the 1990s and the beginning of the first decade of the 21st century. In June 2007, Japan signed one more with Cambodia and is currently in negotiations with Laos, Saudi-Arabia and on a trilateral basis with China and Korea.

Although BITs are negotiated on a bilateral basis leading to a variety of outcomes, they are increasingly converging as FDI exporting nations possess model treaties along which they negotiate, which, over time, have also started to become more similar. Nevertheless, differences continue to persist (Elkins et al. 2006). Japanese BITs until 1999 were very basic and only since 2002 Japan started to conclude high-style BITs including not only investment protection, but also liberalization clauses (UNCTAD 2007a).

2.2. Theoretical and Empirical Background

- **FDI theory**

Foreign direct investment occurs when a firm establishes or acquires an entity abroad with the intention to exert lasting influence. In the case of vertical FDI the different stages of the value generating process of the firm are split up across borders. Comparative advantages of different locations are sought leading to labour or efficiency seeking FDI. Horizontal FDI is market-seeking: production is shifted to the foreign market when the costs of serving a market via exports are too high and render production at a central location with high economies of scale inefficient (Teece 1986).

Literature on foreign direct investment (FDI) determinants in the international business and trade fields is vast and rather inconclusive to such a degree that empirical research on FDI often relies on an ad-hoc specification of FDI determinants that results in diverging outcomes

(Blonigen 2005; Chakrabati 2001). *One theoretic approach that takes a macro perspective* and is widely applied in literature is grounded in the international new trade literature and uses gravity theory arguments to FDI (Braconier et al. 2005; Carr et al. 2001; Helpman et al. 2004; Markusen and Maskus 2002). In its origins the gravity model related bilateral trade flows positively to the size of markets, and inversely to factors enhancing or restricting trade flows among two countries (as tariffs or distance) (Andersen and Van Wincoop 2003). When applying it to FDI, the standard gravity explanatory variables have been extended to include relative factor endowment differences between the home and host country besides absolute and relative country size (e.g. Carr et al. 2001; Egger and Pfaffermayr 2004).

A different *line of reasoning* focuses on the multinational firm and the micro-level of international business activities in explaining FDI. Here, transaction costs, market imperfections and institutional uncertainties have been highlighted as major reasons for the internalization of activities across borders within one firm through FDI instead of carrying out exporting, licensing or other hybrid regimes such as non-equity strategic alliances to serve foreign markets (Buckley and Casson 1976; Witold J. Henisz and Williamson 1999; Witold J. Henisz 2003; Hennart 1982, 1991/2000; Rugman 1981; Teece 1986). Reasoning is rooted in the works of Coase (1937) and Williamson (1975). Characteristics along which the transactions and the costs incurred in the different governance regimes vary are the frequency with which the transaction occurs, the uncertainty surrounding the transaction, and the degree to which asset specific investments have to be carried out (Teece 1986; Williamson 1991).

The more frequent a transaction, the cheaper it becomes to internalize the cross-border activity within one firm. Furthermore, the higher the asset specificity the more risky inter-firm co-operations become encouraging FDI or simple trading: The asset specificity is high when one or both parties to a transaction invest in equipment which is especially designed to carry out the transaction. It has a much lower second best use value (Williamson 1979) increasing the risk of quasi-rent appropriation.

In the case of a highly uncertain environment, firms are expected to avoid ownership. Ownership commits them to one operation that may not be appropriate when a shift in the environment occurs (Williamson 1979). As companies have a higher risk premium when property rights and contracts are poorly enforced, when the risk of civil wars, coups, or an involvement in international conflicts is high, when the investment environment is unpredictable and when low quality institutions increase information asymmetries with regard

to market conditions, firms might be inclined to not carry out any investment in such environments, or, if they do, only at a lower scope (Witold J. Henisz and Williamson 1999; Teece 1986; Williamson 1991, 2000). FDI decisions thus positively depend on political credibility, property rights protection and constrained politicians (Witold J. Henisz and Williamson 1999; Williamson 1991). Besides these indirect effects, politicians can also directly influence the costs of carrying out investment e.g. through capital controls or the implementation of further investment or trade restrictions (e.g. OECD 2006).

International investment and trade agreements are one means through which governments can improve FDI attractiveness both indirectly and directly.

- **Credibility enhancing effect of international investment and trade agreements**

The theory of credible commitment emphasizes reputation-building and institutional design as two channels through which governments can credibly commit themselves and can guarantee a fair definition and eventual enforcement of property rights. In this context delegation of authority from the government to independent agents, such as international agreements, forms an important element (Drazen 2000; Kydland and Prescott 1977; Weingast 1995). International agreements help to overcome the problem of time inconsistent behaviour of governments as they are more credible than purely domestic commitments due to higher costs involved when reneging on them (Martin and Simmons 1998; Teece 1986). However, expropriation also provides rents to government and one can expect a leveling out of expected gains and losses associated with attracting FDI and thus the incentive for treaty compliance (Aisbett 2007; Ginsburg 2004, 2006; Witold J. Henisz and Williamson 1999; Teece 1986).

The credibility enhancing argument has been particularly made for bilateral investment agreements, but also for regional trade and investment agreements. regional agreements are not necessarily designed to increase intra-regional trade and factor flows, but rather to attract funds from extra-regional private investors and public donors (e.g. Haftel (2006), Buethel and Milner (2006)).

- **Liberalization effect of international investment and trade agreements**

In addition to increasing the credibility of policies carried out by the domestic governments, international investment and trade agreements include provisions that liberalize investment and trade rules dis- or encouraging new investment. As opposed to bilateral investment

treaties which mostly only deal with the treatment and protection of established FDI projects, investment liberalization included in the preferential trade and investment agreements often facilitates rules at the pre-establishment stage.

For the PTIAs, the link between trade liberalization and FDI is also of interest. Rules of origin favouring local or regional content and other non-tariff barriers such as voluntary export restraints or anti-dumping measures will lead to a higher propensity of outsider firms to establish subsidiaries in the region instead of exporting to it (Estevadeordal and Suominen 2005). A clear effect of tariff liberalization cannot be depicted and has not yet been formally modelled in literature (e.g. Medvedev 2006; Narula 2003). Treaty insider and treaty outsider effects need to be distinguished. Treaty insider effects occur when the investor home country is member to the regional agreement. Also, the type and motive of investment plays an important role.

For *agreement insiders vertical FDI* can be stimulated by intra-regional trade liberalization as inter-border corporate transactions are rendered cheaper due to a reduction in transaction costs. It becomes cheaper for companies to introduce a more efficient division of labour in order to benefit from comparative advantages in the different locations. In this respect an increase in FDI complements rising trade flows (Blomstrom and Kokko 1997).

In the case of *horizontal FDI* impact is less clear. Often, a trade-off between distance-related costs and realized economies of scale and scope through the concentration of business activities will lead to the decision whether to carry out an FDI or enter a country via trade. If tariff costs had been the major reason for a firm to invest in a country, a reduction of the latter might make trade cheaper to such an extent that trade is preferred to an FDI. However, if the original reason for carrying out horizontal FDI had not been “to hop tariffs”, the impact of trade liberalization measures is expected be the opposite: here, a rise of FDI is predicted as the link to corporate headquarters is eased through the reduction in transaction costs and operations are expected to become more efficient (Blomstrom and Kokko 1997; Medvedev 2006).

In addition, for investors from countries outside the *agreements* the level of tariffs at the border is of importance. In the case that the region imposes common external tariffs, the need to be “jumped” through outsider FDI emerges (Chase 2004). The use of certain locations within a region as “beachhead location“ to serve the markets of the other nations has been

highlighted by Ethier (2001): Companies invest in one country and then utilize its trade preferences to trade with the other countries leading to a positive investment effect. However, this can also lead to investment deduction in the case of MNEs that have already been active in the region and then streamline their activities (Neary 2002).

The *initial situation of a region* will be of large importance for the attraction of additional outsider-FDI (Bertrand 2004; Blomstrom and Kokko 1997; Medvedev 2006): If the regional market had been highly segmented before integration through trade liberalization started, the attractiveness of a larger common market for inducing additional FDI is high as break-even points of investment might be surpassed. If segmentation had been low in the beginning, the additional advantage of a regional common market is much lower (Blomstrom and Kokko 1997). However, even if highly segmented markets get integrated, regional agreements will have no impact if the total of the markets only has a low market or skills potential. Furthermore, the positioning of a country within the region is of relevance. Benefits are *not equally distributed within a region*. Those locations within a region will win that have the highest location advantages. Following the argumentation of Baldwin and Venables (2004) integration is expected to lead to an agglomeration of economic activity in particular locations.

Trade agreements also exercise a *dynamic impact* as a larger integrated market will lead to increased competition and intra-regional mergers and acquisition. This is expected to raise economies of scale, promotes efficiency and thus influences economic growth which then attracts further insider and outsider investment (Blomstrom and Kokko 1997). However, as Neary (2002; Neary forthcoming) argue, stronger competition in a region might drive out foreign investment.

- **Empirical Evidence**

Empirical evidence for the *credibility enhancing effect in the case of BITs* is ambiguous. Depending on the set-up of the studies, the outcome diverges. The first articles relying on cross-sectional analysis and reduced sample specifications have found no significant impact of the agreements (Hallward-Driemeier 2003; Tobin and Rose-Ackerman 2005) while the later studies by e.g. Egger und Pfaffermayer (2004) and Neumayer and Spess (2005), most of them using panel data, detect the opposite. During the past two years, the existing frameworks have been improved by accounting for the endogeneity of the BIT conclusion coming to contrasting conclusions either negating a robust influence of the treaties (Aisbett 2007) or

confirming the latter (Busse et al. 2007; Egger and Merlo 2007). More recent studies work on the data and variables included in the specifications and find robust positive evidence for those BITs which include clauses on investor state arbitration (Yackee 2006), that only dyads that include a developed and a developing countries are successful (Fortanier 2008; Jandhyala et al. 2007) and that the marginal impact of a BIT is reduced the higher the number of BITs a country has signed (Fortanier 2008; Tobin and Busch 2007).

Evidence on the *role of the agreements for Japanese business activities* has only been descriptive: Yanase (2003), discussing yearly financial FDI data, does not find any evidence for a positive FDI effect for the BITs while the Japanese Bank of International Co-operation (2007) shows a positive impact averaging the FDI data over three years prior to and after the treaty ratification. However, no econometric techniques are used to control for other possible determinants of the rise in FDI in these countries.

With regard to the impact of *the preferential trade and investment agreements on FDI activities in developing and emerging economies*, the empirical studies can be divided into three kinds: those that focus on selected regional agreements in detail and analyse their impact on FDI²; those that use a dummy variable as explanatory variable for agreement conclusion, and those that try to fill the black box of agreement conclusion with regard to treaty contents or member nations characteristics (e.g. Dee and Gali 2003; Lederman et al. 2003; Medvedev 2006; Te Velde and Bezemer 2006).

In order to capture *agreement membership* the agreements as notified to the WTO are very often used either cumulative or as a dummy in the estimations (e.g. Buethe and Milner 2006). Some extend this measure by additional agreements (Medvedev 2006), others restrict themselves to a sub-set of these – focusing on regional agreements (Levy et al. 2003; Te Velde and Bezemer 2006). Membership itself has either been found positive (Buethe and Milner 2006; Levy et al. 2003) or insignificant (Medvedev 2006). Overall, the authors conclude that agreement impact is contingent on *market characteristic* in particular in terms of aggregate market size of the agreement member countries (Jaumotte 2004; Lederman et al.

² E.g. for NAFTA (Blomstrom and Kokko 1997; Buckley et al. 2000), the EU (e.g. Brenton et al. 1999; Clegg and Scott-Green 1999; e.g. Dunning 1997a; 1997b; Iwasaki and Suganuma 2007), for MERCOSUR (e.g. Blomstrom and Kokko 1997; Page 2001), and for ASEAN (e.g. Haftel 2006).

2003; Levy et al. 2003; Medvedev 2006; Te Velde and Bezemer 2006). With respect to the *contents of the agreements*, Dee and Gali (2003) find that the majority of the investment impact comes from non-trade provisions and are thus of larger relevance than the trade clauses in the agreements (Dee and Gali 2003). Te Velde and Bezemer (2006) confirm the importance of regional investment provisions.

To summarize, though most studies conclude that bilateral investment treaties have a positive influence, the reason for the latter has not been fully explored. The analyses up to now have omitted FDI heterogeneity. Also, the role of the preferential trade and investment agreements for FDI in developing and emerging economies is ambiguous in theory and strongly depends on the kind of FDI that is carried out, none of the existing empirical cross-country studies accounts for such differences.

2.3. Hypotheses Development: Firm heterogeneity and international agreements

Empirical research has thus up to now not accounted for FDI heterogeneity. However, focusing on differences according to FDI type linking transaction cost theory with institutional theory in general, and with the international agreement effectiveness literature in particular, should lead to new insights. Thus, based on the previous argumentation the following hypotheses are derived:

Hypothesis 1: Investment protection agreements will increase FDI activities in the case of large-scale investments

Insecure environments with low property rights protection lead to a general hold-up problem for large-scale investments. When owners fear that the value of the assets deployed in the country cannot be fully realized due to bad property rights protection and the risk to not be able to appropriate returns increases, the value of these assets decline in general (Anderson and Gatignon 1986; Teece 1986). Investment protection agreements can work as safeguards in this context and raise the investment level.

Hypothesis 2: Investment protection agreements will lead to higher FDI in the presence of high asset specificity

FDI as opposed to the foreign market entry mode “trade” is more likely to occur when the specificity of the assets transferred to the foreign affiliate rises as the hazard associated with market-based exchanges rise and the incentives to internalize the transaction become larger

(Teece 1986; Williamson 1991). The more uncertain and volatile the external environment of a firm, the less likely a firm is to transfer these assets to the country due to the increased appropriability risks (Anderson and Gatignon 1986). Investment protection agreements can work as safeguards in this context and raise the investment level.

Hypothesis 3: Preferential Trade and Investment Agreements will promote both horizontal and vertical FDI in the case of highly asset specific investments.

Trade liberalizing agreements are expected to have a higher impact on highly-asset specific FDI for both horizontal and vertical FDI. As opposed to non-asset specific horizontal FDI, which can be easily replaced by exporting or licensing, asset-specific FDI such as in the case of knowledge-intensive products or processes cannot be replaced by arms-length trading (Blomstrom and Kokko 1997; Medvedev 2006).

Hypothesis 4: Preferential Trade and Investment Agreements promote vertical FDI in general.

In general, vertical FDI can be stimulated by intra-regional trade liberalization as inter-border corporate transactions are rendered cheaper due to a reduction in transaction costs. It becomes cheaper for companies to introduce a more efficient division of labour in order to benefit from comparative advantages in the different locations. In this respect an increase in FDI complements rising trade flows (Blomstrom and Kokko 1997).

3. NON-STANDARD DATA

3.1. Foreign Direct Investment

The size of foreign direct investment activities is captured in terms of subsidiary employment of Japanese firms in the host countries as opposed to the previously quoted studies in the agreement effectiveness literature which use the flow or stock FDI measures as provided by the Organization of Economic Cooperation and Development (OECD) and the United Nations Conference on Trade and Development (UNCTAD). Interpretation of OECD and UNCTAD figures is difficult due to the varying data collection methods across countries. Furthermore, round-tripping and trans-shipment of investment distorts financial data. (UNCTAD 2006a). Literature in international business and the international trade tradition has thus used number of affiliates, sales and employment data for measurement of the productive activities of

affiliates of multinational companies – constituting FDI – abroad (e.g. Lipsey 2007) . Due to data availability I will focus on employment following a recent stream of literature in this regard (Asiedu 2004; Belderbos and Zou 2006, 2007; Zhou et al. 2002). Employment is well apt for the analysis in developing countries as investment is expected to be primarily labour-seeking due to the existence of factor price differentials.

Data on foreign direct investment is based on microdata of affiliates of Japanese firms abroad obtained from the Toyo Keizai’s annual compendia on Japanese overseas investment (ToyoKeizai Annual volumes 1990-2005). The dataset is compiled annually from surveys and is supplemented with information from annual reports and media announcements. It reputedly represents the total of Japanese foreign investment activity and enjoys increasing acceptance among academic researchers (e.g. Delios and Henisz 2003; Makino et al. 2004). The survey is sent out to both listed and non-listed firms and thus covers investments by small, medium-sized and large businesses.

In order to obtain industry- and country level data, I aggregated the affiliate data on the industry-country level per year. I did not construct an affiliate or parent firm-country panel in order to be able to also account for those developing and emerging economies in the set-up that have not (yet) received any investment. Thus, I considered 135 developing and emerging economies and 23 industries – assigning an industry-country year pair the relevant aggregated affiliated data or the value 0 when no investment had occurred. All those countries are included in the set-up that have been classified by the World Bank as developing countries in 2003 (gross national income below \$11,115) plus those countries classified as emerging economies by the Economist at some point during the sample period.

I aggregated the affiliate level employment information to two foreign direct investment variables for the years 1990-2004 – one which only includes the employees of large-sized investments, and one which, on top of these, counts also the ones of the smaller-sized subsidiaries. Both measure the sum of the share of employment in the affiliates which can be attributed to the Japanese parent firms p in industry j in country i in year t .

$$Y_{ijt} = \sum_{p=1}^P \% \text{ Japanese ownership (min. 10\%)}_{ijtp} * \text{Affiliate Employment}_{ijtp}$$

Thus, the employment of the subsidiary is multiplied with the share of overall Japanese ownership in the subsidiary. If several Japanese firms invested in the affiliate, the sum of their

ownership stakes was used. Only employment of those subsidiaries is considered for the two measures in which Japanese firms own at least 10%.³ General FDI includes all affiliates – small and large ones – with complete employment and ownership information in the database in the aggregation and with a minimum level of Japanese employment of 2. The second variable, large scale FDI, includes only those affiliates which have at least 100 Japanese FDI employees. For instance in 2003 only 17% of the affiliates included in the general FDI sample enter into the “large-scale” FDI sample. The affiliates entering the general FDI sample were located in 76 developing or emerging economies while the large scale ones only in 53 of them.

3.2. Parent-Firm Information

To account for industry heterogeneity the average company size per industry is included in the regressions. Furthermore, parent firm information was used to derive a value for the asset specificity of the investment. Parent firm information stems from the industrial financial indicators collected by the Development Bank of Japan (DBJ) for the years 1989-2003. These are based on consolidated financial data from listed companies - excluding financial and insurance companies.⁴ The database is extensively used by Japanese researchers (e.g. Fukao and Kwon 2006). The values of listed parent firms were averaged for each industry and this average was then applied to the foreign investment of both listed and non-listed firms.

The *average company size* is measured as the average Net Sales of the listed companies per industry. Mean and Median values for each industry are provided in table T 8 in the appendix. Following e.g. Delios and Beamish (1999), R&D Intensity (*R&D Ind. Mean*), measured as the Research and Development expenses over Net Sales of listed parent firms, is used as a measure for the *asset specificity* of the FDI. However, it is only a rough proxy as it captures parent firm characteristics instead of the transaction, thus FDI, characteristics. Though a parent firm can be highly R&D intensive, the investment carried out in a certain country

³ An interest of 10 percent or more of the stock or voting power of the foreign enterprise has been defined as the threshold level for a long-term interest – as opposed to a short term interest as in the case of portfolio investment – by the OECD FDI benchmark definition (OECD 1996) and in the IMF’s Balance of Payments Manual IMF (IMF 1993).

⁴ Listings have to be on either the first or second sections of the Tokyo, Osaka or Nagoya stock exchanges to enter the database. Furthermore, firms must have been listed on a Japanese stock exchange for eleven years or more.

might not be. Furthermore, as industry aggregates of these parent firm measures are taken, only a rough proxy is attained. For a discussion of the difficulty of measuring asset specificity see e.g. Joskow (1988). In the database, the R&D time series has a structural break due to a change in data-reporting for R&D expenses: prior to 1999 only manufacturing and non-manufacturing research costs and not the development costs are included. After 1999, both components are reported. As such, regression analysis has to account for the jump in the data in 1999 by means of an interaction effect of the R&D intensity measure with a dummy variable for the years 1999-2004 (*R&D Ind. Mean* ≥ 1999). Table T 8 additionally presents the number of parent firms which are used to calculate the industry average.

4. EMPIRICAL SET-UP

4.1. Methodology

As explained in section 3.1, the dependent variable y , employment, is a partly continuous non-negative variable which has a positive probability mass at one point – at 0. Least squares estimation is inconsistent on such corner solution data as it assumes constant partial effects and predicts negative values (Wooldridge 2002). In order to avoid the pile up at 0, most studies on FDI have omitted the no-investment observations and have simply carried out Least Squares estimation. However, the decision not to invest in a country can tell a lot about the relevance of the explanatory variables for the investment outcome. A Tobit model can be used in this context. It allows separating the decision whether to go international from the decision on how much to invest, thus, how many employees to employ. The Tobit model has been commonly used in the FDI literature (e.g. Claudia M. Buch and Lipponer 2007; Carr et al. 2001; e.g. Verbeek 2004; Zhou et al. 2002). In the agreement effectiveness literature only two studies have used a Tobit model (Busse et al. 2007; Dee and Gali 2003) though these two omit the “Zero-observations”.

Using a pooled model when the data is of panel nature leads to the problem of apparent serial correlation. Using panel data has the major advantage that omitted variable bias is reduced as unobserved heterogeneity can be accounted for – either as fixed or as randomly drawn from some distribution (Verbeek 2004). In a standard ordinary least regressions panel context unobserved heterogeneity can either be treated as fixed or random. However, as nonlinear models are estimated through maximum likelihood and as the latter leads to a substantial bias in the estimated variances subsequently underestimating the standard errors in the case of

fixed effects, the estimation of random effects is recommended (Greene 2004).

The standard tobit model for a country-industry panel ij is

$$y_{ijt}^* = \beta'X_{ijt} + \lambda_{ij} + u_{ijt}$$

$$\lambda_{ij} \stackrel{iid}{\sim} Normal(0, \sigma_\lambda^2)$$

$$u_{ijt} \stackrel{iid}{\sim} Normal(0, \sigma_u^2)$$

$$y_{ijt} = \max(0, y_{ijt}^*).$$

for $i = 1, \dots, N; j = 1, \dots, M; t = 1, \dots, T$.

The sub-index i refers to the country, j to the industry, and t to year. X_{ijt} refer to the vector of explanatory variables, β to the vector of their coefficients. The country-industry specific effects λ_{ij} and the error u_{ijt} are both normally distributed and independent from each other and the explanatory variables with the respective standard errors σ_λ and σ_u .

y_{ijt}^* is the latent dependent variable for the industry-country panel ij in period t which can be interpreted as the propensity that Japanese companies have positive employment in a country in a certain year due to the explanatory variables (Wooldridge 2002). The dependent variable y_{ijt} has a minimum value of 0. The expected value of the dependent variable $E(y_{ijt} | X_{ijt})$ depends on two elements: the probability that y_{ijt} is positive, thus that some Japanese company invests in country i , $P(y_{ijt} > 0 | X_{ijt})$, and the expected value for y_{ijt} when it is positive, which refers to the scale of investment involvement $E(y_{ijt} | X_{ijt}, y_{ijt} > 0)$. An indicator function selects the appropriate density for each of the two possible cases – if employment is 0 or if employment takes on a positive value. A normal cumulative distribution function is assumed (Wooldridge 2002). For details on the log-likelihood see the appendix A 1.

To interpret the impact of the explanatory variables on the outcome of the dependent variable y , the partial derivatives of continuous variables for the expected value can be decomposed into two parts: 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 and Moffit 1980).⁵

$$\frac{\partial E y_{ijt} | X_{it}}{\partial x^k} = P(y_{ijt} > 0 | X_{ijt}) \left(\frac{\partial E(y_{ijt} | X_{ijt}, y_{ijt} > 0)}{\partial x^k} \right) + E(y_{ijt} | X_{ijt}, y_{ijt} > 0) \left(\frac{\partial P(y_{ijt} > 0 | X_{ijt})}{\partial x^k} \right),$$

In the output tables the three relevant marginal effects for interpretation purposes are

$$(1) \left(\frac{\partial E(y_{ijt} | x_{ijt}, y_{ijt} > 0)}{\partial X_{ijt}} \right) \text{ as e, } (2) \frac{\partial E y_{ijt} | x_{it}}{\partial X_{ijt}} \text{ as y, and } (3) \left(\frac{\partial P(y_{ijt} > 0 | x_{ijt})}{\partial X_{ijt}} \right) \text{ as p. They are}$$

measured at the means of the explanatory variables.

4.2. Empirical Model

The empirical model in detail is as follows:

$$\log Y_{ij(t+1)} = \max(0, \alpha_0 + \beta'_F F_{it} + \beta'_X X_{it} + \beta'_I I_{jt} + T_t + \varepsilon_{ijt})$$

The explanatory variables are all lagged by one period to mitigate the endogeneity problem where F_{it} refers to the focus variables, X_{it} to country level economic and political control variables, and I_{jt} to industry characteristics. Time dummies T_t for all years t but the first year are included to control for global shocks. Datasources of the variables and descriptive statistics are provided in table T 9 and table T 11 in the appendix.

The sample includes the years 1990-2004 and 135 developing and emerging economies (see section 3.1 and table T12 in the appendix). Following the set-up of Baltagi et al. (2006) an industry-country panel is constructed. N_t refers to the industry-country pairs. The total number of observations for all industries (for non-service industries) is $n = \sum_{t=1}^T N_t = 45,725$ (38,409)

based on 3,375 (2,835) unique country-industry pairs over 135 countries and 23 (20)

⁵ For binary variables (e.g. entry into force of an agreement), the difference between the value when the variable takes on the value 1 and when it is 0 is taken.

manufacturing, primary sector and service (non-service) industries.

As explained in section 3.1 the dependent variable Y_{it} measures the share of employment in the affiliates which can be attributed to all Japanese owners in country i in industry j in year t - general FDI Y_{it} and large-scale FDI $Y_{Ls_{it}}$. To reduce the skewness in the data a natural logarithmic transformation is applied (Wooldridge 2006: 520). Though the dependent variables are not stationary, the variables are cointegrated with the explanatory variables. The Johansen Cointegration test shows that at least one cointegration relationship exists.

F_{it} refers to the focus variables – the international investment agreements – analysed. The ratification of a *bilateral investment treaty (BIT)* with Japan is accounted for with a dummy variable which is 1 if the destination country i has ratified a bilateral investment treaty with Japan in or prior to year t . Otherwise it is 0. Five measures for *Trade and Investment Agreements* are separately included in the regressions: In the beginning, a dummy variable which captures membership for country i in year t in at least one trade and investment agreement as notified to the WTO (*WTO-PTIAs*) is integrated in the regressions. Then, I will focus on selected regional trade and investment agreements (RTIAs) based on Te Velde and Bezemer (2006). These are the Common Market for Eastern and Southern Africa (COMESA), the Southern African Development Community (SADC), the North American Free Trade Agreement (NAFTA), the Southern Common Market (MERCOSUR), the Andean Community (ANDEAN), the Caribbean Community (CARICOM), and the Association of South East Asian Nations FTA (AFTA). First, I will insert a dummy that takes the value one for the years when a country is member to one of these RTIAs (year of entry) (*Membership RTIAs*). In a next step, the relevance of the additional market size generated through the agreements is taken account of by taking the natural logarithm of the sum of the total GDP of the partner countries (*Log Add. Reg.GDP*) (see also Lederman et al. (2003) and Medvedev (2006)). I also apply the indices of trade (*Trade Index*) and investment liberalization (*Inv. Index*) which have been developed by Te Velde and Bezemer (2006) for these agreements where the values 1-3 indicate differing levels of trade or investment liberalization (3 being the highest), and 0 relating to no liberalization at all. For details see the appendix table T 6.⁶

6 Problems may arise due to the rather rough, linear, and ordinal scaling. However, it can generate general

The industry characteristics I_{jt} , firm size measured as Net Sales (*Net Sales*) and R&D intensity (*R&D Ind. Mean* or *R&D Ind. Mean* ≥ 1999), have been explained in section 3.2. Overall, a positive sign is predicted for both R&D intensity and firm size: The more R&D intensive the industry, the higher the employment. The higher the net sales, the more productive the company, and the larger the expected foreign investment activities (Helpman et al. 2004).

Economic and political control variables X_{it} (time variant) and X_i (time invariant) are included for each host country. The economic variables are motivated by gravity reasoning (see section 2.2) modeled after a specification which has been used by Buch et al (2005)⁷. The size of the host economy is proxied by the natural logarithm of the gross domestic product (*Log GDP*). It is proposed that the larger the market, the more market-seeking FDI will be attracted. The natural logarithm of distance is used as a measure for distance related transaction costs such as transportation costs (*Log Distance*). In the case of horizontal FDI, FDI should increase with distance to serve a market. In the case of vertical FDI, FDI should decrease as distance related costs grow. Furthermore, in line with geographic distance institutional distance (including psychic and cultural distance) is expected to grow discouraging FDI (Egger and Pfaffermayr 2004). Due to the nature of the dependent variable which captures employment and as such vertical labour-seeking FDI, Japanese FDI activities can be expected to decrease as distance increases.

One further measure for the economic similarity of the host and home countries (*Similarity*) is included which is measured as the host country's GDP per capita divided by Japanese GDP per capita Buch et al. (2005). Cost reduction motivated FDI will occur when countries are dissimilar in factor costs while market motivated will occur in the case of similar countries. As labour-seeking FDI should play an important role in developing countries, a negative coefficient is predicted (Markusen and Venables 2002). Thus, the similarity measure also serves as a proxy for wage differentials between Japan and the host economy. A country's

insights.

⁷ Carr et al. (2001), Braconier et al (2005) and Egger and Pfaffermayr (2004) model the gravity model including a variety of interaction effects – however, these models have been criticized on statistical grounds, in particular with regard to multicollinearity due to the interaction variables and have been found to match cross-sectional data better than panel data (Egger and Merlo 2007).

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

With respect to the political control variables X_{it} the *domestic institutional political environment* of each host country at time t is measured by the political constraints index (*POLCON*). The index attempts to objectively measure the political institutional stability of an economy through the feasibility of policy change in a country, thus “the extent to which a change in the preferences of any one actor may lead to a change in government policy” Henisz 2002 (2002).⁸The larger the value, the more constraints exist. It is proposed that the more constraints there are, the more difficult it becomes to change policies making the business environment more predictable for the firm. Thus, a positive relationship with FDI is predicted.

The Japanese government is known to strongly support Japanese companies abroad. Amongst others, the positive role of Japanese official development assistance (ODA) for FDI through a positive infrastructure, information generating, business system transplanting, and investment securing effect has been established in empirical studies (Blaise 2005; Kimura and Todo 2007; Tuman and Strand 2006). Thus, as a measure for Japanese home government activities supporting Japanese firms abroad the amount of *official development aid* which is disbursed by Japan (*Log Jap. ODA*) is added to the analysis. It includes both grants and loans. The natural logarithm is taken. If in certain years no value for Japanese ODA spending was indicated for a country, but some other donor had provided aid, zero Japanese ODA disbursements were assumed. Negative flows are set to 0 after the positive values have been transformed.

In order to account for a country’s trade policies, its commitments to open markets and liberal economic policies membership to the World Trade Organization (WTO) (*WTO member*) is

⁸ POLCON measures the number of independent branches of government representing veto players, the party alignment of the executive and legislative branches, and alignment within the legislative branch. An additional veto player decreases the likelihood of a policy change, but with diminishing returns, and the homogeneity of party preferences within an opposition branch of government increases constraints. Spatial modelling techniques are used to derive a value between 0 and 1.

included in the analysis. However, as most countries belong to the WTO nowadays, impact of pure membership on a country's FDI attractiveness is questionable per se (Rose 2003).

The *four previously derived hypotheses* on the role of FDI heterogeneity for agreement effectiveness will be tested as the following:

T 1: Hypotheses and Empirical Testing

Hypotheses	Operationalization
Industry-Country Panel	
Hypothesis 1 Investment protection agreements will increase FDI activities in the case of large-scale investments	Large-scale FDI is used as the dependent variable: The BIT coefficient is expected to be positive & significant
Hypothesis 2 Investment protection agreements will lead to higher FDI in the presence of high asset specificity.,	Interaction effect between R&D intensity of the parent firms (industry average) and the BIT is expected to be significant and positive.
Hypothesis 3: Preferential Trade and Investment Agreements will promote both horizontal and vertical FDI in the case of highly asset specific investments.	Interaction effect between R&D intensity of the parent firms (industry average) and the PTIAs is expected to be significant and positive.
Industry Panel	
Hypothesis 4: Preferential Trade and Investment Agreements promote vertical FDI in general	Turn to sector regressions to better understand industry differences. According to the mapping of sectors to FDI motivation by Schulz (2007) vertical, efficiency-seeking FDI is common in the machinery, electrical equipment, computers, and transportation equipment. These industries should have a positive and significant PTIA coefficient.

The relevance of FDI heterogeneity for agreement effectiveness will be tested in the industry-country panel before I turn to sector-level regressions. In this context I will also test for the homogeneity of the coefficients of the pooled model. As it is hypothesized that the agreements differentially influence firms from different industries, it is expected that the homogeneity of the slopes in the pooled model is rejected.

5. RESULTS & DISCUSSION

5.1. Results: Industry-Country Panel

Estimations are carried out for Japanese affiliate employment including service and non-service industries. In all specifications, the control variables have the expected signs. Market size measured as *Log GDP* exercises a positive and significant impact. The *similarity*

coefficient carries the expected negative sign, thus, the more similar the host country with Japan, the lower the employment. 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. Japanese ODA plays a positive role for Japanese investment. *WTO membership* is insignificant.

- **FDI Size and international investment agreements**

Concerning the relevance of the *BITs*, the size of the FDI included plays a role which confirms *hypothesis 1*. Using general FDI as the dependent variable (table T 2, columns 1-2), thus including all affiliates also the smaller-sized ones, BITs are of relevance, but not robustly at the 1% level when limiting the sample to developing countries (table T 2, column 2). When omitting China the significance level drops further, when including other explanatory variables, Japanese BITs become completely insignificant.(see the appendix table T 16). Also the economic significance, thus the rise in employment due to the conclusion of a BIT, falls strongly when reducing the country sample – from 11 – 5% for conditional employment (in those countries and industries in which employment has occurred) and 4-2% in the case of unconditional employment when only including developing countries.

When limiting the affiliates included in the dependent variable calculation to those with an affiliate size of at least 100 employees, the agreement is always of 1% significance (table T 2, columns 2-4), also when changing sample sizes and the included variables (appendix table T 16 columns 2,4,7). Here, also the economic impact remains quite stable. A BIT raises the Japanese employment in the countries with positive employment by about 20-25% at the mean values of the other explanatory variables. The unconditional effect, including the zero-investment countries, lies at about 3-5%: The probability of an industry entering a country is raised by 0.7-1.1% through the conclusion of a BIT. Hence, this provides evidence for the fact that BITs are mostly then of relevance when significant investments are involved for which investment protection plays a larger role than for small investments.

With regard to the role of *the PTIAs* for FDI activities, a positive impact is shown for both general and large-scale investments – however, significance and magnitude is here lower for the large-scale investment. Thus, this provides only minor evidence for an investment protecting role of PTIAs

T 2: Tobit – Industry-Country Panel

	(1) General FDI		(2)		(3) Large Scale FDI		(4)	
	All Countries	<i>ME (e, y, p)</i>	Only Develing Countries	<i>ME (e, y, p)</i>	All Countries	<i>ME (e, y, p)</i>	Only Develing Countries	<i>ME (e, y, p)</i>
Log GDP	3.226*** (0.133)	0.45 ;0.16 0.049	3.523*** (0.197)	0.46 ;0.14 0.041	5.110*** (0.184)	0.54 ;0.08 0.021	5.920*** (0.217)	0.59 ;0.07 0.017
Similarity	-6.964*** (0.935)	-0.97 ; -0.35 -0.105	-12.61*** (3.060)	-1.64 ; -0.50 -0.146	-14.92*** (1.427)	-1.59 ; -0.24 -0.061	-34.67*** (5.146)	-3.48 ; -0.42 -0.099
POLCON	0.577*** (0.143)	0.08 ;0.03 0.009	0.824*** (0.176)	0.11 ;0.03 0.010	1.331*** (0.256)	0.14 ;0.02 0.005	1.914*** (0.319)	0.19 ;0.02 0.005
Log Distance	-3.697*** (0.337)	-0.51 ; -0.19 -0.056	-3.444*** (0.446)	-0.45 ; -0.14 -0.040	-4.870*** (0.491)	-0.52 ; -0.08 -0.020	-4.490*** (0.648)	-0.45 ; -0.05 -0.013
Trade Openness	0.0163*** (0.00150)	0.002 ;0.001 0.000	0.0158*** (0.00196)	0.002 ;0.001 0.000	0.0298*** (0.00254)	0.003 ;0.000 0.000	0.0325*** (0.00353)	0.003 ;0.000 0.000
Jap. BITs,	0.778*** (0.141)	0.111 ;0.044 0.013	0.409** (0.201)	0.054 ;0.017 0.005	2.229*** (0.251)	0.250 ;0.047 0.011	1.928*** (0.399)	0.202 ;0.029 0.007
WTO- PTIAs	0.605*** (0.0781)	0.08 ;0.03 0.009	0.703*** (0.0947)	0.09 ;0.03 0.008	0.503*** (0.136)	0.05 ;0.01 0.002	0.586*** (0.168)	0.06 ;0.01 0.002
WTO- Member	-0.102 (0.108)	-0.01 ; -0.01 -0.002	-0.125 (0.134)	-0.02 ;0.00 -0.001	-0.192 (0.181)	-0.02 ;0.00 -0.001	-0.371* (0.223)	-0.04 ;0.00 -0.001
Log Jap. ODA	0.0391*** (0.00493)	0.005 ;0.002 0.001	0.0555*** (0.00684)	0.007 ;0.002 0.001	0.0456*** (0.00828)	0.005 ;0.001 0.000	0.0492*** (0.0118)	0.005 ;0.001 0.000
Constant	-52.18*** (4.472)		-62.16*** (6.346)		-94.90*** (6.282)		-118.7*** (8.530)	
Observatio ns	45725		43150		45725		43150	
Cou.-Ind. Pairs	3375		3200		3375		3200	
Uncensored	6410		5040		3986		2999	
σ_λ	6.664		7.085		9.664		10.74	
σ_u	1.827		2.030		2.447		2.717	
Chi- Squared	1241		851.5		1274		1243	
Log- Likelih.	-16969		-14224		-11938		-9530	
ML Cox Smell			0.27		0.24		0.21	
Mc Fadden Pseudo R2	0.37		0.35		0.35		0.33	

Results are tobit estimates. The dependent variable Y_{it} 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 marginal effects e, y and p at the means of the explanatory variables are reported next to the coefficients (for detailed explication see section 4.1). 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.

All measures used for PTIAs play a positive role: Using the index which captures membership in at least one trade (and investment) agreement as notified to the WTO (*WTO-PTIAs*), a positive and significant coefficient for general FDI is revealed (table T 2, columns 1 and 2). Being member to an agreement increases Japanese employment by 8-9% given the outcome is positive at the means of the explanatory variables. The probability of an industry entering a country rises by 0.8-0.9%. Overall, Japanese employment increases by 3-4% by being member to at least one of the PTIAs.

When turning to the selected seven RTIAs (table T 3), simple membership in the latter leads to about a 4% increase in employment at the means of the explanatory variables in those countries where Japanese companies have invested or to a 1.5% increase in Japanese employment overall. The additional GDP generated through the selected regional agreements also plays a significantly positive, though in economic terms minor role. Here, a 0.2 % increase of Japanese employment occurs if the additional GDP of the RTIA increases by 1% (or 0.1% in the uncensored case). Also, the investment and trade indices as developed by Te Velde and Bezemer (2006) point into this direction: They show the hypothesized signs – a 2-3% increase in Japanese employment results from a liberalization of trade and investment provisions respectively for those countries with positive employment, and about a 1% in the unconditional case. Hence, results obtained by Te Velde and Bezemer (2006) for US and UK FDI are confirmed for Japanese FDI.

When running the regressions only for “large size” FDI, the PTIAs as notified to the WTO (table T 2 column 3, 4) continue to be statistically significant, though the magnitude of the effect is reduced. In the case of the regressions using the selected RTIAs as explanatory variables significance levels fall and the economic impact is reduced (table T 3, columns 5,6). Thus, this does not confirm an investment protecting role of PTIAs in addition to the liberalization argument as proposed for instance by Haftel (2006) and Buethel and Milner (2006). Small-sized subsidiaries that are established or expanded due to the increased attractiveness of a region seem to drive the positive and significant general FDI results. Hence, the investment protecting role for large-scale investments for BITs is confirmed – RTIAs are more important with regards to investment and trade liberalization.

T 3: Tobit Industry-Country Panel: Different PTIA Measures (all countries, for explanations see notes of T 2)

	(1)	(2)	(3)	(4)	(5)	(6)						
	General FDI	<i>ME (e, y, p)</i>	<i>ME (e, y, p)</i>	<i>ME (e, y, p)</i>	<i>ME (e, y, p)</i>	Large FDI	<i>ME (e, y, p)</i>	<i>ME (e, y, p)</i>				
Log GDP	3.243*** (0.135)	0.45 ;0.16 0.049	3.239*** (0.135)	0.45 ;0.16 0.049	3.151*** (0.132)	0.44 ;0.16 0.048	3.273*** (0.136)	0.45 ;0.16 0.049	5.163*** (0.205)	0.55 ;0.08 0.021	5.161*** (0.208)	0.55 ;0.08 0.021
Similarity	-7.406*** (0.950)	-1.03 ; -0.38 -0.112	-7.380*** (0.948)	-1.02 ; -0.37 -0.111	-6.991*** (0.908)	-0.97 ; -0.36 -0.106	-7.411*** (0.953)	-1.03 ; -0.37 -0.110	-15.37*** (1.421)	-1.63 ; -0.25 -0.062	-15.36*** (1.421)	-1.63 ; -0.25 -0.062
POLCON	0.640*** (0.144)	0.09 ;0.03 0.010	0.641*** (0.144)	0.09 ;0.03 0.010	0.602*** (0.141)	0.08 ;0.03 0.009	0.593*** (0.143)	0.08 ;0.03 0.009	1.401*** (0.257)	0.15 ;0.02 0.006	1.400*** (0.257)	0.15 ;0.02 0.006
Log Distance	-3.611*** (0.342)	-0.50 ; -0.18 -0.054	-3.606*** (0.341)	-0.50 ; -0.18 -0.054	-3.639*** (0.274)	-0.51 ; -0.19 -0.055	-3.652*** (0.342)	-0.51 ; -0.18 -0.054	-4.718*** (0.463)	-0.50 ; -0.08 -0.019	-4.719*** (0.455)	-0.50 ; -0.08 -0.019
Trade Openness	0.0170*** (0.00150)	0.002 ;0.001 0.000	0.0169*** (0.00150)	0.002 ;0.001 0.000	0.0148*** (0.00155)	0.002 ;0.001 0.000	0.0174*** (0.00150)	0.002 ;0.001 0.000	0.0306*** (0.00254)	0.003 ;0.000 0.000	0.0306*** (0.00254)	0.003 ;0.000 0.000
Jap. BITs,	0.757*** (0.142)	0.108 ;0.043 0.012	0.759*** (0.142)	0.108 ;0.043 0.012	0.792*** (0.141)	0.113 ;0.045 0.013	0.705*** (0.141)	0.100 ;0.039 0.011	2.223*** (0.254)	0.249 ;0.046 0.011	2.223*** (0.254)	0.249 ;0.046 0.011
Membership RTIAs	0.295*** (0.0858)	0.041 ;0.015 0.005							0.309** (0.142)	0.033 ;0.005 0.001		
Log Add. Reg. GDP		0.000 ;0.000 0.000	0.0113*** (0.00322)	0.002 ;0.001 0.000							0.0116** (0.00532)	0.001 ;0.000 0.000
Investment Index				0.205*** (0.0410)	0.03 ;0.01 0.003							
Trade Index						0.175*** (0.0596)	0.024 ;0.009 0.003					
WTO-Member	-0.126 (0.109)	-0.02 ; -0.01 -0.002	-0.131 (0.109)	-0.02 ; -0.01 -0.002	-0.127 (0.108)	-0.02 ; -0.01 -0.002	-0.172 (0.110)	-0.02 ; -0.01 -0.003	-0.212 (0.182)	-0.02 ;0.00 -0.001	-0.221 (0.182)	-0.02 ;0.00 -0.001
Log Jap. ODA	0.0388*** (0.00495)	0.01 ;0.002 0.001	0.0390*** (0.00495)	0.01 ;0.002 0.001	0.0398*** (0.00490)	0.006 ;0.002 0.001	0.0392*** (0.00496)	0.005 ;0.002 0.001	0.0444*** (0.00829)	0.005 ;0.001 0.000	0.0445*** (0.00828)	0.005 ;0.001 0.000
Constant	-53.30*** (4.438)		-53.24*** (4.428)		-50.79*** (4.082)		-53.79*** (4.515)		-97.53*** (6.452)		-97.48*** (6.466)	
Observations	45725(3375)		45725(3375)		45725(3375)		45725(3375)		45725(3375)		45725(3375)	
Uncensored	6410		6410		6410		6410		3986		3986	
$\sigma_d ; \sigma_u$	6.678;1.833		6.675; 1.832		6.649; 1.829		6.740; 1.833		9.686;2.450		9.689;2.450	
Log-Likelih.	-16993		-16992		-16985		-16995		-11943		-11943	
Mc Fadden Pseudo R2	0.36		0.36		0.36		0.36		0.34		0.34	

- **Asset Specificity and international investment agreements**

In order to test for the role of asset specificity, I include the two R&D Intensity measures (see section 3.2) into the regression (*R&D Ind. Mean*, *R&D Ind. Mean* ≥ 1999). In the case of general FDI (table T 4 column 1), R&D intensity is insignificant. In the case of large scale FDI (column 2), after recalculating the combined standard errors for the two coefficients of the R&D Intensity variables, R&D is overall significant, and, in total, has a positive influence on the level of FDI. This supports the argument that particularly R&D intensive industries undergo larger investments to minimize the risk that outsiders appropriate rents.

The interaction effects of R&D with the BITs and PTIAs are included in the estimations to analyze the relationship between asset specificity and bilateral investment treaties (hypothesis 2) as well as the preferential trade and investment treaties (hypothesis 3). The interaction effects are expected to be positive and significant: thus, the more R&D intensive the investment, the higher the relevance of the BITs and PTIAs, and vice versa. Looking at the results, the argument about the relevance of BITs as a FDI securing device for asset specific investments does not hold. The coefficient is insignificant even for large scale investments (Table T 4 column3) suggesting that no relationship between the two exists. The interaction effect of general FDI with the PTIAs, however, is in itself significant and positive, though only at the 10% significance level. When calculating the joint standard errors for R&D intensity and the interaction effect, the joint marginal effect turns insignificant.

Hence, the industry average of the R&D Intensity across parent firms seems to be no distinguishing factor for treaty effectiveness. Either there is no link between asset specificity and the treaties or using industry-averaged parent firm R&D intensity data is not a good proxy for the transaction specific asset specificity – as previously discussed.

T 4: Tobit – Industry-Country Panel: R&D effects

	(1)	(2)	(3)	(4)
	General FDI	Large Scale FDI	Large Scale FDI: IA Effect with Jap. BIT	General FDI: IA Effect with PTIAs
Log GDP	3.144*** [0.46] (0.123)	4.431*** [0.49] (0.406)	4.381*** [0.49] (0.452)	3.146*** [0.46] (0.124)
Similarity	-6.669*** [-0.97] (1.001)	-12.71*** [-1.42] (1.566)	-12.64*** [-1.41] (1.608)	-6.568*** [-0.95] (1.002)
POLCON	0.572*** [0.08] (0.152)	1.369*** [0.15] (0.262)	1.367*** [0.15] (0.262)	0.569*** [0.08] (0.152)
Log Distance	-3.951*** [-0.57] (0.309)	-5.233*** [-0.58] (0.478)	-5.229*** [-0.58] (0.477)	-3.945*** [-0.57] (0.309)
Trade Openness	0.0161*** [0.00] (0.00159)	0.0300*** [0.003] (0.00269)	0.0301*** [0.00] (0.00269)	0.0161*** [0.00] (0.00159)
Japanese BITs,	0.868*** [0.13] (0.153)	2.208*** [0.262] (0.262)	2.223*** [0.26] (0.417)	0.899*** [0.14] (0.154)
WTO-PTIAs	0.674*** [0.10] (0.0828)	0.624*** [0.07] (0.139)	0.625*** [0.07] (0.138)	0.519*** [0.08] (0.125)
R&D Ind. Mean	4.711 [0.68] (5.931)	35.04*** [3.903] (9.565)	35.11*** [3.92] (9.645)	0.914 [0.13] (6.378)
R&D Ind. Mean >=1999	5.774 [0.84] (3.754)	-7.743 [-0.862] (6.108)	-7.649 [-0.85] (6.164)	3.659 [0.53] (3.965)
Interaction R&D Ind. Mean & Jap. BITs			-0.868 [-0.10] (11.62)	
Interaction R&D Ind. Mean & PTIAs				8.001* [1.16] (4.857)
Log Japanese ODA	0.0403*** [0.01] (0.00521)	0.0543*** [0.01] (0.00849)	0.0545*** [0.01] (0.00856)	0.0407*** [0.01] (0.00521)
WTO-Membership	-0.140 [-0.02] (0.115)	-0.298 [-0.03] (0.187)	-0.297 [-0.03] (0.187)	-0.127 [-0.02] (0.115)
Constant	-46.73*** (4.156)	-73.27*** (10.85)	-72.07*** (11.80)	-46.78*** (4.173)
Observations,	33853,	33853	33853	33853
Country-Industry Pairs	2694	2694	2694	2694
Uncensored	5599	3636	3636	
σ_λ	6.091	8.178	8.122	6.094
σ_u	1.782	2.345	2.344	1.782
Chi-Squared	1337	773.0	742.0	1336
Log-Likelih.	-14519	-10599	-10599	-14517
Mc Fadden Pseudo R2	0.34	0.31	0.31	0.34

Results are tobit estimates. The dep. variable Y_{jit} is the nat. logarithm of the share of employment of the Japanese owners (total employment* invest. share of Japanese owners within the company). Expl. variables are lagged by one year. A group is defined as an industry in a country. Standard errors are given in parenthesis and the marginal effect e (conditional) at the means of the explanatory variables in brackets (for detailed explication see section 4.1). The estimates for year dummies are not reported, but are jointly significant. Data is for 1990-2004. *, **, *** is significance at the 10%, 5%, and 1% level, respectively.

5.2. Sector Level Estimates

The pooled panel data regressions are only valid under the assumption that the slope coefficients are homogeneous across country-industry pairs. Pesaran and Smith (1995) show that if homogeneous coefficients are falsely imposed, the pooled estimator is inconsistent even if T approaches infinity. As it is hypothesized that the agreements differentially influence firms from different industries, it is expected that the homogeneity of the slopes in the pooled model is rejected. In the following, the tobit panel with random country-industry effects and time dummies using the general FDI measure as dependent variable as presented in table T 2 column 1 is referred to as the pooled model.

Separate tobit regressions are run for the 23 sectors. Each sector is pooled across countries and over time including random country effects and time dummies. Positive entries vary from 100-628 industry-country pairs. The estimations show that parameters differ for the individual industries. For the output of the coefficients see table T 12 and T 13 in the appendix.

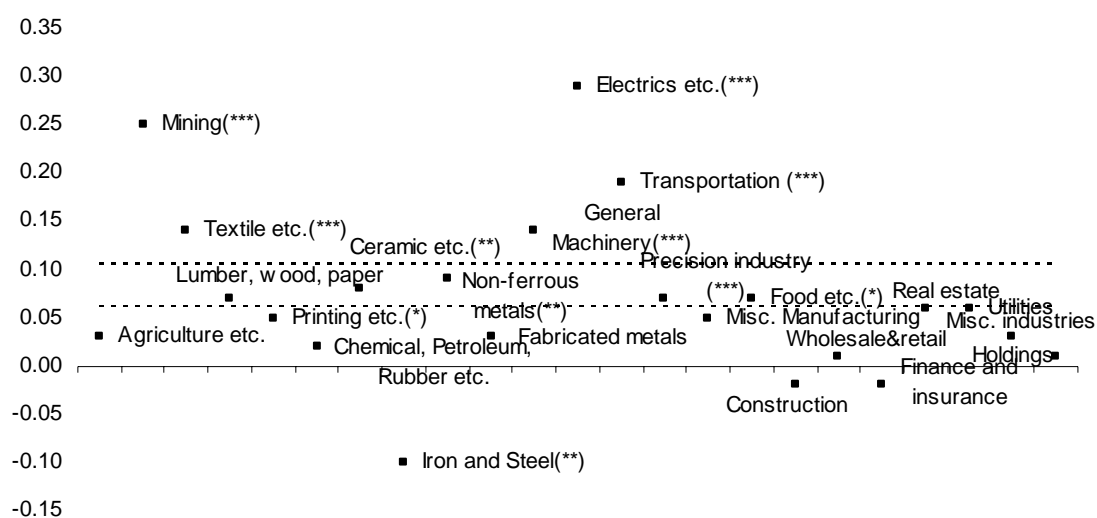
A standard Chow test (log-likelihood ratio test) is carried out for the null-hypothesis that the coefficients of the pooled model do not differ from the industry ones. The test statistic of all homogeneity restrictions in the pooled model is $\chi^2(572) = 2247.2 [0.00]$. Thus, overall, the slope coefficients vary significantly across industries clearly rejecting the null of homogeneous coefficients. Focusing only on the BIT and PTIA coefficients, I carry out Wald tests on the equivalence of the parameters across industries. In the case of BITs, the test statistics amounts to $\chi^2(22) = 44.40 [0.00]$, in the case of the PTIAs (*WTO-PTIAs*) it is $\chi^2(22) = 251.04 [0.00]$. Thus, in both cases the homogeneity of the slopes is rejected.

Following the approach of Meliciani (2000) I calculated a 95% confidence interval around the pooled marginal effect which measures the impact of the PTIA variable on the change in the dependent variable employment given that positive values are observed at the means of the explanatory variables (e in table T 2 column 1). Comparing the

outcome with the marginal effects of the individual sectoral regressions, the estimated marginal effect in most sectors lie outside the interval (see figure F3 and F4).

It seems as if the industries which are positively influenced, in particular the electrical machinery, transportation (mostly automotive) and general machinery industries are those sectors which are known for segmenting their value chains across borders and carrying out vertical FDI (Schulz 2007). The electrical and transportation industries are also the ones where surveys reveal that Japanese firms are influenced by regional integration agreements, in particular by the ASEAN free trade area (JBIC 2004, 2005; JETRO 2003, 2004, 2005, 2006). Hence, there is slight support for hypothesis 4 on the positive effect of PTIAs for vertical FDI. However, interpretation in particular with regards to significance levels has to be done with caution due to the low sample sizes or few companies making up each industry.

F 1: Sectoral Tobit estimation: PTIA marginal effects



Note: Marginal Effects (e) of *WTO-PTIAs*: sectoral Tobit regressions (dots) and 95% Confidence Interval of the pooled random effects Tobit model in table T 2 column 1 (lines). For the individual tables (coefficients only) see T 12 and T 13 in the appendix. Dependent variable: General FDI. The explanatory variables are at the mean.

5.3. Robustness

Though Tobit allows for the inclusion of all developing countries as possible investment destinations of Japanese firms in the set-up, the major disadvantages of this methodology are that only a random effects set-up is possible and autocorrelation and

heteroscedasticity can only be rudimentarily be controlled for.

There is strong evidence for first order serial correlation in the data using linear testing schemes. The null hypothesis of no first order serial correlation using a test by Wooldridge on only the positive FDI data (Drucker 2003; Wooldridge 2002) is rejected at the 1% level with an *F-Value* of $F(1,543) = 206.814$.

For a random effects Tobit specification the only solution for adjusting the standard errors is using weighted-bootstrapped standard errors as a theoretical distribution of the test statistic is not known. It is quite robust and it often seems to perform better than analytically derived methods in small-samples also under non-normality (Cribari-Neto and Zarkos 1999). In the case of panel data, blocked bootstrapping occurs: clusters (industry-country groups) with replacement are drawn due to the correlation within a cluster. Since computation is too difficult in the whole industry-country panel, bootstrapping – as a robustness check - has only been carried out for single sectors – the electrical and wholesale industries. Significance levels decrease, but the hypotheses hold. See table T 14 in the appendix.

Furthermore, panel OLS estimation has been carried out to make results comparable to existing studies. The Breusch and Pagan Lagrangian multiplier test for random effects shows that a random effects specification is preferred ($\chi^2(1) = 23,786.90 [0.000]$), but a Hausman test rejects the random effects specification in favour of one with fixed effects which allows for the correlation of the unobserved effects with the error term ($\chi^2(22) = 153.08[0.000]$). To be able to better compare the results with the Tobit model, the random effects specification will, however, also be reported. Standard errors are adjusted for heteroscedasticity and also partially for autocorrelation in the data using the “robust” option in Stata which implements a weight-adjusted combination of the White and Newey-West estimator to handle both the heteroskedasticity and the autocorrelation in the model (Yaffee 2002). Only those country-industry pairs are included which have obtained Japanese investment– a total of 85 countries. The output is reported table 15 in the appendix. Results resemble, in particular with regard to BITs. However, the plurilateral trade and investment agreements are no longer significant. Nevertheless, one should remember that first of all, OLS is not the estimation method to use for non-

negative data – even if there is no pile-up at 0, and, furthermore, when omitting the 0-investment countries, important information is lost (Wooldridge 2002).

For the tobit random effects, several other model specifications were tested to check the robustness of the results. The baseline regressions were run for different samples - the sample of developing countries only and when omitting China – as China can be suspected to distort data as it attracts a very large part of Japanese investment. However, the omission of China did not, overall, change results (see table T 16 columns 3,4).

Moreover, additional variables were included. As an industry-level characteristic firm-size was entered into the regressions using the net sales measure (table T 16 Colum 1,2). Due to missing data for the service industries (real estate, financial and insurance as well as holding firms), the latter were omitted from this analysis. *Net sales* is, as expected, positive though only significant in the general FDI estimation and not for large-scale FDI. The coefficients and magnitudes of the effects for the other variables do not change. Also, further country level variables were added to control for inflation (*Log Inflation*) and the total FDI (in financial terms) inflows into a host country (*Log of Total FDI Inflows Host Country*) as recorded in their Balance of Payments (table T 16 Colum 6,7). The size of inflation (natural logarithmic transformation) in a host country indicates the level of macroeconomic instability. The figure of the total FDI inflows into a host country (natural logarithmic transformation) is of interest as it could be argued that the ratification of BITs by the Japanese government has simply been an answer to the high activism of investors of other nations in that country signaling higher locational attractiveness. Overall, inflation carries the expected negative sign, but is insignificant for both general and large-scale FDI. However, the general FDI inflow variable (*Log of Total FDI Inflows Host Country*) is highly significant and positive (1% significance level). In the case of the general FDI variable the BIT variable now turn insignificant – providing evidence for the fact that its impact is not quite robust. However, when regressing the large-scale FDI variable on the new set of variables, it is still at the 1% level significant and the economic impact also does not change strongly.

6. CONCLUSION

The paper analyses the impact of international trade and investment agreements on

foreign direct investment (FDI) in developing and emerging economies. It contributes to the existing literature by capturing differential impact of the agreements with regards to FDI and industry characteristics. According to transaction cost and institutional theory, the asset specificity of the investment and the degree to which sunk costs are involved in the FDI should be of relevance for explaining treaty effectiveness. Moreover, differential impact of the agreements is expected to occur for vertical and horizontal FDI.

Although a significant role of asset specificity – proxied by the industry averaged R&D specificity of the parent firms – for treaty effectiveness has not been confirmed, the importance of sunk costs captured through the size of the affiliates included in the FDI aggregation for BIT effectiveness has been supported. Furthermore, there is slight evidence that the preferential trade and investment agreements increase primarily vertical FDI. Overall, industry differences seem to matter: The poolability of coefficients across sectors is rejected.

Limits to the analysis are that only a random effects set-up is possible for a Tobit estimation which leads to the possible problem of correlation with the error terms. One also has to be aware of the possible endogeneity in the agreement conclusion which is not accounted for in the set-up of the empirical study: thus, the Japanese government might only have concluded the agreements in order to support its businesses: It can be expected that the Japanese government only concluded treaties assuming a rise in investment activities due to a certain pressure by its businesses through lobbying activities and the like. However, as a proxy, Japanese development aid was included as higher aid expenses can be understood as higher home government activism following these economic interests. Also, the overall FDI attractiveness of a country has been accounted for by including overall FDI inflows. Results remain robust. Finally, the study of agreement effectiveness leads to empirical challenges in general: Often, the formation of an agreement coincides with economic growth in general and overall multilateral liberalization. Most agreements have only been concluded in the 1990s and as such only have data for a few years. Moreover, transition years exist where changes are phased in with periods often extending up to 15 years (Krueger 1999).

In spite of these limits, results have proven to be quite robust and follow theoretic predictions. The work substantially extends existing literature by supporting the role of sunk cost and the motivation for carrying out FDI in explaining treaty effects. Further research should address possible endogeneity, e.g. by applying a dynamic panel framework, and refine the asset specificity variable using alternative measures.

7. APPENDIX

T 5: International Trade and Investment Agreements Japan (as of Jan 2008)

	Signature	Entry in to force	Status-quo
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)		
Laos			Negotiations since 12/ 2006
Saudi-Arabia			Under negotiation
Trilateral investment treaties			
China, Korea, Japan			Third round of discussion 11/2007
Economic Partnership Agreements (Preferential trade and investment agreements PTIA)			
Singapore	2002	2002	In 03/2007 signature of a Protocol amending the Agreement and entry into force in 01/2008
Mexico	2004	2005	In 09/2006 a Protocol to improve market access conditions was signed, entry into force 04/2007
Malaysia	2005	2006	
Philippines	2006		Ratified by the Japanese Diet 12/2006, not yet ratified by the Philippines
Chile	2007 (March)	2007 (Sept)	
Thailand	2007 (April)	2007 (Nov)	
Brunei	2007 (June)		
Indonesia	2007 (August)		
Korea			“Official negotiations” – negotiations have been halted since last round ended in November 2004 (launched December 2003)
ASEAN			11 th round of negotiation in November 2007 Agreement in principle was reached in August 2007
Gulf Cooperation Council			2 nd round of negotiations January 2007.
Vietnam			- 5 th meeting in October 2007. - First round of negotiations held in January 2007
India			4 th meeting September 2007 Negotiations started in January 2007
Switzerland			4 th round of negotiations December 2007
Australia			2 st round of negotiations September 2007.
ASEAN+3 (Japan, China, Korea), ASEAN 10+5 (Japan, China, Korea, Hong Kong, Taiwan) Comprehensive Economic Partnership in East Asia (CEPEA).(including ASEAN +China, South Korea, Japan, India, Australia, and New Zealand.			“Discussion.. in the future” Proposed in August 2006 (Bridges Weekly 2006).

Source: MOFA (2008, Jan)

T 6: Regional Trade and Investment Agreement Classification

Regional Agreement, Member Countries				Te Velde and Bezemer (2006)	
Date of Entry into Force used in the calculation for the two variables “Log Add. Reg.GDP” and “Membership RTIA “					
Name	Member countries	Tot, GDP (con. 2000 US\$)		Invest.(1)	Trade (2)
		Median	Mean		
Africa					
COMESA(Com mon Market for Eastern and Southern Africa) 2000	Angola, Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, and Zimbabwe	1.54 E+11	1.56E+11	1(1994)	1(1994)
SADC (Southern African Development Community) 1992	Angola, Botswana, the Democratic Republic of Congo (1997), Lesotho, Madagascar (2005), Malawi, Mauritius (1995), Mozambique, Namibia, South Africa (1994), Seychelles (1997-inc. 2003), Swaziland, United Republic of Tanzania, Zambia, Zimbabwe,	1.76E+11	1.60E+11	1(1992)	1(1992)
Latin America					
MERCOSUR (Southern Common Market) FTA 1995	Argentina, Brazil, Paraguay (1996), Uruguay (1996), [Venezuela (2006)]	8.94E+11	8.90E+11	2(1994)	3(1991)
ANDEAN FTA 1993	<i>Bolivia, Colombia, Ecuador, Peru (except 1992– 1997) and Venezuela [-incl. 2006],</i>	2.78E+11	2.58E+11	1(1987) 2(1991)	1(1987) 2(1993)
CARICOM 2001	Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti (2002-inc. 2003), Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago	3.09E+10	3.04E+10	1(1982) 2(1997)	2 (1982) 3 (1997)
NAFTA (North American Free Trade Agreement)	US, Canada, Mexico	1.06E+13	1.05E+13	3(1994)	2(1994)
Asia					
ASEAN: AFTA 1992	Brunei, Cambodia (1999), Indonesia, Laos (1997), Malaysia, Myanmar (1997), Philippines, Singapore, Thailand, Vietnam (1995),	5.51E+11	5.48E+11	1(1987) 2(1996) 3(1998)	1(1980)

Sources: Various & Te Velde and Bezemer (2006)

(1) Investment Index: 0 if not member of group; 1 if some investment provisions in region; 2 if advanced investment provisions in region; 3 if complete investment provisions in region; -1 if more restrictive provisions

(2) Trade Index: 0 if not member of group; 1 if some trade provisions (e.g. tariff preferences); 2 if low MFN tariffs, (close to) zero intra-reg tariffs; 3 if high MFN tariffs, (close to) zero intra-reg tariffs

T 7: Log. of Japanese Employment (at least 10% ownership) for selected country sample (1989-2004) per industry – statistics for positive/ Uncensored Sample

	Mean	Median	Max	Min.	Std. Dev.	No of Positive Obs. (Censored Observations per Industry)
Agriculture, forestry, and fisheries	4.71	4.90	8.32	1.16	1.71	293 (2219)
Ceramic, stone and clay products	6.31	6.89	9.04	0.69	1.68	242 (2270)
Chemical, Petroleum, Coal, Rubber and al	6.19	6.48	10.46	0.69	2.43	390 (2122)
Construction	4.60	4.73	8.26	0.69	2.17	418 (2094)
Electrical machinery, Equipment and Supp	7.05	7.06	12.32	0.84	2.84	458 (2054)
Fabricated metal products	6.70	7.01	9.55	1.33	1.56	196 (2316)
Finance and insurance	4.71	4.68	8.69	0.69	2.19	315 (2197)
Food, beverages, tobacco and prepared an	6.33	6.56	9.94	2.59	1.83	276 (2236)
General Machinery	6.38	7.04	10.58	0.69	2.23	299 (2213)
Iron and Steel	5.20	5.37	8.49	1.22	1.59	313 (2199)
Lumber and wood products and Pulp, paper	5.61	5.38	9.19	2.11	1.82	216 (2296)
Mining	5.03	5.58	7.62	1.61	1.34	148 (2364)
Miscellaneous industries	4.93	5.00	9.33	0.69	2.25	470 (2042)
Miscellaneous manufacturing industries	5.52	5.96	8.98	1.10	2.19	345 (2167)
Non-ferrous metals and products	6.48	6.83	9.31	2.60	1.74	254 (2258)
Precision instruments and machinery	7.21	7.47	10.17	2.77	1.53	203 (2309)
Printing and Allied Industry	5.41	5.76	7.78	0.69	1.64	123 (2389)
Real estate	3.95	3.79	7.00	0.69	1.59	174 (2338)
Stock holding and Controlling Companies	5.10	5.25	8.69	0.69	2.32	112 (2400)
Textile mill products and Apparel	6.66	6.84	11.04	2.13	1.97	346 (2166)
Transport, electricity, gas, heat supply	5.06	4.99	8.85	0.97	2.11	362 (2150)
Transportation Equipment	6.61	7.17	10.71	0.69	2.52	450 (2062)
Wholesale and retail trade	5.21	5.26	9.94	0.69	2.20	708 (1804)

Note: Only Non-Censored Observations are included in the summary statistics calculations

T 8: Descriptive Statistics – per Parent Firm (DBJ)

Averages across Listed Parent Firms (with available data) 1989-2003					
Industry	No of Listed Parent Firms	Mean R&D expenses over Net Sales	Median R&D expenses over Net Sales	Mean Net Sales (in thousand Yen)	Median Net Sales (in thousand Yen)
Agriculture, forestry, fisheries	2	0.010	0.010	2.42E+07	2.12E+07
Ceramic, stone, clay	47	0.021	0.018	1.08E+08	4.59E+07
Chemical, Petroleum, Coal, Rubber and allied products	158	0.051	0.041	1.71E+08	7.02E+07
Construction	82	0.003	0.003	3.09E+08	1.89E+08
Electrical	200	0.039	0.028	2.59E+08	4.74E+07
Fabricated metal products	43	0.018	0.012	7.26E+07	2.41E+07
Food, beverages, tobacco et al.	63	0.014	0.010	2.67E+08	1.54E+08
General machinery	151	0.026	0.020	1.39E+08	4.00E+07
Iron and steel	30	0.012	0.010	2.94E+08	9.15E+07
Lumber, wood, pulp, paper	23	0.010	0.006	1.22E+08	4.21E+07
Mining	5	0.011	0.010	5.15E+07	4.12E+07
Miscellaneous industries	113	0.033	0.009	6.15E+07	2.80E+07
Miscellaneous manufacturing	70	0.027	0.018	8.33E+07	4.30E+07
Non-ferrous metals & products	29	0.021	0.017	1.94E+08	1.15E+08
Precision inst. & machinery	41	0.041	0.035	6.74E+07	3.92E+07
Printing and allied Industry	10	0.013	0.011	3.48E+08	1.14E+08
Textile and apparel	45	0.023	0.014	8.91E+07	4.48E+07
Transport, electricity et al.	78	0.010	0.007	2.98E+08	6.95E+07
Transportation Equipment	111	0.023	0.015	3.86E+08	7.30E+07
Wholesale and retail trade	240	0.004	0.002	7.30E+08	1.05E+08
Finance and insurance	--	--	--	--	--
Real estate	--	--	--	--	--
Stock Holdings	--	--	--	--	--

Source: DBJ 2004

A 1: Tobit Model

The standard tobit model with random effects in a panel context has a joint density from the ij th panel and correspondingly panel level likelihood ℓ_{ij} of

$$f(y_{ij1}, \dots, y_{ijT} | x_{ij1}, \dots, x_{ijT}) = \int_0^{\infty} \frac{e^{-\lambda_{ij}^2 / 2\sigma_\lambda^2}}{\sqrt{2\pi\sigma_\lambda}} \left\{ \prod_{t=1}^T F(y_{ijt}, x_{ijt}\beta + \lambda_{ij}) \right\} d\lambda_{ij},$$

where

$$F(y_{ijt} | x_{ijt}\beta + \lambda_{ij}) = \begin{cases} \Phi\left(-\frac{(x_{ijt}\beta + \lambda_{ij})}{\sigma_u}\right) & \text{if } y_{ijt} = 0 \\ (\sqrt{2\pi}\sigma_u)^{-1} e^{-(y_{ijt} - (x_{ijt}\beta + \lambda_{ij}))^2 / (2\sigma_u^2)} & \text{if } y_{ijt} > 0 \end{cases},$$

Consistent estimates of the estimators and variances are obtained via parametric maximum likelihood techniques. This integral is approximated with the M-Point Gauss-Hermite quadrature as suggested by Butler and Moffit (1982).

To interpret the impact of the explanatory variables on the outcome of the dependent variable y , the partial derivatives of continuous variables for the expected value can be decomposed into two parts: the impact of an explanatory variable x 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 and Moffit 1980).⁹

$$\frac{\partial E y_{ijt} | X_{ijt}}{\partial x^k} = P(y_{ijt} > 0 | X_{ijt}) \left(\frac{\partial E(y_{ijt} | X_{ijt}, y_{ijt} > 0)}{\partial x^k} \right) + E(y_{ijt} | X_{ijt}, y_{ijt} > 0) \left(\frac{\partial P(y_{ijt} > 0 | X_{ijt})}{\partial x^k} \right),$$

⁹ For binary variables (e.g. entry into force of an agreement), the difference between the value when the variable takes on the value 1 and when it is 0 is taken.

$$\frac{\partial E[y_{ijt} | X_{ijt}]}{\partial x_k} = \Phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right) \cdot \beta_k \cdot \left[1 - \frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u} \cdot \frac{\phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right)}{\Phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right)} - \frac{\phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right)^2}{\Phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right)^2} \right] + \left\{ X_{ijt}\beta' + \lambda_{ij} + \sigma_u \cdot \frac{\phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right)}{\Phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right)} \right\} \cdot \frac{\beta'_k}{\sigma_u} \cdot \phi\left(\frac{X_{ijt}\beta' + \lambda_{ij}}{\sigma_u}\right)$$

Where $\phi(\cdot)$ is the standard normal density function and $\Phi(\cdot)$ the cumulative distributive function of the standard normal distribution.

Thus, when

$$z_{ijt} = \frac{(X_{ijt}\beta' + \lambda_{ij})}{\sigma_u} ,$$

then

$$\partial E(y_{ijt} / \partial x_{ijt}) = \Phi(z_{ijt})\beta_{ijt}$$

$$\partial E(y_{ijt} | y_{ijt} > 0) / \partial x_{ijt} = \beta_{ijt} \left(1 - z_{ijt} \phi(z_{ijt}) / \Phi(z_{ijt}) - \phi(z_{ijt})^2 / \Phi(z_{ijt})^2 \right),$$

$$\partial P(y_{ijt} > 0 / \partial x_{ijt}) = \phi(z_{ijt})\beta_{ijt} / \sigma$$

which refers to the marginal effects y, e, and p (measured at the mean of the explanatory variables) as shown in the estimation outputs.

T 9: Variables, Expected Impact, and Datasources

Variable	Definition	Expected Impact	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
Log GDP	The natural logarithm of the Gross Domestic Product - in constant prices for the year 2000 in US Dollar	+ (market seeking)	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 for the year 2000 values	- (labour-seeking)	WDI 2007
Trade openness	(Exports plus imports in US Dollar for the year 2000)/ GDP measured in constant US Dollar for the year 2000	+/-	WDI 2007
POLCON	The political constraints index (POLCON) measures the political institutional stability of an economy – “the extent to which a change in the preferences of any one actor may lead to a change in government policy” (Witold J. Henisz 2002): It is assumed that the more constraints there are, the more difficult it becomes to change policies making the business environment more predictable for the firm. It ranges from 0-1 – the higher the value, the less feasible is policy change.	+	Henisz (2002)
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
WTO-PTIAs	A dummy variable which captures membership (year of entry-into force) for country i in year t in at least one trade (and investment) agreement as notified to the WTO and all the following years	+	WTO (2006)
Membership RTIA	Dummy for membership in at least one of the selected regional trade (and investment) agreement and all the following years (see table T 6).	+	Te Velde and Bezemer (2006) and official various sources
Log Add. Reg.GDP	The natural logarithm of the sum of the total GDP of the RTIA partner countries (own GDP is not included) in the years a country is member to the respective selected regional trade (and investment) agreement	+	Te Velde and Bezemer (2006) and World Bank and official various sources
Trade Index	Index of Trade Liberalization which takes a value from 0-3 depending on the degree of trade liberalization prevailing in one of the respective RTIAs in which a country is a member.	+	Te Velde and Bezemer (2006)
Invest. Index)	Index of Investment Liberalization which takes a value from 0-3 depending on the degree of trade liberalization prevailing in one of the respective RTIAs in which a country is a member.	+	Te Velde and Bezemer (2006)
Log Japanese ODA	Natural log of positive values of total Overseas Development Assistance provided by Japan. Negative values are replaced by 0. 0 values are inserted for those countries where no values for Japan are reported while other donors have provided aid.	+	OECD Development Statistics
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 following years.	+	WTO
R&D Ind. Mean (R&D Ind. Mean >=1999)	Research and Development expenses over Net Sales of listed parent firms; Research and Development expenses over Net Sales of listed parent firms for the years after 1999	+	DBJ
Net Sales	As obtained from the company's financial statements and reported in the database	+	DBJ

WDI= World Development Indicators

DBJ= Development Bank of Japan

T 10: 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 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

T 11: Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum
<i>Dependent Variable</i>				
Log Employment (General)	0.81	2.19	0	12.323
Log Employment (Large Scale)	0.61	2.02	0	12.3
<i>Country Level</i>				
Log GDP	22.866	1.943	17.452	28.074
Similarity	0.0626	0.926	0.0022	0.654
Log Distance	9.180	0.4815	7.055	9.830
Trade Openness	81.03	49.35	13.244	398.799
POLCON	0.358	0.311	0	0.8904
BIT	0.0384	0.192	0	1
WTO-PTIA Notification	0.532	0.499	0	1
Membership in Selected RTIAs	0.2	0.4	0	1
Log Japanese ODA	13.57	6.32	0	21.027
Trade Restr.	0.46	0.81	0	3
Inv. Index	0.45	0.77	0	3
Log. Inflation	2.34	1.48	-4.6	10.19
Log of Tot. FDI Inflows Host Country	17.28	5.29	0	24.6
WTO-Member	0.677	0.468	0	1
<i>Industry Level</i>				
Log Net Sales	18.940	0.83	16.735	21.12
R&D Ind. Mean	0.02	0.01	0	0.06
R&D Ind. Mean >=1999	0.01	0.02	0	0.06

Notes: The descriptive statistics are from the regressions Table T 2 column 1- if the variables were used in this context. Otherwise, they stem from the regressions presented in the relevant outputs.

T 12: Individual Sector Estimations Industry 1-12

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Agriculture etc.	Mining	Textile etc.	Lumber, wood, paper	Printing etc.	Chemical, Petroleum, Rubber etc.	Ceramic etc.	Iron and Steel	Non-ferrous metals	Fabricated metals	General Machinery	Electrics etc.
Log GDP	3.443*** (0.871)	3.878*** (1.292)	3.598*** (0.486)	4.702*** (0.724)	8.222*** (1.975)	3.131*** (0.358)	6.179*** (0.883)	2.907*** (0.488)	3.703*** (0.551)	3.551*** (0.687)	4.003*** (0.479)	4.742*** (0.582)
Similarity	-16.37*** (6.083)	-36.64*** (13.31)	9.345** (4.131)	-18.48*** (5.168)	-23.12*** (4.407)	-6.590** (3.337)	-5.280 (4.458)	-7.621* (3.983)	-8.326** (3.768)	-9.796** (4.080)	-6.817* (3.994)	-6.092 (4.875)
POLCON	1.165 (0.859)	3.153** (1.408)	0.632 (0.549)	0.210 (0.754)	2.661*** (0.847)	0.0264 (0.500)	1.354 (0.844)	-0.965 (0.683)	-1.382** (0.678)	0.160 (0.810)	1.200* (0.683)	2.087*** (0.714)
Log Distance	-1.420 (1.754)	-2.561 (1.872)	-2.385 (1.579)	-6.728*** (1.868)	-7.335*** (2.064)	-4.074*** (0.964)	-6.569*** (1.791)	-3.226*** (1.205)	-5.342*** (1.291)	-6.327*** (1.225)	-2.916*** (1.112)	-2.000 (1.459)
Trade Openness	0.0190** (0.00931)	-0.0369** (0.0168)	0.00531 (0.00661)	0.0108 (0.00828)	0.0693*** (0.00861)	0.00466 (0.00538)	0.0240*** (0.00803)	0.0304*** (0.00686)	0.0152** (0.00696)	0.0278*** (0.00829)	0.0130* (0.00679)	0.0421*** (0.00785)
Japanese BITs, in force	0.273 (0.781)	-5.104 (3.758)	2.433*** (0.791)	1.495** (0.715)	2.994*** (0.869)	-0.0142 (0.412)	2.252*** (0.871)	0.893 (0.834)	0.0408 (0.725)	-1.038 (0.631)	0.236 (0.681)	3.381*** (0.699)
WTO-PTIA notification	0.212 (0.465)	2.519*** (0.661)	0.838*** (0.315)	0.650 (0.456)	1.312** (0.538)	0.146 (0.262)	0.884** (0.396)	-0.681** (0.342)	0.722** (0.352)	0.419 (0.457)	1.364*** (0.353)	1.868*** (0.377)
WTO- Membership	0.510 (0.579)	1.638 (0.998)	0.732 (0.457)	-1.610*** (0.562)	-1.806*** (0.660)	-0.229 (0.403)	-0.655 (0.551)	0.718 (0.463)	0.619 (0.459)	-0.603 (0.657)	-0.687 (0.540)	-0.270 (0.610)
Log Japanese ODA	0.00941 (0.0312)	-0.0880** (0.0415)	0.0979*** (0.0213)	0.0669** (0.0262)	0.0266 (0.0219)	0.0238 (0.0171)	0.0836*** (0.0244)	0.0491** (0.0209)	0.0577*** (0.0205)	-0.00658 (0.0253)	0.0559** (0.0225)	0.00128 (0.0242)
Constant	-76.88** (30.96)	-76.10** (35.15)	-73.21*** (19.79)	-64.02** (25.43)	-154.9*** (54.21)	-40.65*** (13.26)	-102.9*** (26.87)	-48.02*** (16.38)	-49.04*** (17.29)	-36.70* (20.05)	-75.82*** (16.71)	-101.7*** (22.14)
Obs.:Countries Uncensored	1829; 135 232	1829; 135 137	1829; 135 312	1829; 135 194	1829; 135 117	1829; 135 359	1829; 135 220	1829; 135 287	1829; 135 239	1829; 135 185	1829; 135 283	1829; 135 426
$\sigma_{\epsilon} ; \sigma_u$	7.290; 2.158	6.995; 2.255	8.789; 1.602	9.715; 1.532	7.208; 1.061	3.899; 1.438	8.392; 1.580	5.361; 1.661	6.133; 1.400	4.047; 1.636	4.188; 1.673	6.233; 2.236
Log-Likelih.	-684.3	-415.2	-776.8	-457.0	-231.7	-817.6	-533.0	-714.7	-548.4	-447.2	-695.0	-1182
Mc Fadden R2	0.32	0.32	0.41	0.44	0.36	0.28	0.30	0.33	0.38	0.23	0.22	0.26

Results are tobit estimates. A group is defined as a country over time. Standard errors are given in parenthesis. Only coefficients are reported. See also notes table T 2

T 13: Individual Sector Estimations Industry 13-23

	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
	Transportation	Precision industry	Misc. Manufacturing	Food etc.	Construction	Wholesale & Retail	Finance and insurance	Real estate	Utilities	Misc. industries	Holdings
Log GDP	3.930*** (0.424)	5.499*** (0.778)	3.263*** (0.564)	4.534*** (0.729)	2.664*** (0.331)	2.564*** (0.234)	2.393*** (0.387)	3.537*** (0.645)	2.634*** (0.378)	2.213*** (0.285)	3.248*** (0.654)
Similarity	-15.42*** (4.293)	-14.78*** (3.292)	-0.585 (4.271)	-9.988** (4.258)	-7.115** (3.254)	-3.711 (2.924)	1.521 (3.621)	-5.541* (3.288)	-17.66*** (3.876)	-0.793 (3.326)	-9.455 (6.154)
POLCON	-0.0884 (0.601)	-0.191 (0.544)	1.488** (0.688)	0.928 (0.735)	-0.258 (0.473)	1.228*** (0.374)	1.199** (0.558)	-0.307 (0.598)	0.855* (0.490)	0.576 (0.498)	0.0139 (1.452)
Log Distance	-3.563*** (1.136)	-7.664*** (1.904)	-2.028 (1.302)	-4.261*** (1.383)	-1.912** (0.897)	-0.887 (0.739)	-2.500*** (0.945)	-2.858*** (1.022)	-5.403*** (1.209)	-4.953*** (0.843)	-0.783 (1.472)
Trade Openness	0.0299*** (0.00681)	0.0223*** (0.00568)	0.0266*** (0.00674)	0.0302*** (0.00791)	0.0150*** (0.00518)	0.0142*** (0.00394)	-0.000775 (0.00614)	0.0266*** (0.00625)	0.000341 (0.00484)	0.00763 (0.00494)	0.0427*** (0.0124)
Japanese BITs, in force	0.107 (0.609)	0.876 (0.542)	3.370*** (0.598)	1.149* (0.628)	0.383 (0.495)	1.279*** (0.434)	0.739 (0.530)	0.249 (0.488)	-0.421 (0.464)	-0.437 (0.489)	-0.304 (1.456)
WTO-PTIA notification	1.171*** (0.337)	0.921*** (0.271)	0.379 (0.339)	0.719* (0.402)	-0.130 (0.254)	0.0459 (0.206)	-0.139 (0.310)	0.905** (0.405)	0.392 (0.276)	0.201 (0.270)	0.132 (0.823)
WTO-Membership	-0.330 (0.568)	-0.283 (0.349)	-1.741*** (0.443)	0.950 (0.599)	-0.200 (0.349)	-0.117 (0.257)	0.285 (0.438)	-0.326 (0.586)	0.0709 (0.361)	0.00559 (0.358)	4.270*** (1.178)
Log Japanese ODA	0.0183 (0.0213)	0.0351** (0.0148)	0.0835*** (0.0222)	0.0127 (0.0234)	0.0444*** (0.0168)	0.0452*** (0.0140)	0.0894*** (0.0219)	0.0417** (0.0209)	0.0391** (0.0178)	0.0263 (0.0182)	0.0291 (0.0432)
Constant	-65.98*** (15.63)	-74.44*** (20.79)	-66.93*** (20.00)	-80.21*** (22.18)	-49.58*** (12.56)	-54.85*** (9.513)	-39.57*** (14.12)	-67.81*** (18.47)	-21.07 (13.11)	-11.91 (10.28)	-88.46*** (23.24)
Obs; Countries	1829; 135	1829; 135	1829; 135	1829; 135	1829; 135	1829; 135	1829; 135	1829; 135	1829; 135	1829; 135	1829; 135
Uncensored	417	188	310	243	367	635	282	149	330	391	107
$\sigma_\lambda; \sigma_u$	5.059; 2.006	6.307; 0.883	5.690; 1.771	5.808; 1.661	3.972; 1.470	3.581; 1.512	3.908; 1.666	3.760; 1.183	6.562; 1.398	3.735; 1.663	4.610; 2.456
Log-Likelih.	-1106	-306.8	-806.0	-589.1	-887.4	-1472	-747.7	-314.3	-773.2	-997.8	-342.2
Mc Fadden R2	0.26	0.44	0.29	0.30	0.30	0.28	0.21	0.32	0.34	0.26	0.15

Results are tobit estimates. A group is defined as a country over time. Standard errors are given in parenthesis. Only coefficients are reported. See also notes table T 2.

T 14: Sector Regressions: Electrical and wholesale & retail industries with bootstrapped errors

	Electrical industry					Wholesale industry				
	Boot Gen. FDI	ME (e)	Boot Large FDI	St. Err Large FDI	ME (e)	BootG en. FDI	ME (e)	Boot Large FDI	St. Err Large FDI	ME (e)
Jap. BITs	2.746 (1.784)	0.528	4.978* (2.568)	4.978*** (1.180)	0.708	1.076* (0.600)	0.338	3.102 (6.231)	3.102** (1.445)	0.491
WTO-PTIAs	1.127** (0.557)	0.192	2.332*** (0.673)	2.332*** (0.513)	0.276	-0.113 (0.381)	-0.03	-0.381 (0.694)	-0.381 (0.528)	-0.053
Log GDP	3.58*** (0.622)	0.61 0.103	5.748*** (1.009)	5.748*** (0.766)	0.68	2.409*** (0.282)	0.65	3.756*** (0.727)	3.756*** (0.517)	0.52
Similarity	-2.538 (9.067)	-0.43	-13.18 (8.873)	-13.18** (5.870)	-1.57	-3.365 (3.622)	-0.91	-3.599 (10.14)	-3.599 (5.823)	-0.50
POLCON	1.528 (0.983)	0.26	3.536** (1.659)	3.536*** (1.146)	0.42	1.103 (1.004)	0.30	2.658 (2.052)	2.658** (1.151)	0.37
Log Distance	-2.835** (1.198)	-0.48	-2.983 (1.962)	-2.983* (1.742)	-0.35	-1.024 (0.791)	-0.28	-1.176 (1.520)	-1.176 (1.343)	-0.16
Trade Open.	0.031** (0.0151)	0.005	0.0692*** (0.0241)	0.0692*** (0.0106)	0.008	0.0119* (0.0066)	0.003	0.0328** (0.0155)	0.033*** (0.0101)	0.005
WTO-Member	-0.822 (0.596)	0.142	-0.582 (1.235)	-0.582 (0.757)	-0.070	-0.265 (0.461)	0.072	-0.683 (1.431)	-0.683 (0.729)	-0.096
Log Net Sales			10.52*** (2.338)	10.52*** (2.091)	1.25					
Log Jap.ODA	0.0123 (0.0354)	0.002	0.0254 (0.0470)	0.0254 (0.0295)	0.003	0.0479* (0.0265)	0.01	0.0895 (0.0572)	0.0895** (0.0364)	0.01
Constant	-66.7*** (21.38)		-327.3*** (69.47)	-327.3*** (57.58)		-50.17*** (11.34)		-89.1*** (24.71)	-89.1*** (19.69)	
Observations No. of countries	1822 135		1822 135	1822 135		1822 135		1822 135	1822 135	
Log Likelihood	-1185		-881.4	-881.4		-1466		-952.4	-952.4	
σ_λ	5.777		6.791	6.791		3.603		5.391	5.391	
σ_u	2.315		2.486	2.486		1.524		3.084	3.084	

Results are tobit estimates. The dependent variable Y_{it} 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 a country over time. Bootstrapped and Standard errors are given in parenthesis. The marginal effects e are reported in the second column of each regression (for detailed explication see section 4.1).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.

T 15: Panel LS – Industry-Country Panel: No Zeros

	(1)	(2)	(3)	(4)
	All Countries Fixed Effects	Random Effects	Only Dev.ing Countries Fixed Effects	Random Effects
Log GDP	2.319*** (0.154)	0.905*** (0.0522)	2.940*** (0.193)	0.939*** (0.0566)
Similarity	-9.283*** (0.563)	-4.910*** (0.387)	-26.02*** (2.964)	-7.838*** (1.584)
POLCON	0.202*** (0.0747)	0.180** (0.0720)	0.377*** (0.0820)	0.265*** (0.0802)
Log Distance	0 (0)	-0.762*** (0.116)	0 (0)	-0.584*** (0.170)
Trade Openness	0.00494*** (0.000857)	0.00854*** (0.000712)	0.00662*** (0.00111)	0.00871*** (0.000982)
Jap. BITs	0.484*** (0.0827)	0.362*** (0.0780)	0.450*** (0.128)	0.288** (0.114)
WTO-PTIAs	-0.00683 (0.0416)	0.0230 (0.0407)	0.0123 (0.0487)	-0.0147 (0.0482)
WTO-Member	-0.0859 (0.0594)	0.0471 (0.0579)	-0.136** (0.0639)	0.0565 (0.0637)
Log Jap. ODA	0.00469** (0.00214)	0.0100*** (0.00216)	-0.000397 (0.00308)	0.00902*** (0.00314)
Constant	-51.74*** (3.802)	-11.19*** (1.909)	-66.64*** (4.692)	-13.55*** (2.397)
Observations	6410	6410	5040	5040
Cou.-Ind. Pairs	602	602	502	502
R-Squared Within	0.151	0.123	0.181	0.145
R-Squared Overall	0.110	0.247	0.187	0.270
R-Squared Between	0.131	0.264	0.204	0.275
Chi-Squared		974.0		957.1
F Statistic	29.23		30.64	
Sigma	3.353	1.930	3.967	1.892
Sigma e	0.707	0.707	0.740	0.740

Results reported in this table have been obtained using a random or fixed least squares estimation. The dependent variable Y_{it} is the natural logarithm of the share of employment to be attributed to the Japanese owners (total employment* investment share of Japanese owners within the company). All explanatory variables are lagged by one year. Serial correlation and heteroscedasticity is controlled for within each group using the robust standard errors. A group is defined as an industry in a country over time. Robust 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. *, **, *** indicates significance at the 10%, 5%, and 1% level, respectively

T 16: Robust Checks Tobit Industry-Country Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
	Without Services		Developing countries China	without		Developing countries	Additional Regressors	
	General FDI	Large FDI	General FDI	Large FDI	General FDI	General FDI	Large FDI	Scale
Log GDP	3.203*** (0.124)	4.314*** (0.137)	3.467*** (0.189)	5.941*** (0.222)	3.500*** (0.184)	3.406*** (0.145)	5.259*** (0.242)	
Similarity	-7.169*** (0.967)	-13.22*** (1.465)	-12.48*** (2.830)	-34.25*** (5.296)	-9.970*** (2.973)	-7.944*** (1.193)	-15.94*** (1.986)	
POLCON	0.582*** (0.146)	1.301*** (0.251)	0.899*** (0.181)	2.054*** (0.332)	0.883*** (0.177)	0.783*** (0.169)	1.663*** (0.306)	
Log Distance	-3.932*** (0.307)	-5.147*** (0.361)	-3.893*** (0.451)	-5.906*** (0.691)	-3.451*** (0.444)	-3.274*** (0.355)	-4.413*** (0.551)	
Trade Openness	0.0172*** (0.00154)	0.0299*** (0.00273)	0.0158*** (0.00200)	0.0324*** (0.00365)	0.0170*** (0.00195)	0.0190*** (0.00179)	0.0368*** (0.00315)	
Jap. BITs, in force	0.824*** (0.146)	2.224*** (0.251)	0.477** (0.205)	2.138*** (0.411)	0.443** (0.203)	0.216 (0.176)	1.368*** (0.331)	
WTO-PTIAs	0.644*** (0.0802)	0.555*** (0.136)	0.765*** (0.0999)	0.767*** (0.182)		0.714*** (0.0874)	0.566*** (0.154)	
Log Add. Reg. GDP					0.0124*** (0.00385)			
WTO-Member	-0.134 (0.111)	-0.427** (0.181)	-0.0528 (0.148)	-0.170 (0.275)	-0.157 (0.134)	-0.167 (0.126)	-0.202 (0.215)	
Log Japanese ODA	0.0398*** (0.00506)	0.0529*** (0.00832)	0.0575*** (0.00692)	0.0531*** (0.0122)	0.0540*** (0.00682)	0.0442*** (0.00569)	0.0501*** (0.00960)	
Log Net Sales	0.336*** (0.114)	0.0257 (0.178)						
Log Total FDI Inflows Host Country						0.0230*** (0.00643)	0.0326*** (0.0105)	
Log Inflation						-0.00276 (0.0264)	-0.0524 (0.0456)	
Constant	-54.83*** (4.701)	-71.60*** (5.780)	-56.62*** (5.519)	-106.3*** (8.574)	-61.53*** (6.063)	-61.09*** (4.892)	-103.8*** (7.433)	
Observations	38409	38409	42775	42775	43150	39425	39425	
Cou.-Ind. Pairs	2835	2835	3175	3175	3200	3175	3175	
Uncensored	6021	3813	4700	2707	5040	5374	3267	
Sigma u	6.147	8.473	7.000	10.78	7.032	6.804	9.702	
Sigma e	1.807	2.408	2.090	2.795	2.036	1.924	2.566	
Chi-Squared	1386	1708	778.0	1169	874.1	1147	1007	
Log-Likelih.	-15686	-11271	-13552	-8773	-14246	-14746	-10089	
ML Cox Smell		0.29		0.17	0.31	0.3	0.23	
Mc Fadden Pseudo R2	0.34	0.33	0.35	0.33	0.35	0.35	0.33	

Results are tobit estimates. The dependent variable Y_{it} 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.

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