First Draft

Distance on FDI and Trade:

The Roles of China and Mexico in the Pacific Basin*

Mar 2005

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* The earlier version of this paper was circulated under the title "How does China compete with Japan in the US Market?: A triangular trade approach." This research was conducted in part while Yushi Yoshida was a visiting research associate at the University of California, Santa Cruz and Hiro Ito was at UCSC. We would like to thank Eiji Fujii, participants of APEC Study Center Conference at City University of Hong Kong, Japan Economic Association Conference at Meiji Gakuin University, "WTO, China and the Asian Economies" Conference at Renmin University of China, and the 6th ETSG Conference at University of Nottingham.
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[Abstract]

In this study, we investigate the dynamics of the trilateral trade relationship among the U.S., Japan and an emerging economy in the Pacific Basin. Our particular attention is paid to two emerging countries; China and Mexico. In what we call the "triangular trade approach," we explore how Japanese trade with and foreign direct investment to an emerging economy affect its exports to the US market. We apply the trilateral trade approach to eight Southeast Asian countries, four American continent countries and four European countries. Our empirical results suggest that the exports of China and Mexico are directly competing with those of Japan in US markets while the exports of China and Mexico to the US also appears to be promoted partly by Japanese exports to these countries. However, after controlling for Japan's FDI to these countries, the trade enhancing effect of Japanese exports disappears for China, leading us to conclude that Japanese exports to China are positively correlated with Chinese exports to the US through an increase in vertical trade between Japanese multinationals and their affiliates in China. Our results indicate important distinction about two distances: proximity to home country and proximity to market.

Key Words: China, Distance, Foreign Direct Investment, FTA, Japan, Trade, Mexico, Triangular Trade Approach.
JEL Classification: F14, F23

1. Introduction

The Pacific Basin contains two regions of emerging economies, namely, Southeast Asian countries and Latin American countries. From the perspective of development economics, researchers can easily find many features making these two regions distinct from each other. Variety of languages are much more broad in Southeast Asia, the size of land is enormous for Latin American countries whereas population is much more dense in Southeast Asian countries and differences can be found in education levels, natural resources endowments, income per capita and so on.

In an era of regional trade agreements (RTAs) and free trade agreements (FTAs) in bilateral and multilateral relationships, however, the most important feature of these regions might be the geographical location of regions with respect to two largest economies of the world, the U.S. and Japan. While both the U.S. and Japan are the biggest producers of the world, coupled with its huge external imbalance, the U.S. is definitely the largest market in the world.

In search for a location of overseas production, two options can be available; a location closer to home country or a location closer to a targeted market. From the perspective of Japanese multinationals, establishing a subsidiary plant in the Southeast Asia reduce transportation cost for shipments of intermediate products between a parent firm and subsidiaries while a plant in the Latin America can cut transportation costs between subsidiaries and final consumers in the U.S.[1]

From the wake of North American Free Trade Agreement (NAFTA), Mexico-US trade has expanded and brought down transportation cost for crossing national borders

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[1] Reduction in cost is not limited to transportation cost. For example, shortening of communication and shipment time can also save possible missed opportunities. However, again, there is a trade-off between proximity to home and proximity to market.

of these countries, see the arguments in Hanson (2001). One extreme case of minimizing distance between subsidiary and final market is to establish a local plant in a country of final market, i.e., the U.S. in this case. However, coupled with lower wages of Mexican labor force, diminishing transportation cost between Mexico and the U.S. is appealing.

In this study our focus is to investigate the dynamics of exports for emerging economies in the Pacific Basin with respect to the U.S. market. Particularly, we investigate how Japanese exports and foreign direct investments (FDIs) to emerging economies of two regions affect exports of emerging economies to the U.S. With ongoing expansion of outsourcing and fragmentation of vertical production in international settings, export platform FDIs by Japanese multinationals surely boost trade volume of emerging economies. Aside from FDIs' direct effect, an export of Japanese products to emerging economies can itself promote an export of emerging economies when spillover technologies and competitive pressure for import substitute industries are considered. In addition to Japanese exports and FDIs with respect to emerging economies, we also include Japanese direct export to the U.S. to control for production shift effect and substitution effect[2].

In our sample we compare eight Asian countries with four American Continent countries and also include four European countries for robustness check, besides the US and Japan. For the reminder of the paper, we sometimes refer a country other than the US and Japan as a "third-country" for convenience. With the trade data disaggregated at the HS 4-digit level, the exports of a third country to the US are regressed on the Japanese exports to the US as well as those to the third (exporting)

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[2] These frameworks are called 'Triangular Trade Approach" in Ito and Yoshida (2005). Through descriptions of these effects are provided in section 3.

country in a panel data specification while controlling for other macro economic variables. With this model specification, the dynamics of the triangular trade relationships among the US, Japan, and a third country can be examined. More specifically, it can be revealed whether Japanese exports to the U.S. are in a substitute (competitive) or complementary relationship with those of a third country, while the former case possibly signifying Japanese multinational corporations' shift in their production bases.

One contribution of our paper in empirical international trade literature is that we attempt to estimate bilateral trade in a three-country framework whereas most of empirical works on international trade considers bilateral trade in a two-country framework. Empirical studies of bilateral trades using a gravity model framework implicitly ignore a possibly significant source of trade determinants, namely a third country. In addition our framework can shed a new light to the role of 'distance' in international trade. Distance is used as a measure for trade cost between an exporting country and an importing country in gravity model. Distance in our framework can take two measures; distance from Japan and distance from US. Whereas distance from US measures proximity to the market, distance from Japan can be interpreted as proximity to a competing country or proximity of production plants in a vertical relation.

The main empirical results are as follows: First, we obtained the empirical results that export of Japan to China is promoting Chinese exports to the US. However, after controlling for FDI, trade enhancing effect of Japanese export to China disappears. This result strongly supports the view that Japanese export to China is promoting Chinese exports to US due to the shift of production plants to China. Second, in contrast to China, both Japanese export to Mexico and FDI are significantly positive for Mexican export to US. Japanese export to Mexico has some enhancement effect on

Mexican export to US in addition to Japanese-FDI related exports. Moreover, we also found that Japanese FDI to other countries are not promoting export of that country to US.

Third, after controlling for US market size for each commodity, we confirmed that exports of many countries are in competition with Japanese exports. But, the magnitude of coefficients remained much higher for China and Mexico. Fourth, we found that the impact of Japanese trade on third country's export to US is larger for Asian countries. It is also true in general that coefficients are larger for countries in American Continent than those in Europe. These evidences combined may seem to suggest that proximity of third-country either to competing country or to destination country is the major factor for determining the degree of impact. Fifth, with the use of macroeconomic variables in triangular trade framework, the results we obtained indicate that the intensity of trade between a third-country and the US is also a key determinant for the degree of impact of Japanese trade.

The rest of the paper is organized as follows. The next section reviews recent economic backgrounds for two distinguishing emerging countries in the Pasific Basin, namely China and Mexico. Section 3 reviews previous studies in the literature and gives theoretical backgrounds for our framework of a triangular trade approach. In section 4 we describe our data set. Section 5 discusses our preliminary estimation results with macroeconomic variables. These preliminary investigations suggest that we need to construct more disaggregated data comparable to trade data classification. Section 6 discusses the estimation results with more disaggregate explanatory data, namely foreign direct investment at industry level and US total import at commodity level. Section 7 presents conclusions.

2. A Tale of Two Emerging Countries: China and Mexico

a. China

The expansion of international trade for China in last twenty years has been at most rapid speed as China has maintained high growth rate of economy for the same period. Specifically, export of China has almost tripled from 84.9 billion US dollars in 1992 to 249 billion US dollars in 2000. Import of China has also grown from 80.6 billion US dollars in 1992 to 225 billion US dollars in 2000. With the accession to the WTO in 2001, China's trade is expected to experience even higher growth rate in years to come.

However, China's significant presence in world trade has also given rise to new trade disputes with trading partner countries. With accusation for sluggish response to open up domestic markets for foreign corporations, China is also condemned for its pervasive violations of intellectual property rights of computer software. A recent active debate between Alan Greenspan, chairman of the Federal Reserve Board and Congress on restriction for textile imports from China signifies the political concerns over loss of manufacturing jobs in US industries competing directly with Chinese manufacturers[3]. Other manufacturing products under debate are bedroom furniture, television sets, handbags and handcarts.

These disputes are clearly reminiscent of decade-old Japan-US trade conflicts. Whereas there was intense debate in both academics and business world on foreign access to domestic market in Japan[4], Japanese exporters in textile, automobile and

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[3] See the following articles in New York Times; US moves to limit textile imports from China, Nov 19, 2003, and Greenspan warns Congress not to create trade barriers, Mar 12, 2004.

[4] For example, papers in Krugman (1991) discuss the openness of Japanese domestic market. Whereas Lawrence (1991) argues "keiretsu" is one of sources of trade barriers in Japan, Saxonhouse (1993) takes a view that Japan is not any different from other

semiconductor industries were put under allegations of unfair trade by US competitors. However, the magnitude of importance in US-Japan trade debate has gradually declined in last ten years, partly due to the emergence of new trade conflicts with China. For example, the number of trade dispute against Japan brought to the WTO is only one in five years of sample from 1999 to 2003.

Generally speaking, political conflicts between trading countries could change their forms with ever-increasing flows of foreign direct investment. A decrease in the exports of a country might merely be a reflection of a global production shift by the country's multinational corporations. Particularly, US-Japan trade conflicts might be diminishing on surface partly due to the fact that significant part of Japanese exports has changed its country label from 'made in Japan' to 'made in China.' The number of cases for new Japanese foreign direct investment outflow to China, reported to the Ministry of Finance, exceeds Japanese FDI outflow to US in 1994, 1995 and 2002.

Moreover, the US and Japan are the most important countries as trading partner besides Hong Kong. In 1992 Hong Kong was the China's trading partner with the most traded values in both exports and imports. However, this is due to Hong Kong' s role as a middleman between China and the world as China moved toward a more decentralized economy[5]. Assuming indirect trade flows via Hong Kong of China are proportional to direct trade flows of China, the US and Japan has been two largest trading partners for both exports and imports during the last decade. China's imports from Japan had tripled from 13.7 million dollars in 1992 to 41.5 million dollars in 2000 and imports from the US had more than doubled from 8.9 million dollars in 1992 to 22.4

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industrial countries.

[5] See Fung and Iizaka (1998) for a detailed description of Hong Kong's role as a re-exporter of US and Japanese exports.

million dollars in 2000, see Table 1. While China's exports to Japan has dramatically increased almost four-folds from 11.7 million dollars in 1992 to 41.6 million dollars in 2000, China's exports to the US even surpassed growth of exports to Japan, jumping six-folds, from 8.6 million dollars in 1992 to 52.1 million dollars in 2000, see Table 2.

b. Mexico

Mexican trade with adjacent countries has expanded significantly especially since North American Free Trade Agreement (NAFTA) became effective in 1994. Mexico has experienced most dramatic changes in trade and investment policies even before signing free trade agreement with two North American countries. Unilateral trade liberalization and domestic reform in Mexico brought down average tariff rate from 26% in 1985 to 12.5% in 1990, see Grether et al. (2001).

Table 4 presents major trading partners for Mexico between 1992 and 2000. The U.S. has been singularly the largest trading partners throughout this period for both imports and exports. The share of the U.S. in Mexican imports is 73.7% and 80.6% in Mexican exports in 1992. The U.S. share in both exports and imports even soared after NAFTA became effective in 1994. While lagging far from the U.S., Japan is one of the next largest exporters among Canada, France and Germany. We can observe the importance of Canada, Mexico's another partner in NAFTA, also increased after 1994.

Table 5 depicts Japanese FDIs, in terms of both values and cases, to selected Latin American countries from 1989 to 2002. While Brazil usually receives the largest value of Japanese FDI in the region, Mexico received the largest value in two years[6].

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[6] Of course the largest Japanese FDIs in Americas are directed to tax-haven territories such as Cayman Islands or Virgin Islands, however these FDIs are in financial sectors.

We can observe Japanese multinationals target Mexico as an important host country for FDI. The size of FDI in Mexico appears smaller in both values and cases in comparison with Asian countries, however 65 billion yen investment from Japan in 1994 surpasses Japanese FDI for Korea. In 1999 the value of 165 billion yen for FDI in Mexico is larger than any countries in the Asia.

{More to be inserted}

3. A Triangular Trade Approach and Related Literature

3-1. FDI and Trade in a Three-Country Framework: Intra-firm Trade

When considering to sell products in a foreign market, a multinational firm can choose whether it exports the products directly from its home country, or produces them in the foreign market through its foreign subsidiaries. In the empirical trade literature, many researchers have attempted to answer the question of whether foreign production (i.e., FDI) and exports are substitutes or complements.[7] Yamawaki (1991), Clausing (2000), and Head and Ries (2001) find that a complimentary relationship exists between foreign production and exports, whereas Belderbos and Sleuwaegen (1998) find that Japanese FDI and exports are substitutes only when the intention of FDI is to avoid antidumping tariffs in Europe. Blonigen (2001), using product-level data, finds FDI and exports are substitutes when FDI is horizontal. However, these studies only focus on the relationship between outward FDI flows and exports.

Our framework is closer to Zhang and Felmingham (2001) who investigate the

[7] More recent development in the literature can be also found in Helpman, et al. (2004) who find that the heterogeneity of firms in the industry is also an important determinant for the choice between exporting and foreign production through FDI.

causal relationship between inward FDI to China and Chinese exports. Using data from both national and provincial levels, they confirm that the causal relationship is bidirectional. Especially for the causality from inward FDI flows to exports, they argue that foreign investors who have superior knowledge on world market conditions tend to be successful in exporting their products from the host country. In any case, these previous researches only looked at trade-FDI relationships between two countries, depicted as figure 1.a and figure1.b.

In this paper we extend the investigation on the FDI-trade relationship to a three-country framework. Given the recent trends in international trade which involve a quite deal of intra-firm or intra-industry trade and FDI flows, that expand hand-in-hand with global trade, we think that investigating the dynamics of trade in the conventional bilateral framework is not sufficient. In order to examine the dynamics of trade between China and the US, for example, we cannot ignore the effects of trade flows between China and other countries (besides the US), and FDI flows from other countries (besides the US) into China. In what follows, we attempt to generalize the complex trilateral trade and FDI relationship in a simplest manner.

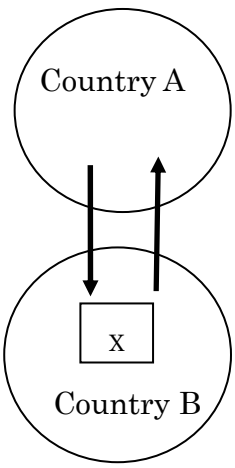

Figure 1.a: trade flows prior to FDI

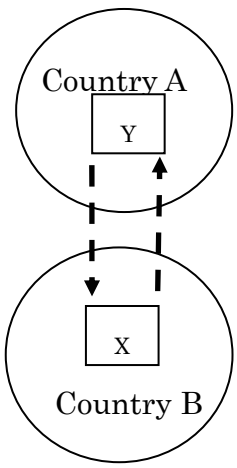

Figure 1.b: trade flows after FDI

A. Vertical Foreign Direct Investment

Let us consider the trade-FDI dynamics of one commodity among three countries: the US, Japan, and a third country which we call China for now. For the sake of brevity, we assume that the US provides a market for the commodity, and that Japan has a multinational firm that produces the commodity. The multinational firm may involve two firms for the production of the commodity: an upstream firm, U, and a downstream firm, D, while the former supplies intermediate goods to the latter which sells the final product to the US market. If both downstream and upstream firms are established in Japan, the product will be exported directly from Japan to the US. The trade dynamics of this first, base case are shown in Figure 2.a. Arrows in the figure represent flows of goods. In this case international trade flows are purely bilateral between the US and Japan, and involve no foreign production or FDI by the Japanese multinational.

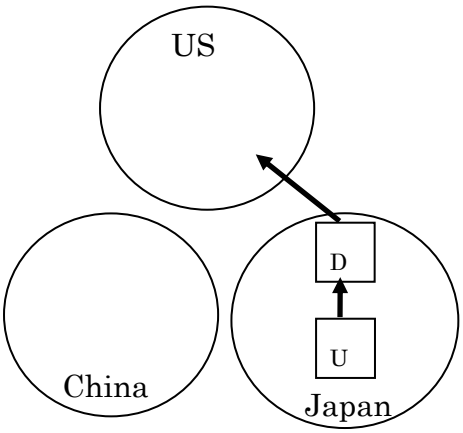

Figure 2.a : trade flows prior to

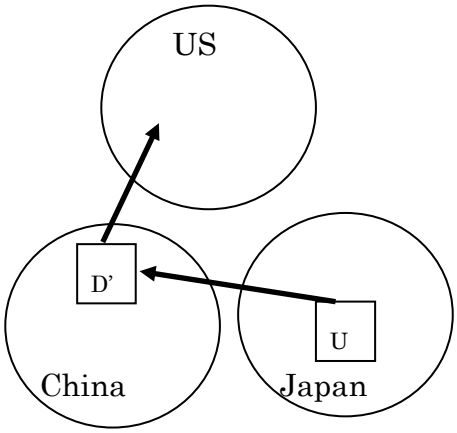

Figure 2.b: trade flows after

Now, we consider a next case where the Japanese multinational makes vertical

FDI.[8] The Japanese multinational firm fragments its production by establishing a downstream firm D' in China as a vertical FDI, and exports the product from there. This case is depicted in Figure 2.b. We assume for simplicity that the domestic downstream plant D is shut down once the Japanese-affiliated plant D' is established in China, and therefore that all of the exports come from D'. This case leads to three changes in the trade flows among the three countries. First, Japanese exports to the US stop because of the shut-down of the domestic plant D. Second, Japanese exports to China, instead, arise involving intra-firm trade between the parent firm U and its foreign affiliate D'. Third, Chinese exports to the US emerge because the Japanese downstream plant in China starts shipping the product to the US.

In reality, a trilateral relationship is not as clear-cut as is shown above. However, we can generally predict that if Japanese firms are shifting their production to China through vertical FDI, Japanese exports to the US would decrease while both Japanese exports to China and Chinese exports to the US would increase. Thus, when vertical FDI is made, while Japanese exports of a certain product are observed to be decreasing, Japanese producers may be still exporting the same product to the US, but by bypassing through China.

B. Horizontal Foreign Direct Investment

Next, we turn to a case where the Japanese multinational makes horizontal FDI.[9] Figure 3.a depicts the base model for this case in which the Japanese multinational, M, exports its product directly to the US. However, unlike the case in

[8] We can also consider the case in which the multinational firm shifts its upstream firm to the local market. However, this case still does not alter the nature of the existing trade flows.
[9] For the analysis on the determinants of vertical and horizontal trade, refer to Aizenman and Marion (2001).

Figure 2.a, we assume that the multinational does not possess a vertical chain of production – the firm's production is vertically internalized. Figure 3.b shows the case where horizontal FDI occurs, so that the product is now being exported directly from China instead of Japan. In reality, as in Figure 2.b, the trade flows based on horizontal FDI would entail a decrease in Japanese direct exports to the US, but an increase in Chinese exports to the US. However, unlike in the previous case with vertical FDI, the shift in the trade flows in this case does not lead to any intra-firm trade between Japan and China.[10]

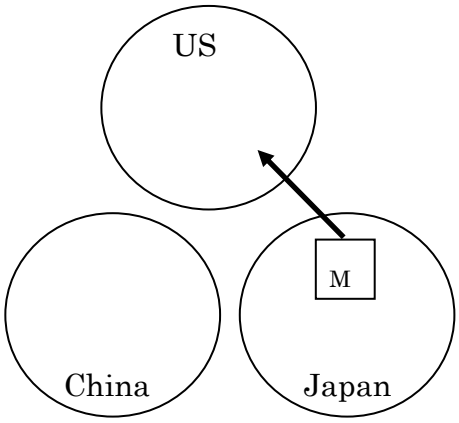

Figure 3.a: trade flows prior

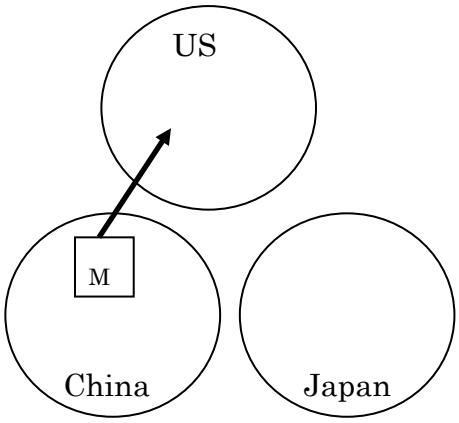

Figure 3.b: trade flows after

3-3. Do Imports Promote Export?

Besides FDI flows, other factors can affect the trilateral trade relationship. Some studies find that the imports of foreign products with higher quality can force domestic competitors to become more efficient through international competition. MacDonald (1994) finds that US industries' productivity level rose as the import

[10] The presence of foreign affiliates can also create spillover effects on local exporters. Javorcik (2004) finds evidence for positive spillover effects of foreign affiliates on their local suppliers. Spillovers from foreign affiliates can help local firms not only to improve their productivity level, but also to become competitive exporters in the international markets. In such a case, we can expect an increase in the exports of the FDI-receiving country.

penetration ratio increased.[11] An overwhelming amount of studies, on the other hand, find that more efficient firms tend to export. Bernard and Jensen (1999) find that both the growth rates and the levels of success measures are higher for exporters in ex-ante, i.e., "good firms become exporters." Combining these two findings and applying to our trilateral trade analysis, we can hypothesize that an increase in the exports from a Japanese firm (JPN) to China may lead a Chinese domestic firm (CHN) to become more efficient and start exporting. This case is shown in Figure 4. Although the trade flows look alike to the case in Figure 2.b, this case does not involve any FDI flows.

3-4. Competition or Complements

Lastly, not the least, we can think of a case where Japanese exports to the US and Chinese exports to the US are substitutes. This is highly probable for an industry in which the exports of the two countries are similar in quality (see Figure 5). In this case, head-to-head competition may arise between Japanese and Chinese firms, which can be observed as a negative correlation between Japanese and Chinese exports to the US.

On the other hand, Japanese and Chinese exports to the US could have a complementary relationship if both countries produce intermediate products, but each for different production stages, and export them to the US market where a firm in the US produces the final goods using these intermediate products. In this case, we should observe a positive correlation between Japanese and Chinese exports to the US. It is, however, unlikely to find products from two countries to be complements if we use data based on the industry classification as disaggregated as the HS 4-digit level, which we

[11] In a more generalized sense, we can also think that competitive pressure can increase the productivity of firms or industries. Galdon-Sanchez and Schmitz (2002) find that competitive pressure in iron-ore markets led to an increase in US labor productivity.

use in our study. Therefore, we should expect to find a negative correlation between Japanese and Chinese exports to the US with an assumption that the competitive effect outweighs the complimentary effect.

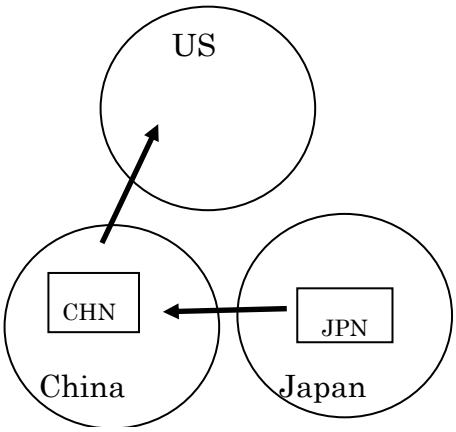

Figure 4: positive spillover effect from imports

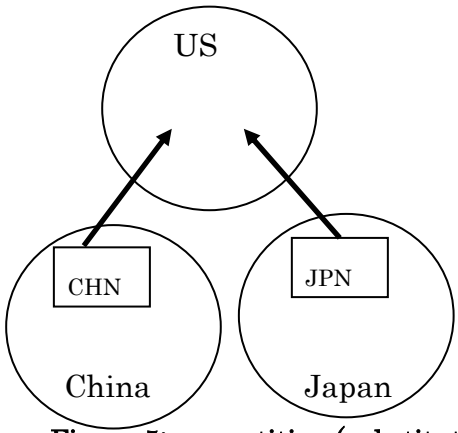

Figure 5: competition (substitutive relationship): negative correlation

3-5. The "Triangular Trade Approach"

The above discussions have shown the complexity of the trade-FDI dynamics, but also demonstrated that we can unravel the complex dynamics by examining the relationships between different flows of trade among the three countries. Figure 5 presents a generic export flow chart among the three countries. The Japanese exports to the US and those to China are denoted as JPNUS and JPNCHN, respectively, while the Chinese exports to the US is denoted as CHNUS.[12]

[12] For the sake of brevity, we continue to use China as the third country. However, in the empirical analysis section, we will test seven other Asian countries as the third countries.

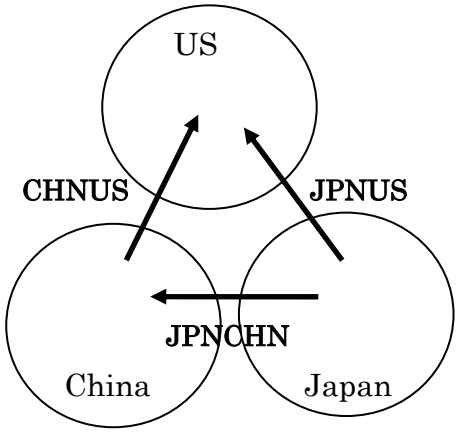

Figure 6: the Triangular Trade Approach

Table 6 summarizes all the scenarios we discussed and expected signs for the correlations between two of the three trade flows. As for the relationship between JPNCHN and CHNUS, we should expect a positive correlation if vertical FDI is made by Japanese firms to China or if Japanese exports to China create spillover effects on Chinese firms and lead them to export to the US. As for the relationship between JPNUS and CHNUS, we should expect a negative correlation if vertical or horizontal FDI is made by Japanese firms to China or if the products from China and Japan are in direct competition in the US market.[13]

Table 6: Expected Signs for the Correlation between Trade Flows

	JPNCHN and CHNUS	**JPNUS and CHNUS**
Vertical FDI	positive	negative
Horizontal FDI	–	negative
Imports-Exports	positive	–
Competition	–	positive

[13] The cells with "–" indicate that there is no specific theoretical prediction for the sign of the correlation.

In this study, we will employ what we call the "triangular trade approach," in which we will examine the type of trade-FDI dynamics by empirically looking at the correlations between the two types of trade flows as shown in Table 6 in the trilateral trade relationship among Japan, the US, and China (or other "third countries"). More specifically, we will use the export flow from China, or third countries, to the US (CHNUS or THDUS) as the dependent variable in the empirical model while including Japan's exports to China, or the third countries (JPNCHN or JPNTHD) as well as Japan's exports to the US (JPNUS) as explanatory variables.

4. The Data

The exports data used in this study are extracted at the HS 4-digit level from *International Trade by Commodity Statistics, Harmonized System Rev.1,* OECD. At this level of disaggregation, there are 1,367 commodity classifications. From this set of data, we select our sample in the following two steps. First, we remove the commodities which are either not traded between a pair of countries or missing in *any* of the years in our sample period of 1990 through 2000. We also restrict our sample to comprise the commodities for which a complete set of observations exists with a strictly positive amount of trade for the entire sample period. Second, since we need three flows of exports for each of the "third countries" (seven Asian countries and China): Japanese exports to the third country; Japanese exports to the US; and the third country's exports to the US, we restrict our data to only those commodities for which *all of the three* export flows exist. This selection process reduces the number of observations considerably, and also causes it to vary (even for the same HS 4-digit classification codes) depending on the third countries due to data availability. For

example, there are 576 commodities for China while there are only 162 commodities for Indonesia.[14]

Annual observations of exchange rate volatility are constructed from monthly exchange rates from IMF's *International Financial Statistics*. Other macroeconomic variables, such as inflation rates, real GDP per capita, nominal GDP, and aggregate trade flows, are retrieved from IMF's *IFS* and *Direction of Trade*. We also include the trade intensity indices for each pair of trading countries using the method in Frankel and Rose (1997) and the data from *DOT* and *IFS*. More details on the data definitions are given in Appendix 1.

5. Empirical Results with the Base Model

5-1. Model Specification and Empirical Results

First, we specify our panel data estimation equation for the first-differenced trade among three countries as equation (1).

$$\Delta T_{i,t}^{USTHD} = \alpha \Delta T_{i,t}^{JPNTHD} + \beta \Delta T_{i,t}^{JPNUS} + \lambda_i + \varepsilon_{i,t} \qquad (1)$$

$\Delta T_{i,t}^{USTHD}$ is the first-differenced export of a third-country to US, $\Delta T_{i,t}^{JPNTHD}$ is the first-differenced Japanese export to a third-country and $\Delta T_{i,t}^{JPNUS}$ is the first-differenced Japanese export to US for commodity i at year t. λ_i is a fixed-effect for commodity i.

With HS4 commodity fixed-effect dummies, export to the US is regressed on

[14] The numbers of commodities for Asian economies are 576 for China, 572 for Korea, 487 for Hong Kong, 288 for Singapore, 310 for Thailand, 162 for Indonesia, 180 for the Philippines, and 218 for Malaysia. For American continent countries, the numbers of commodities are 86 for Argentina, 275 for Brazil, 503 for Canada and 331 for Mexico while these for European countries are 558 for France, 644 for Germany, 473 for Italy and 623 for UK.

JPNTHIRD and JPNUS for each individual country. The estimated results are presented in Table 7. The estimated coefficient for Japanese exports to a third-country is almost always positive when statistically significant. The size of the coefficients is found to be higher for Asian countries, reflecting a stronger tie with the Japanese economy. Especially for Korea, Singapore and Malaysia, their estimated coefficients are 0.30, 0.31 and 0.73, respectively, tenfold of the average coefficient among the European countries. Also for Mexico, a country closer to the US, the estimated coefficient is notably as large as 0.95, almost one to one correspondence between the Japanese exports to Mexico and the Mexican exports to the U.S. For Canada, however, the estimated coefficient is negative and (statistically) significantly large.

The expected sign for the coefficient of the Japanese exports to the US can be positive when there are common factors causing the world exports to increase (e.g. high growth of the US markets). It can be negative, however, when the products of Japan and a third-country are competing head-to-head. Also, if a large portion of the third-country export to the US is related to the products of Japanese affiliated firms, a production shift between Japan and the third-country can account for the negative relationship.

The estimated coefficient is positive with statistical significance for most of the countries. For these countries with significant positive coefficient, the estimated coefficients are less than 0.1 – an increase in Japanese exports to US leads to an increase in the export of that country to US markets in the order of 10 percent. For Korea and Canada, the coefficients are even higher as 0.22 and 0.27, respectively. Most strikingly, the estimated coefficient for China is negative, -0.04, with statistical significance. This is a strong supporting evidence for a view that Japanese multinational corporations are shifting their production location from Japan to China

and a decrease in the exports to US markets is substituted by an increase in the exports by Japanese affiliates in China.

Next, we combined all individual countries in one panel data set. With results from previous individual country estimation, we assume the impact of Japanese trade on the export of a third-country to be different among the countries in our sample. The specification for our model needs to allow for heterogeneous coefficients as in equation (2). Subscript j is added to denote for j-th country. D^j is a dummy variable which takes value 1 for a country j and zero otherwise.

$$\Delta T_{i,j,t}^{THDUS} = \sum_{j=1}^{J} \alpha_j D^j \Delta T_{i,j,t}^{JPNTHD} + \sum_{j=1}^{J} \beta_j D^j \Delta T_{i,j,t}^{JPNUS} + \lambda_{i,j} + \varepsilon_{i,j,t} \qquad (2)$$

In Table 8 we report the panel data estimation result of all 16 countries combined. In this regression we did not restrict industries in each country to be same, so the total number of observation is the sum of Table 5, 62,860. The result remains quite similar to those in Table 7.

5-2. Country Characteristics as Explanatory Variables

As often found in bilateral trade estimation using gravity model, we include macroeconomic variables in addition to Japanese trade variables we have used in previous regressions. $Z_{j,t}^{k}$ represents k-th exogenous variables for country j at year t.

$$\Delta T_{i,j,t}^{THDUS} = \sum_{j=1}^{J} \alpha_j D^j \Delta T_{i,j,t}^{JPNTHD} + \sum_{j=1}^{J} \beta_j D^j \Delta T_{i,j,t}^{JPNUS} + \sum_{k=1}^{K} \phi_k Z_{j,t}^{k} + \lambda_{i,j} + \varepsilon_{i,j,t} \qquad (3)$$

In contrast to previous studies in empirical bilateral trade literature, most of macroeconomic variables turned out to be insignificant, see Table 9. In addition there is only a little improvement in adjusted R-squared.

We strongly doubt that the failure of macroeconomic variables in explaining the export of third country to US rests on relatively small number of different values these macroeconomic variables can take. For example, NY_US, nominal income of the US, can take only 10 different values in a sample space of 62,860 observations. In contrast, the number of different values for dependent export variable is approximately equal to the number of observation. Explanatory power of macroeconomic variables in previous studies on bilateral trade hinges on the use of aggregated trade data. We would need to construct some data with more variation which corresponds more closely to that of dependent variable.

6. The Empirical Results with More Disaggregated Explanatory Variables

Given the above discussion, we reestimate our estimation model using more disaggregated data for the control variables. Instead of the macroeconomic variables we used above, we include US total imports (disaggregated at the HS 4-digit level) to control for changes in US demand for each commodity, and Japanese FDI (at the HS 2-digit level) to capture a possible production shift by Japanese multinational corporations.

6-1. Data Construction

As the income level of a country can be an appropriate explanatory variable in conventional bilateral trade models with aggregate trade data, we can expect the amount of income allocated for a particular commodity to be an explanatory variable

for our model with disaggregated trade data. From this perspective, we then choose an actual expenditure allocated for each imported commodity, i.e., total import for each HS 4-digit commodity, as a proxy variable, hoping that this variable will circumvent the simultaneity problem for the JPNUS variable. For this variable, we use the same data set from OECD's *International Trade by Commodity Statistics, Harmonized System Rev.1*, and call this variable USMAR.[15] Unlike the macroeconomic variables, this variable takes as many different values as the dependent variable.

In section 3, we discussed that Japanese FDI to the third countries may lead to an increase in the third countries' exports to the US while the Japanese FDI brings about vertical intra-firm trade between parent multinationals and their subsidiaries overseas (see Figure 2.b). Hence, the estimation for the effect of Japanese exports to the third countries on the latter's exports to the US in the previous analysis may have reflected the effect of Japanese FDI flows to the third countries. In this section, we include in our estimation a variable that specifically refers to Japanese FDI to the third countries, so that the effect of Japanese FDI can be separated from that of Japanese exports to the third countries. For that variable, we use the data from the *Overseas Japanese Companies Data* (*OJCD*) from Toyo Keizai. OJCD contains the information for approximately 19,000 Japanese overseas subsidiaries, categorized in 68 industry classifications (which do not correspond to HS industry classifications), including each subsidiary's established year, location, business objectives, industry classification, and other relevant information. Among the 68 industries, we exclude those industries which do not actively engage in goods trade such as real estate and banking sectors. Then, we reallocate OJCD's codes to corresponding HS 2-digit codes and reclassify the

[15] Like other trade-related variables, we include USMAR as the first differenced variable.

data to create the FDI data based on the HS classifications.[16] The new variable refers to Japanese FDI in the Asian third countries in terms of the number of the subsidiaries established by Japanese firms for each host country, year, and HS 2-digit industry code.[17]

6-2. The Estimation Result

We incorporate equation (2) with FDI and US import variables as equation (4).

$$\Delta T_{i,j,t}^{THDUS} = \sum_{j=1}^{J} \alpha_j D^j \Delta T_{i,j,t}^{JPNTHD} + \sum_{j=1}^{J} \beta_j D^j \Delta T_{i,j,t}^{JPNUS} + \sum_{j=1}^{J} \delta_j D^j FDI_{i,j,t} + \sum_{j=1}^{J} \gamma_j D^j USIMP_{i,j,t} + \lambda_{i,j} + \varepsilon_{i,j,t} \quad (4)$$

The result of estimation for equation (4) is summarized in Table 10. The coefficients of FDI are significantly positive only for China and Mexico. The coefficients of USIMP are all positive and significant.

We can observe some striking results for the estimated coefficients of Japanese exports to a third-country. The estimated coefficient of Japanese export to China becomes no longer significant. For estimation result for equation (2) we observed that Japanese exports to China is promoting Chinese exports to US. However, this effect disappears after controlling FDI in equation (4). With these results combined, we can conclude that Japanese export to China is promoting Chinese export to US only through shift of Japanese production plants to China.

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[16] The concordance table is shown in Appendix 2. When a particular OJCD code covers more than two HS 2-digit codes, the FDI data for this OJCD code is counted in all corresponding HS 2-digit codes.

[17] Therefore, two different HS 4-digit codes with the same first two digits share the same number of accumulated Japanese affiliated firms. This may not be problematic as long as there is cross-industry effect within the HS 2-digit level since we are trying to capture the trade-promoting effect of FDI.

Mexican export to US is in stark contrast to the case of China. The coefficient of Japanese export to Mexico remains significant at one percent level while the coefficient of FDI is also positive at one percent significance level. For Mexico we can infer that Japanese exports to Mexico have some enhancement effect on Mexican exports to US in addition to Japanese FDI-related exports. The persistence of positive coefficient of Japanese export to Mexico can be attributed to technological-transfer effect or competitive effect of foreign products imported, described in section 3.

In contrast to the result of Table 8, in which China and Philippine are only countries with significantly negative coefficients for Japanese exports to US, the coefficients of additional seven countries become negative with five percent significance level. These seven countries are Indonesia, Malaysia, Mexico, Brazil, France, Italy and UK. We believe including a USIMP variable, a proxy for expenditure level in each commodity market, eliminated positive income effect of US market growth previously captured by the JPNUS variable. It is noteworthy that the coefficient of JPNUS for China is relatively larger than those of other countries. The degree of competition between Chinese exports and Japanese export is very high.

We also investigated equation (4) with inclusion of macroeconomic variables. The estimation result is summarized in Table 11. The qualitative result remains same[18].

7. Conclusions

In our empirical exploration, we found that the exports of China and those of Japan are directly competing in US markets while the exports of China to the US also

[18] The coefficient of FDI for China becomes statistically insignificant; however, its p-value is 13.4%.

appears to be promoted partly by Japanese exports to China. However, after controlling for Japan's FDI to China on industry category, the trade enhancing effect of Japanese exports disappears. With a statistically significant coefficient for Japanese FDI to China, we can conclude that Japanese exports to China seem to promote Chinese exports to the US because of increasing vertical trades between Japanese multinationals and their corresponding affiliates in China. The combined evidence of the substitutive relationship between Chinese and Japanese exports to the US and the export-promoting effect of Japanese FDI to China confirms a view that while Chinese exports compete vigorously with Japanese exports in US markets, Japanese multinationals are shifting their production bases to China and forming a global production network.

Our results for other Asian countries show that Indonesian and Philippine exports are also competing with Japanese exports in US markets. However, the degree of the competition with Japanese exports is found to be much higher for China. We also found some evidence that the impact of Japanese trade on exports of third-country to the US in general is larger in Asia. This is especially true for Korea, Malaysia, Philippine, and Singapore.

Mexican export to the U.S. appears in stark contrast to the case of China. Even after we control for Japanese FDI to Mexico, trade promoting effect of Japanese export to Mexico still remains positive and significant. One interpretation suggests that technological spillover from Japanese export to tradable sectors in Mexico is much greater because rules of origin require participation from and dissemination of technology to local firms. Similarly with China, Japanese FDI to Mexico provides trade enhancement effect to Mexican exporting sectors. This is quite in conformity with findings of Cuadros et al (2004) in which total FDI in Mexico are found to Granger cause Mexican trade.

It is also noteworthy that our empirical evidence indicates that the impact of Japanese trade is stronger for countries in American Continent than those in Europe. These evidences combined may seem to suggest that proximity of third-country either to competing country, i.e., Japan, or to destination country, i.e., the U.S., is the major factor for determining the degree of impact.

Our study shed light on the current debate about the trade disputes between China and the US from a different angle and presented results that may involve political ramifications. The main finding from our empirical analysis indicates that a surge in Chinese exports to the US may involve a quite deal of products manufactured by Japanese affiliates in China and therefore may simply reflect change in Japanese multinational corporations' strategy in global production. Of course, for industries in which Chinese exports are currently under allegations, these particular products individually may not be strongly related to Japanese multinational operations. With the general perception of Chinese exports "threatening" US industry, however, we will probably continue to see more cases against China brought into the WTO trade dispute settlement mechanism. Eventually, we may also see cases against China, but the ones that actually involves products of Japanese multinational corporations.

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Appendix 1:

exvol_US = exchange volatility between THD's currency and the U.S. dollars

exvol_JPN = exchange volatility between THD's currency and Japanese yen

inf_THD = THD's inflation rate

inf_US = US inflation rate

inf_JPN = Japanese inflation rate

rypc_THD = real GDP per capita of THD

rypc_US = real GDP per capita of US

rypc_JPN = real GDP per capita of Japan

ny_THD = nominal GDP of THD

ny_US = nominal GDP of US

ny_JPN == nominal GDP of Japan

W_IMP_THD = THD's imports from the world

W_IMP_US = US imports from the world

W_IMP_JPN = Japanese imports from the world

W_EXP_THD = THD's exports to the world

W_EXP_US = US exports to the world

W_EXP_JPN = Japanese exports to the world

Appendix2: Concordance Table for FDI and Trade Classification

HS Code	Toyo Keizai Code				HS Code	Toyo Keizai Code			
	1st	2nd	3rd	4th		1st	2nd	3rd	4th
1					53	700	2700		
3	200	600	2600		54	700	2700		
5	200	600	2600		55	700	2700		
6	200	2600			56	700	2700		
7	200	600	2600		57	700	2700		
9	200	600	2600		58	700	2700		
10	200	600	2600		59	700	2700		
11	200	600	2600		60	700	2700		
12	200	600	2600		61	700	2700		
13	200	600	2600		62	700	2700		
14	200	600	2600		63	700	2700		
15	200	600	2600		64				
16	600				65				
17	600				66				
18	600				67				
19	600				68	1400	3200		
20	600				69	1400	3200		
21	600				70	1400	3200		
22	600				71				
23	600				72	1500	3300		
24					73	1500	3300		
25	300				74	1600	1700	3400	3500
26	300				75	1600	1700	3400	3500
27	300	1200	3000		76	1600	1700	3400	3500
28	1100	2900			78	1600	1700	3400	3500
29	1100	2900			79	1600	1700	3400	3500
30	1100	2900			80	1600	1700	3400	3500
31	1100	2900			81	1600	1700	3400	3500
32	1100	2900			82	1600	1700	3400	3500
33	1100	2900			83	1600	1700	3400	3500
34	1100	2900			84	1800	3600		
35	1100	2900			85	1900	3700		
36	1100	2900			86	2000	3800		
37	1100	2900			87	2100	3900		
38	1100	2900			88	2000	3800		
39	1100	2900			89	2000	3800		
40	1300	3100			90	2200	4000		
41	1300	3100			91	2200	4000		
42	1300	3100			92	2300			
44	800	2800			93				
46	800	2800			94				
48	900	2800			95				
49	1000				96				
50	700	2700			97				
51	700	2700							
52	700	2700							

Table 1: China's Trade with Major Trading Partners

(thousands of dollars)

Imports

	1992		1995		1998		2000	
1	Hong Kong	20,533,589	Japan	29,004,529	Japan	28,275,074	Japan	41,509,675
2	Japan	13,682,461	United States	16,118,291	United States	16,883,171	Taiwan	25,493,561
3	United States	8,900,735	Taiwan	14,783,944	Taiwan	16,631,051	Korea	23,207,406
4	Taiwan	5,865,971	Korea	10,293,234	Korea	15,014,348	United States	22,363,148
5	Germany	4,015,042	Hong Kong	8,590,713	Germany	7,020,657	Germany	10,408,731
	World	80,585,333	World	132,083,539	World	140,236,807	World	225,093,731

Exports

	1992		1995		1998		2000	
1	Hong Kong	37,512,229	Hong Kong	35,983,427	Hong Kong	38,741,792	United States	52,099,220
2	Japan	11,678,713	Japan	28,466,685	United States	37,947,666	Hong Kong	44,518,285
3	United States	8,593,800	United States	24,713,498	Japan	29,660,114	Japan	41,654,314
4	Germany	2,447,990	Korea	6,687,805	Germany	7,354,309	Korea	11,292,364
5	Korea	2,404,912	Germany	5,671,451	Korea	6,251,516	Germany	9,277,790
	World	84,940,062	World	148,779,565	World	183,809,065	World	249,202,551

Source: ITCS,OECD

Table 2: Shares of Trade with Japan and the US among the Asian countries

Exporting Country

	1990		1995		2000	
	Japan	US	Japan	US	Japan	US
China	0.15	0.08	0.19	0.17	0.17	0.21
Korea	0.19	0.29	0.13	0.19	0.12	0.22
Hong Kong	0.06	0.24	0.06	0.22	0.06	0.23
Singapore	0.09	0.21	0.08	0.18	0.08	0.17
Thailand	0.17	0.23	0.17	0.18	0.15	0.21
Indonesia	0.43	0.13	0.27	0.14	0.23	0.14
Philippine	0.20	0.38	0.16	0.36	0.15	0.30
Malaysia	0.15	0.17	0.12	0.21	0.13	0.21

Importing Country

	1990		1995		2000	
	Japan	US	Japan	US	Japan	US
China	0.14	0.12	0.22	0.12	0.18	0.10
Korea	0.25	0.23	0.24	0.23	0.20	0.18
Hong Kong	0.16	0.08	0.15	0.08	0.12	0.07
Singapore	0.20	0.16	0.21	0.15	0.17	0.15
Thailand	0.30	0.11	0.29	0.12	0.25	0.12
Indonesia	0.25	0.11	0.23	0.12	0.16	0.10
Philippine	0.18	0.20	0.22	0.18	0.19	0.17
Malaysia	0.24	0.17	0.27	0.16	0.21	0.17

Source: *Direction of Trade*, IMF

Table3 : Japanese Foreign Direct Investment to the Asia countries (1989 - 2002)

(100 million Yen)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
China	587	511	787	1,381	1,954	2,683	4,319	2,828	2,438	1,377	849	1,112	1,808	2,152
	(126)	(165)	(246)	(490)	(700)	(636)	(770)	(365)	(258)	(114)	(78)	(105)	(189)	(263)
Korea	799	419	357	291	289	420	433	468	543	389	1,094	899	704	763
	(81)	(54)	(48)	(28)	(34)	(27)	(25)	(33)	(53)	(48)	(62)	(52)	(47)	(44)
Hong Kong	2,502	2,610	1,260	966	1,447	1,179	1,106	1,675	860	789	1,088	1,039	374	248
	(335)	(244)	(178)	(154)	(184)	(112)	(119)	(89)	(121)	(51)	(76)	(52)	(37)	(31)
Singapore	2,573	1,232	837	875	735	1,101	1,143	1,256	2,238	832	1,102	505	1,433	915
	(181)	(139)	(103)	(100)	(97)	(69)	(94)	(102)	(96)	(58)	(51)	(25)	(31)	(34)
Thailand	1,703	1,696	1,107	849	680	749	1,196	1,581	2,291	1,760	924	1,030	1,105	614
	(403)	(377)	(258)	(130)	(127)	(126)	(147)	(196)	(154)	(72)	(72)	(62)	(51)	(52)
Indonesia	840	1,615	1,628	2,142	952	1,808	1,548	2,720	3,085	1,398	1,024	464	622	509
	(140)	(155)	(148)	(122)	(115)	(116)	(168)	(160)	(170)	(64)	(57)	(26)	(56)	(41)
Philippine	269	383	277	210	236	683	692	630	642	488	689	514	951	500
	(87)	(58)	(42)	(45)	(56)	(75)	(100)	(75)	(64)	(46)	(32)	(44)	(25)	(20)
Malaysia	902	1,067	1,202	919	892	772	555	644	971	668	588	256	320	98
	(159)	(169)	(136)	(111)	(92)	(51)	(57)	(69)	(82)	(34)	(44)	(23)	(18)	(11)
World	90,339	83,527	56,862	44,313	41,514	42,808	49,568	54,095	66,236	52,413	74,703	53,854	39,922	44,175
	(6589)	(5863)	(4564)	(3741)	(3488)	(2478)	(2863)	(2501)	(2495)	(1616)	(1729)	(1701)	(1768)	(2144)

Source: *Outward Direct Investment*, Ministry of Finance, Japan. Figures in parentheses indicates the number of FDI cases.

Table 4: Mexico's Trade with Major Trading Partners

Imports (thousands of dollars)

	1992		1995		1998		2000	
1	United States	45,640,600	United States	53,784,324	United States	93,149,905	United States	135,323,974
2	Japan	2,819,088	Japan	3,951,072	Germany	4,541,975	Germany	5,285,861
3	Germany	2,318,560	Germany	2,686,360	Japan	4,534,795	Japan	3,447,084
4	France	1,260,217	Canada	1,374,035	Canada	2,255,646	Canada	3,386,463
5	Brazil	1,029,262	France	978,959	Korea	1,822,463	Korea	1,874,931
	World	61,923,146	World	72,452,988	World	125,323,804	World	171,058,090

Exports

	1992		1995		1998		2000	
1	United States	37,052,881	United States	65,063,498	United States	101,974,910	United States	146,648,432
2	Spain	1,232,191	Canada	2,060,803	Canada	1,716,021	Canada	3,302,315
3	Canada	1,009,236	Japan	1,017,282	Germany	1,110,454	Germany	1,542,286
4	Japan	843,112	Spain	877,852	Brazil	737,788	Spain	1,509,996
5	France	591,332	Brazil	853,395	Chile	731,369	Japan	930,066
	World	45,944,859	World	79,277,692	World	117,342,753	World	165,272,079

Source: ITCS, OECD

Table 5 : Japanese Foreign Direct Investment to Latin American Countries (1989-2002)

100 million Yen
(Cases)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Argentina	4	304	55	24	39	21	110	15	70	164	9	45	21	44
	(1)	(4)	(6)	(2)	(1)	(2)	(8)	(3)	(6)	(9)	(3)	(4)	(1)	(1)
Brazil	464	892	235	606	492	1,308	287	993	1,451	597	730	249	1,714	495
	(39)	(15)	(16)	(40)	(29)	(33)	(38)	(31)	(34)	(29)	(25)	(9)	(6)	(11)
Chile	62	43	102	35	4	14	136	2	28	25	15	31	38	7
	(10)	(11)	(8)	(7)	(2)	(2)	(6)	(2)	(5)	(7)	(1)	(2)	(1)	(2)
Mexico	47	248	261	78	61	651	202	128	393	106	1,655	230	58	103
	(9)	(14)	(13)	(14)	(12)	(8)	(9)	(10)	(11)	(11)	(27)	(5)	(4)	(8)

Source: *Outward Direct Investment* , Ministry of Finance, Japan. Figures in parenthesis indicate the number of FDI cases.

Table 7: Within-Estimators for Exports to US by Individual Country

Exporting Country	JPNTHIRD		JPNUS		Adj.R2	NOB
China	0.125	***	-0.048	***	0.51	5760
Korea	0.301	***	0.215	***	0.33	5720
Taiwan	0.156	***	0.073	***	0.40	6300
Hong Kong	0.071	***	0.022	***	0.14	4870
Singapore	0.319	***	0.082	***	0.11	2880
Thailand	0.006		0.024	***	0.34	3100
Indonesia	0.024	*	-0.004	*	0.10	1620
Philippine	0.161	***	-0.024	***	0.49	1800
Malaysia	0.732	***	0.053	***	0.39	2180
Canada	-2.240	***	0.275	***	0.49	5030
Mexico	0.946	***	0.031	***	0.37	3310
Brazil	-0.086	**	0.005	***	-0.04	2750
Argentina	0.003		0.001		-0.07	860
France	0.095	***	0.014	***	0.04	5580
Germany	0.004		0.089	***	0.30	6440
Italy	0.016		0.018	***	0.10	4730
UK	0.032		0.039	***	0.08	6230

Table8 : Sixteen Country Within Estimation

NOB= 62860 SSR=$1.83891*10^{14}$ Adj.R^2= 0.3937

Variable	Coefficient	Variable	Coefficient
JPNCHN	0.125***	**JPNUS(CHN)**	-0.048***
	(0.035)		(0.008)
JPNKOR	0.301***	**JPNUS(KOR)**	0.215***
	(0.021)		(0.006)
JPNHKG	0.071**	**JPNUS(HKG)**	0.022**
	(0.034)		(0.009)
JPNSGP	0.319***	**JPNUS(SGP)**	0.082***
	(0.026)		(0.010)
JPNTHA	0.006	**JPNUS(THA)**	0.024***
	(0.049)		(0.009)
JPNIDN	0.024	**JPNUS(IDN)**	-0.004
	(0.050)		(0.009)
JPNPHL	0.161*	**JPNUS(PHL)**	-0.024***
	(0.095)		(0.008)
JPNMAL	0.732***	**JPNUS(MAL)**	0.053***
	(0.038)		(0.010)
JPNCAN	-2.240***	**JPNUS(CAN)**	0.275***
	(0.036)		(0.006)
JPNMEX	0.946***	**JPNUS(MEX)**	0.031***
	(0.087)		(0.006)
JPNBRA	-0.086	**JPNUS(BRA)**	0.005
	(0.128)		(0.006)
JPNARG	0.003	**JPNUS(ARG)**	0.001
	(0.495)		(0.009)
JPNFRA	0.095	**JPNUS(FRA)**	0.014**
	(0.078)		(0.006)
JPNGER	0.004	**JPNUS(GER)**	0.089***
	(0.023)		(0.006)
JPNITA	0.016	**JPNUS(ITA)**	0.018***
	(0.103)		(0.006)
JPNUK	0.032	**JPNUS(UK)**	0.039***
	(0.041)		(0.006)

Note: standard deviations are in parentheses. ***, **, and * denote significance at 1, 5, and 10 percent level, respectively.

Table 9 : Sixteen Country Within Estimation with Macro variables

NOB= 62860 SSR=.182901*10^{15} Adj.R^2= 0.3968

Variable	Coefficient	Variable	Coefficient	Variable	Coefficient
JPNCHN	0.123***	**JPNUS(CHN)**	-0.049***	**IMP_US**	0.122
	(0.035)		(0.008)		(0.121)
JPNKOR	0.296***	**JPNUS(KOR)**	0.215***	**IMP_JPN**	-0.151
	(0.021)		(0.006)		(0.201)
JPNHKG	0.077**	**JPNUS(HKG)**	0.022**	**EXP_US**	1.080***
	(0.034)		(0.009)		(0.107)
JPNSGP	0.318***	**JPNUS(SGP)**	0.082***	**EXP_JPN**	-0.211
	(0.026)		(0.010)		(0.214)
JPNTHA	0.016	**JPNUS(THA)**	0.024***	**EXVOL_US**	-1,877.750
	(0.049)		(0.009)		(8,295)
JPNIDN	0.029	**JPNUS(IDN)**	-0.003	**INF_THD**	-0.122
	(0.050)		(0.009)		(1.078)
JPNPHL	0.165*	**JPNUS(PHL)**	-0.023***	**INF_US**	-1,399.770
	(0.094)		(0.008)		(1,581)
JPNMAL	0.734***	**JPNUS(MAL)**	0.053***	**NY_THD**	0.000
	(0.038)		(0.010)		(0.004)
JPNCAN	-2.236***	**JPNUS(CAN)**	0.272***	**NY_US**	-0.048***
	(0.036)		(0.006)		(0.018)
JPNMEX	0.945***	**JPNUS(MEX)**	0.030***	**NY_JPN**	0.002
	(0.087)		(0.006)		(0.003)
JPNBRA	-0.085	**JPNUS(BRA)**	0.005	**TRADEINT2_US**	-4,990.010
	(0.128)		(0.006)		(5,308)
JPNARG	0.000	**JPNUS(ARG)**	0.002	**TRADEINT2_JPN**	1,932.610
	(0.494)		(0.009)		(4,356)
JPNFRA	0.090	**JPNUS(FRA)**	0.015***	**IMP_WORLD_THD**	0.007
	(0.078)		(0.006)		(0.029)
JPNGER	0.003	**JPNUS(GER)**	0.090***	**IMP_WORLD_US**	0.166***
	(0.023)		(0.006)		(0.063)
JPNITA	0.019	**JPNUS(ITA)**	0.018***	**IMP_WORLD_JPN**	-0.035
	(0.103)		(0.006)		(0.044)
JPNUK	0.032	**JPNUS(UK)**	0.039***	**EXP_WORLD_THD**	0.024
	(0.041)		(0.006)		(0.027)
				EXP_WORLD_US	0.018
					(0.040)
				EXP_WORLD_JPN	-0.161**
					(0.081)

Note: standard deviations are in parentheses. ***, **, and * denote significance at 1, 5, and 10 percent level, respectively.

Table10 : Panel Estimates with Heterogenous Coefficients (16 Countries)

NOB= 62860 SSR = $.153418*10^{15}$ Adj.R^2= .494 (0.4939)

Variable	Coefficient	Variable	Coefficient	Variable	Coefficient	Variable	Coefficient
JPNCHN	0.038	**JPNUS(CHN)**	-0.141***	**FDICHN**	51.358***	**USIMP(CHN)**	0.052***
	(0.032)		(0.008)		(19)		(0.002)
JPNKOR	0.202***	**JPNUS(KOR)**	0.055***	**FDIKOR**	-531.120**	**USIMP(KOR)**	0.093***
	(0.019)		(0.006)		(213)		(0.002)
JPNHKG	0.048	**JPNUS(HKG)**	0.012	**FDIHKG**	-42.172	**USIMP(HKG)**	0.006***
	(0.033)		(0.009)		(152)		(0.002)
JPNSGP	0.263***	**JPNUS(SGP)**	0.063***	**FDISGP**	-107.803	**USIMP(SGP)**	0.017***
	(0.026)		(0.010)		(164)		(0.003)
JPNTHA	-0.002	**JPNUS(THA)**	0.013	**FDITHA**	-27.908	**USIMP(THA)**	0.006**
	(0.045)		(0.010)		(64)		(0.003)
JPNIDN	0.026	**JPNUS(IDN)**	-0.020**	**FDIIDN**	-76.020	**USIMP(IDN)**	0.008***
	(0.045)		(0.009)		(213)		(0.002)
JPNPHL	-0.003	**JPNUS(PHL)**	-0.083***	**FDIPHL**	90.768	**USIMP(PHL)**	0.031***
	(0.088)		(0.010)		(270)		(0.003)
JPNMAL	0.440***	**JPNUS(MAL)**	-0.041***	**FDIMAL**	-647.534***	**USIMP(MAL)**	0.068***
	(0.037)		(0.009)		(176)		(0.003)
JPNCAN	-1.900***	**JPNUS(CAN)**	0.024***	**FDICAN**	874.617*	**USIMP(CAN)**	0.134***
	(0.034)		(0.007)		(508)		(0.002)
JPNMEX	0.916***	**JPNUS(MEX)**	-0.170***	**FDIMEX**	2,617.740***	**USIMP(MEX)**	0.113***
	(0.079)		(0.007)		(433)		(0.002)
JPNBRA	-0.095	**JPNUS(BRA)**	-0.021***	**FDIBRA**	-34.160	**USIMP(BRA)**	0.015***
	(0.117)		(0.006)		(547)		(0.002)
JPNARG	0.003	**JPNUS(ARG)**	-0.014	**FDIARG**	-751.063	**USIMP(ARG)**	0.008***
	(0.452)		(0.009)		(3687)		(0.003)
JPNFRA	0.036	**JPNUS(FRA)**	-0.018***	**FDIFRA**	-55.887	**USIMP(FRA)**	0.019***
	(0.072)		(0.006)		(398)		(0.002)
JPNGER	0.032	**JPNUS(GER)**	0.024***	**FDIGER**	-128.939	**USIMP(GER)**	0.037***
	(0.021)		(0.006)		(210)		(0.002)
JPNITA	-0.073	**JPNUS(ITA)**	-0.016**	**FDIITA**	-36.647	**USIMP(ITA)**	0.020***
	(0.095)		(0.007)		(766)		(0.002)
JPNUK	0.105***	**JPNUS(UK)**	-0.038***	**FDIUK**	44.835	**USIMP(UK)**	0.043***
	(0.038)		(0.007)		(199)		(0.002)

Note: standard deviations are in parentheses

Table11 : Panel Estimates with Heterogenous Coefficients (16 Countries)

NOB= 62860 SSR= $1.53232*10^{14}$ Adj.R^2= .494 (0.4943)

Variable	Coefficient	Variable	Coefficient	Variable	Coefficient	Variable	Coefficient	Variable	Coefficient
JPNCHN	0.036	**JPNUS(CHN)**	-0.141***	**FDICHN**	30.709	**USIMP(CHN)**	0.051***	**IMP_US**	0.098
	(0.032)		(0.008)		(21)		(0.002)		(0.114)
JPNKOR	0.198***	**JPNUS(KOR)**	0.055***	**FDIKOR**	-672.792***	**USIMP(KOR)**	0.093***	**IMP_JPN**	-0.191
	(0.019)		(0.006)		(218)		(0.002)		(0.187)
JPNHKG	0.052	**JPNUS(HKG)**	0.012	**FDIHKG**	-24.346	**USIMP(HKG)**	0.007***	**EXP_US**	0.349***
	(0.033)		(0.009)		(160)		(0.002)		(0.108)
JPNSGP	0.264***	**JPNUS(SGP)**	0.063***	**FDISGP**	-31.852	**USIMP(SGP)**	0.017***	**EXP_JPN**	0.127
	(0.026)		(0.010)		(168)		(0.003)		(0.198)
JPNTHA	0.004	**JPNUS(THA)**	0.012	**FDITHA**	-9.383	**USIMP(THA)**	0.007**	**EXVOL_US**	1,275.260
	(0.045)		(0.010)		(66)		(0.003)		(7,622)
JPNIDN	0.029	**JPNUS(IDN)**	-0.020**	**FDIIDN**	-17.233	**USIMP(IDN)**	0.008***	**INF_THD**	0.219
	(0.045)		(0.009)		(218)		(0.002)		(0.999)
JPNPHL	0.002	**JPNUS(PHL)**	-0.083***	**FDIPHL**	96.418	**USIMP(PHL)**	0.031***	**INF_US**	1,377.510
	(0.088)		(0.010)		(273)		(0.003)		(1,469)
JPNMAL	0.441***	**JPNUS(MAL)**	-0.041***	**FDIMAL**	-588.633***	**USIMP(MAL)**	0.068***	**NY_THD**	-0.001
	(0.037)		(0.009)		(182)		(0.003)		(0.004)
JPNCAN	-1.899***	**JPNUS(CAN)**	0.024***	**FDICAN**	23.120	**USIMP(CAN)**	0.134***	**NY_US**	0.023
	(0.034)		(0.007)		(542)		(0.002)		(0.016)
JPNMEX	0.911***	**JPNUS(MEX)**	-0.170***	**FDIMEX**	2,085.950***	**USIMP(MEX)**	0.113***	**NY_JPN**	-0.002
	(0.080)		(0.007)		(454)		(0.002)		(0.003)
JPNBRA	-0.092	**JPNUS(BRA)**	-0.022***	**FDIBRA**	-59.509	**USIMP(BRA)**	0.015***	**TRADEINT2_US**	8,419.060*
	(0.117)		(0.006)		(559)		(0.002)		(5,124)
JPNARG	0.009	**JPNUS(ARG)**	-0.014	**FDIARG**	-98.299	**USIMP(ARG)**	0.008***	**TRADEINT2_JPN**	600.325
	(0.452)		(0.009)		(3,708)		(0.003)		(4,103)
JPNFRA	0.032	**JPNUS(FRA)**	-0.018***	**FDIFRA**	-98.840	**USIMP(FRA)**	0.019***	**IMP_WORLD_THD**	-0.003
	(0.072)		(0.006)		(410)		(0.002)		(0.027)
JPNGER	0.031	**JPNUS(GER)**	0.025***	**FDIGER**	-274.517	**USIMP(GER)**	0.037***	**IMP_WORLD_US**	-0.092
	(0.021)		(0.006)		(219)		(0.002)		(0.058)
JPNITA	-0.076	**JPNUS(ITA)**	-0.016**	**FDIITA**	-158.597	**USIMP(ITA)**	0.020***	**IMP_WORLD_JPN**	-0.011
	(0.095)		(0.007)		(779)		(0.002)		(0.040)
JPNUK	0.105***	**JPNUS(UK)**	-0.038***	**FDIUK**	-29.684	**USIMP(UK)**	0.043***	**EXP_WORLD_THD**	0.041
	(0.038)		(0.007)		(205)		(0.002)		(0.026)
								EXP_WORLD_US	-0.025
									(0.037)
								EXP_WORLD_JPN	0.076
									(0.075)