

How does China compete with Japan in the US Market?

A Triangular Trade Approach*

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[Abstract]

Political conflicts among trading partners have changed their forms with ever-increasing flows of foreign direct investment. A decrease in the exports of Japan might merely be a reflection of a global production shift by Japanese multinational corporations. We investigate the effect of Japanese trade on the exports of other countries to the United States in the 1990s. In our sample we include eight Asian countries, four American Continent countries and four European countries besides the US and Japan. With the trade data disaggregated at the HS 4-digit level, we regress the exports of a third-country to the US on the Japanese exports to the US and the Japanese exports to a third-country in a panel data specification. Among 16 countries investigated, we find the evidence that Chinese and Japanese exports are substitutes in the US market while the exports of China to the US are partly promoted by Japanese exports to China. The estimation result confirms a view that China competes vigorously with Japan in the US market while Japanese multinationals are adjusting their production bases to China in a process of reforming a new global production network.

Key Words: China, Foreign Direct Investment, Japan, Trade, Triangular Trade Approach.

JEL Classification: F14, F23

1. Introduction

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 manufacturers¹. Other manufacturing products under debate are bedroom furniture, television sets, handbags and handcars.

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 Japan², Japanese exporters in textile, automobile and semiconductor industries were put under allegations of unfair trade by US competitors.

¹ 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.

² 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 industrial countries.

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 economy³. 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 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

³ See Fung and Iizaka (1998) for a detailed description of Hong Kong's role as a re-exporter of US and Japanese exports.

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.

In this study we investigate whether Japanese trade have affected the exports of China to the US. To be precise about the definition of Japanese trade in this study, we use Japanese exports to two destinations; Japanese exports to China and Japanese exports to the US. As a robustness check for possible peculiarity of Chinese trade, we also investigate the effect of Japanese trade on the exports of other countries to the United States. In our sample we include other seven Asian countries, four American Continent countries and four European countries besides the US and Japan. For the remainder of the paper, we refer a country other than the US and Japan as the "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) 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. Section 2 reviews previous studies in the literature and gives theoretical backgrounds for our framework of a triangular trade approach. In section 3 we describe our data set. Section 4 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 5 discusses the estimation results with more disaggregate explanatory data, namely foreign direct investment at industry level and US total import at commodity level. Section 6 reconsiders information contents of macroeconomic variables in interaction terms with trade variables. Section 7 presents conclusions.

2. A Triangular Trade Approach and Related Literature

In this section we first review previous researches in a broad range of literature; FDI versus exports, FDI-related trade, competitive pressure for productivity growth, and high productivity of exporting firms. Then we propose our triangular trade approach to incorporate most of the features from these studies.

2-1. FDI and Export in a Two-Country Framework

In serving a foreign market a multinational firm can choose to export their products or produce products through their foreign subsidiaries. The main focus of research papers investigating the choice of multinational corporations between foreign production and exports is to find whether their relationship is substitute or

complimentary⁴. Yamawaki (1991), Clausing (2000) and Head and Ries (2001) find empirical evidences that support complimentary relationship between foreign productions and exports. Belderbos and Sleuwaegen (1998) find substituting relationship between Japanese FDI and Japanese export only when their intention of FDI is to avoid antidumping tariffs in Europe. Blonigen (2001) using product-level data also find substitute relationship between FDI and export when FDI is horizontal. However, these studies only focus on outward FDI and outward flow of international trade from a country.

The work of Zhang and Felmingham (2001) is more closely related to our framework. They investigate the causal relationship between inward foreign direct investment in China and export from China. Their empirical results using both national data and provincial data confirm that their causality relationship is bidirectional. For the causality from inward FDI to export, they argue that foreign investors having superior knowledge on world market become more successful in exporting of product from a host country.

2-2. FDI and Export in a Three-Country Framework

In this subsection we extend investigation of FDI-export relationship to a three-country framework. In the followings we distinguish clearly vertical FDI from horizontal FDI. For the case of vertical FDI we also need to distinguish whether an investment is for a downstream firm or an upstream firm. We first consider the case of vertical FDI in Figure 1. In Figure 1(a), both an upstream firm and a downstream firm

⁴ Of course, there are other important studies in this area besides investigating relationship between export and FDI. For example Helpman et al. (2004) use ratio of export sales and foreign sales for his study. They found heterogeneity of firms in the industry is also important determinant for the choice between export and FDI.

are established in Japan and a downstream firm exports final products to the US. Figure 1(b) depicts a shift of a downstream plant to China and its effect on international trade among three countries. By comparing Figure 1(a) and 1(b), Japanese export to US decreases while both Japanese export to China and Chinese export to US increase with vertical FDI for downstream firm,.

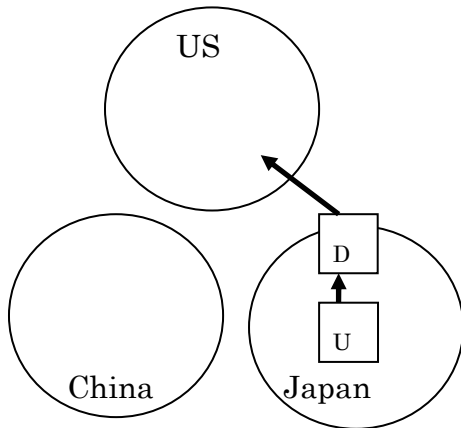


Figure 1 (a): Vertical FDI

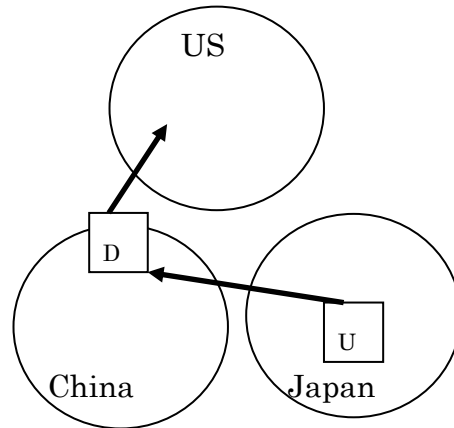


Figure 1 (b): Vertical FDI

Figure 1(c) depicts the case of vertical FDI for an upstream firm and resulting trade after FDI. With a FDI for an upstream firm in China, Japanese export to US is unchanged while a new trade flow from China emerges for supplying intermediate product to a Japanese downstream plant.

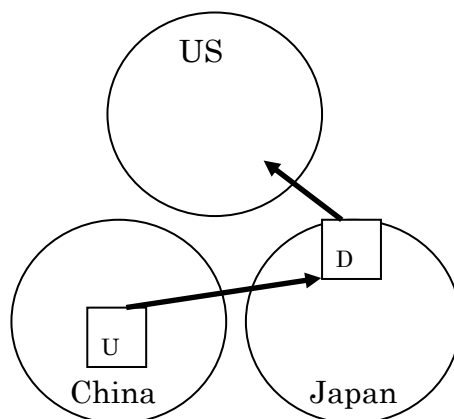


Figure 1 (c): Vertical FDI

Next, we turn to a horizontal FDI case in Figure 2. In Figure 2(a) a Japanese multinational corporation is exporting its products to the US. Figure 2(b) represents

that horizontal FDI in China causes Japanese export to diminish and creates Chinese export to the US.

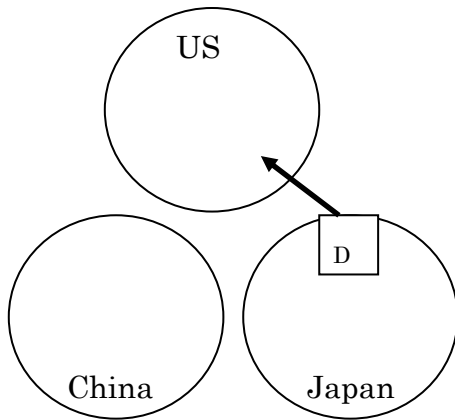


Figure 2 (a): Horizontal FDI

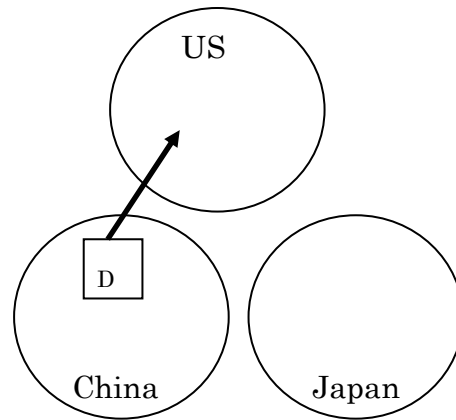


Figure 2 (b): Horizontal FDI

2-3. Do Imports Promote Export?

In justifying an existence of a possible relation between Japanese export to a third-country and third-country export, there are also other channels besides FDI related trade. Some studies found that imports of foreign products with higher quality force domestic competitors to become more efficient producers in order to survive in an industry. MacDonald (1994) found for US industries that growth of import ration raised productivity growth. In a more generalized term, we can also ask whether competitive pressure increases productivity of firms. Galdon-Sanchez and Schmitz (2002) found supporting evidence that competitive pressure in iron-ore markets led to an increase in labor productivity.

Also, overwhelming evidences are documented that more efficient firms are inclined to export. Bernard and Jensen (1999) found that both growth rates and levels of success measures are higher ex-ante for exporters. Therefore, it is plausible that an increase in import from Japan in an industry of a third-country causes domestic firms to be more efficient and to become new exporters.

2-4. Competition

Lastly, but not the least, we could expect the effect of Japanese export to US on Chinese export to US to be negative or substitute if Japanese export products and Chinese export products are in direct competition in the US market, see Figure 4.

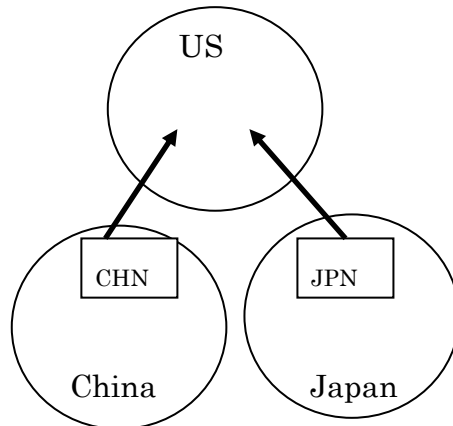


Figure 4: Competition

2-5. A Triangular Trade Approach

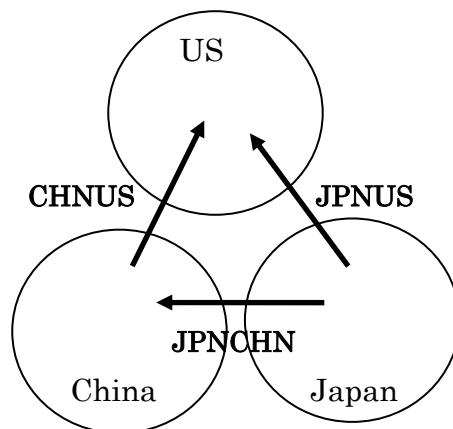


Figure 3: Triangular Trade

From above arguments we could concentrate on three different flows of international trade among three countries. In Figure 3 we combined all previous figures in a single figure with suppression of firms and FDIs. Our main interest in empirical investigation is to estimate the effect of Japanese exports, $JPNUS$ and $JPNCHN$, on Chinese exports to US, $CHNUS$. We named this framework to be called a 'triangular trade approach.'

3. The Data

Export data used in our study are taken at HS 4-digit level from International Trade by Commodity Statistics, Harmonized System Rev.1, OECD. At HS 4-digit level, there are 1,367 commodity classifications. From this entire sample, we have taken selection procedures in two steps. First, there are many commodities at HS4 classification level without any amount of trade between a pair of countries, either for some years or for entire sample periods. We have restricted our sample to include only commodities with complete observations of strictly positive amount of trade during sample period from 1990 to 2000. Second, for each “third country,” we are interested in three kinds of export data among Japan, the US, and a third-country; namely Japanese exports to third-country, Japanese exports to the US and third-country exports to the US. We have further restricted only those commodities with complete observations for all three kinds of exports. Therefore, number of observations for each third-country varies although HS 4-digit classification codes are common among our sample countries. For example, there are 644 commodities with complete observations for Germany while only 86 commodities for Argentina.

Exchange rate volatility for each year is calculated from monthly exchange rates, taken from *International Financial Statistics*, IMF. Other macroeconomic variables are readily available from *IFS*, IMF and *Direction of Trade*, IMF. These are inflation rate, real GDP per capita, nominal GDP and aggregate trade flows. We also constructed trade intensity variable between a pair of countries from *DOT*, IMF. Definitions for all these variables are given in Appendix 1.

3-1. Statistical Summary

Standard statistical summary of data are shown in Table 3. In order to check

for possible collinearity among explanatory variables prior to running regressions, correlation matrix for variables is presented in Table 4. Any figures greater than 0.88 in an absolute value of correlation are shown with the shade. Obviously variables with similar descriptions are highly correlated, e.g. Tradeint1 and Tradeint2. There are also noteworthy high correlations among variables with different descriptions. The most prominent pair is between US income variables and US total imports with correlation of 0.99. Other pairs with high correlation are between third-country income and third-country total exports, between US total exports and US income, between US total exports and US total imports, between third-country total exports and third-country total imports. We will avoid using these highly correlated variables in a same regression when possible in the empirical sections.

4. Preliminary Empirical Results

In this section we investigate bilateral trade in a three-country framework. Specifically, we analyze the effect of Japanese exports on the exports of third-countries to the US. For the followings we denote Japanese exports to a third-country as JPNTHIRD and Japanese exports to the US as JPNUS if necessary. In addition we also incorporate some macroeconomic variables as explanatory variables for the exports of a third country to the US as in the gravity model literature.

4-1. Preliminary Within Estimation Results

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

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

$\Delta T_{i,t}^{USTHD}$ 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 JPNTHIRD and JPNUS for each individual country. The estimated results are presented in Table 5. 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.

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

In Table 6 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 5.

4-2. 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.

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

In contrast to previous studies in empirical bilateral trade literature, most of macroeconomic variables turned out to be insignificant, see Table 7. 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.

5. The Empirical Results with More Disaggregated Explanatory Variables

In this section we incorporate two more variables much finer than macroeconomic variables in addition to previous export variables. The first variable is US total import disaggregated at HS4 level to control for changes in US demand for each commodity. The second variable is Japanese FDI concordant to HS2 classification to correctly capture the shift of production site for Japanese multinationals.

5-1. Data Construction

As income of a country is a significant explanatory variable in bilateral trade estimation model for explaining aggregate trade between two countries, we expect some expenditure variable, i.e., proportion of income allocated for each commodity, to be a significant explanatory variable for our framework. For this variable we can further exploit the same data source we used for export variables. From International Trade by Commodity Statistics, Harmonized System Rev.1, OECD, we constructed US total import disaggregated at HS4 level, namely USIMP. USIMP is also a first-differenced variable. This variable possibly takes as many different values as the dependent variable for each individual country.

Because FDI creates vertical trades between Japanese multinational firms and their subsidiaries, Japanese export to a third-country expands with increase in Japanese FDI in a third-country. In previous section we implicitly assumed that some portion of Japanese export reflect underlying FDI flows to a third-country. Then, this part of Japanese export is also assumed to be one the channels that affect the export of a third-country to US.

The Overseas Japanese Companies Data (OJCD), Toyo Keizai, contains relevant information for approximately 19,000 Japanese foreign subsidiaries with 68 industry classifications. From these 68 industries we excluded those industries which do not take an active role in goods trades, e.g., real estate and banking. We carefully examined these 43 industry classifications of OJCD and HS2 industry classifications. Then, we created a concordant table which reallocates OJCD codes to corresponding HS2 codes⁵. According to this concordant table, we constructed an FDI stock variable

⁵ When a particular OJCD code covers more than two codes of HS2 classification, FDI for this OJCD code is counted in all corresponding HS2 classification codes.

as the number of established subsidiaries by host country, year and HS2 industry classification code.

5-2. The Estimation Result

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

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

The result of estimation for equation (4) is summarized in Table 8. 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.

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 in section 2.

In contrast to the result of Table 6, 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 9. The qualitative result remains same⁶.

6. Searching an Explanation for Heterogeneous Coefficients

In previous section, we found that impact of Japanese trade on a third-country's export to the US is significantly different in panel data framework with heterogeneous coefficients. Then it is interesting to pursue what underlying macroeconomic characteristics of each country are causing difference in sensitivity of their exports responding to changes in Japanese exports. In this section we investigate the causes of heterogeneous coefficients of Japanese export variables by incorporating interaction terms between macro variables and Japanese export variables.

Instead of using heterogeneous coefficients to capture the different impact of

⁶ The coefficient of FDI for China becomes statistically insignificant; however, its p-value is 13.4%.

Japanese trade, we may introduce interaction terms between Japanese exports and exogenous variables⁷.

$$\begin{aligned} \Delta T_{i,j,t}^{THDUS} = & \alpha_0 \Delta T_{i,j,t}^{JPNTHD} + \sum_{k=1}^K \alpha_k (Z_{j,t}^k \cdot \Delta T_{i,j,t}^{JPNTHD}) \\ & + \beta_0 \Delta T_{i,j,t}^{JPNUS} + \sum_{k=1}^K \beta_k (Z_{j,t}^k \cdot \Delta T_{i,j,t}^{JPNUS}) + \lambda_{i,j} + \varepsilon_{i,j,t} \end{aligned} \quad (4)$$

α_0 captures a common effect among 16 countries when all macroeconomic variables take zero⁸. $\alpha_0 + \alpha_k Z_{j,t}^k$ denotes the effect of Japanese export to a third-country on dependent variable when macroeconomic variables take a $Z_{j,t}^k$ value. A similar explanation applies to β_0 and β_k .

6-1. Macro Variables as Interaction Term with Japanese Trade

Prior to using a set of macroeconomic variables in a regression, we have run an ordinary least square regression with one exogenous variable at one time. The estimated coefficients along adjusted R² are reported in Table 10. Although most of estimated coefficients are statistically significant, an improvement in adjusted R² is small if any. However, for EXP_US, third-country's export to the US, and TRADEINT1_US and TRADEINT2_US, trade intensity indices between the US and a third country, we found significant increases in adjusted R².

In Table 11 the estimated result of ordinary least square regression with

⁷ Equation (4) can be reduced to equation (2) by allowing only country dummies as exogenous variables, so the former can be understood as a generalization of the latter.

⁸ Since some of macroeconomic variables never take zero, we need to be careful when we interpret the estimated coefficient. Therefore, we use mean values of macroeconomic variables in section 6-2.

country dummies and sets of macroeconomic variables are reported. Selected sets of macroeconomic variables are only reported, although we have attempted to run different combinations of macroeconomic variables. Qualitative results are similar for regressions with any combination of macroeconomic variables. A direct interpretation of estimation result is not straight forward.

6-2. Simulated Combined Effects

We rewrite equation (4) in the following.

$$\begin{aligned} \Delta T_{i,j,t}^{THDUS} = & \alpha_0 \Delta T_{i,j,t}^{JPNTHD} + \sum_{k=1}^K \alpha_k (Z_{j,t}^k \cdot \Delta T_{i,j,t}^{JPNTHD}) \\ & + \beta_0 \Delta T_{i,j,t}^{JPNUS} + \sum_{k=1}^K \beta_k (Z_{j,t}^k \cdot \Delta T_{i,j,t}^{JPNUS}) + \lambda_{i,j} + \varepsilon_{i,j,t} \end{aligned} \quad (4)$$

With interaction terms in equation (4), a net effect of changes in Japanese exports can be shown as the sum of α_0 and $\alpha_k \cdot Z_{j,t}^k$'s for Japanese exports to a third-country and the sum of β_0 and $\beta_k \cdot Z_{j,t}^k$'s for Japanese exports to the US. For $Z_{j,t}^k$ differs in time and country, net effects of Japanese exports are also different at points of time and among countries. In order to make a comparison possible among countries, we use mean values of Z 's for each country and calculate a net effect of Japanese exports. If these macroeconomic variables correctly capture country differences for the effect of Japanese exports, calculated net effects should be qualitatively similar to previous estimates in Table 6 to 9. Estimated coefficients from the regression with 12 exogenous variables in Table 11 are used for calculation.

For Japanese exports to third-countries, negative coefficients for Canada, the most striking aspect of regression results in previous estimates, is correctly replicated. Also for Brazil a calculated net effect is correctly negative although the coefficient for Brazil was not statistical significant in previous regressions. Signs of net effects are

correct for most countries; incorrect signs are obtained only for Mexico and UK. However, relative size of coefficients are often misrepresented, e.g. Hong Kong and Malaysia.

For Japanese exports to the US, negative coefficient for China is not replicated although (statistically insignificant) negative coefficients for Indonesia and Philippine are correctly replicated. Incorrect signs are obtained for Brazil, Argentina, and Italy.

7. Conclusions

Among 16 countries investigated in our study, we have found some evidence that the exports of China and those of Japan are substitutes in US markets while the exports of China to the US is partly promoted by Japanese exports to China. However, after controlling for FDI, trade enhancing effect of Japanese export to China disappears. The evidence of the substitutive relationship between Chinese and Japanese exports confirms a view that China competes vigorously with Japan in US markets while Japanese multinationals are adjusting production bases in a global production network.

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. 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 or to destination country is the major factor for determining the degree of impact. However, it can also be other macroeconomic characteristics of these countries that increase sensitivity of their exports with respect to Japanese exports.

It is intriguing to determine what underlying variables are causing higher

sensitivity of exports for Asian countries and American Continent countries with respect to Japanese exports. While many macroeconomic variables are statistically significant, we found some evidence that it is the intensity of trade between a third-country and the US that exports of a country to US become more sensitive to the changes in Japanese exports to the US.

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Appendix 1:

imp_US = total imports of the third country (THD) from the U.S.

imp_JPN = total imports of THD from Japan

exp_US = total exports of THD to the U.S.

exp_JPN = total exports of THD to Japan

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

dist_US = distance between the U.S. and THD

dist_JPN = distance between Japan and THD

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

tradeint1_XX (US or JPN) = normalized trade (trade intensity) using the equation

$$wt = \frac{X_{ijt} + M_{ijt}}{X_{i,t} + X_{j,t} + M_{i,t} + M_{j,t}} \quad (\text{in natural log})$$

where x_{ijt} denotes total nominal exports from third country i to j (US or Japan) during period t ; $X_{i,t}$ denotes total global exports from third country i ; and M denotes imports (equation (4) in Frankel and Rose [1997])

tradeint2_XX (US or JPN) = normalized trade using the equation

$$wt = \frac{X_{ijt} + M_{ijt}}{Y_{i,t} + Y_{j,t}} \quad (\text{in natural log})$$

where $Y_{i,t}$ is the level of nominal GDP in third country country i at period t .

IMP_world_THD = THD's imports from the world

IMP_world_US = US imports from the world

IMP_world_JPN = Japanese imports from the world

EXP_world_THD = THD's exports to the world

EXP_world_US = US exports to the world

EXP_world_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: Imports of China with 20 Major Trading Partners

1992	(thousand dollars)	1995	1998	2000				
1	HKG:Hong Kong China	20,533,589	JPN:Japan	29,004,529	JPN:Japan	28,275,074	JPN:Japan	41,509,675
2	JPN:Japan	13,682,461	USA:United States	16,118,291	USA:United States	16,883,171	TWN:Chinese Tapei	25,493,561
3	USA:United States	8,900,735	TWN:Chinese Tapei	14,783,944	TWN:Chinese Tapei	16,631,051	KOR:Korea	23,207,406
4	TWN:Chinese Tapei	5,865,971	KOR:Korea	10,293,234	KOR:Korea	15,014,348	USA:United States	22,363,148
5	DEU:Germany	4,015,042	HKG:Hong Kong China	8,590,713	DEU:Germany	7,020,657	DEU:Germany	10,408,731
6	RUS:Russian Federation	3,526,076	DEU:Germany	8,037,859	HKG:Hong Kong China	6,658,023	HKG:Hong Kong China	9,429,012
7	KOR:Korea	2,622,799	RUS:Russian Federation	3,798,640	SGP:Singapore	4,235,403	CHN:China	7,173,104
8	CAN:Canada	1,926,567	SGP:Singapore	3,397,831	RUS:Russian Federation	3,641,006	RUS:Russian Federation	5,769,892
9	ITA:Italy	1,748,061	ITA:Italy	3,115,048	FRA:France	3,204,856	MYS:Malaysia	5,479,997
10	AUS:Australia	1,671,164	CAN:Canada	2,681,312	CHN:China	3,020,253	SGP:Singapore	5,059,631
11	IDN:Indonesia	1,554,259	FRA:France	2,648,384	AUS:Australia	2,682,519	AUS:Australia	5,024,007
12	FRA:France	1,495,511	AUS:Australia	2,584,548	MYS:Malaysia	2,673,846	IDN:Indonesia	4,401,954
13	SGP:Singapore	1,235,994	CHN:China	2,255,056	IDN:Indonesia	2,460,855	THA:Thailand	4,380,787
14	GBR:United Kingdom	1,013,632	MYS:Malaysia	2,070,595	THA:Thailand	2,413,985	FRA:France	3,949,780
15	MYS:Malaysia	830,178	IDN:Indonesia	2,052,173	ITA:Italy	2,279,034	CAN:Canada	3,751,083
16	CHE:Switzerland	522,899	GBR:United Kingdom	1,972,063	CAN:Canada	2,237,214	GBR:United Kingdom	3,592,473
17	BRA:Brazil	519,322	THA:Thailand	1,610,768	SWE:Sweden	2,046,353	OMN:Oman	3,261,774
18	NLD:Netherlands	508,206	BRA:Brazil	1,231,546	GBR:United Kingdom	1,952,626	ITA:Italy	3,078,428
19	SWE:Sweden	475,754	XBL:Belgium-Luxembourg	1,146,948	FIN:Finland	1,259,952	SWE:Sweden	2,674,678
20	XBL:Belgium-Luxembourg	470,136	SWE:Sweden	999,751	BRA:Brazil	1,133,120	FIN:Finland	2,353,054
	AAA:World	80,585,333	AAA:World	132,083,539	AAA:World	140,236,807	AAA:World	225,093,731

Table 2: Exports of China with 20 Major Trading Partners

1992	1995	1998	2000					
1	HKG:Hong Kong China	37,512,229	HKG:Hong Kong China	35,983,427	HKG:Hong Kong China	38,741,792	USA:United States	52,099,220
2	JPN:Japan	11,678,713	JPN:Japan	28,466,685	USA:United States	37,947,666	HKG:Hong Kong China	44,518,285
3	USA:United States	8,593,800	USA:United States	24,713,498	JPN:Japan	29,660,114	JPN:Japan	41,654,314
4	DEU:Germany	2,447,990	KOR:Korea	6,687,805	DEU:Germany	7,354,309	KOR:Korea	11,292,364
5	KOR:Korea	2,404,912	DEU:Germany	5,671,451	KOR:Korea	6,251,516	DEU:Germany	9,277,790
6	RUS:Russian Federation	2,336,321	SGP:Singapore	3,500,636	NLD:Netherlands	5,161,746	NLD:Netherlands	6,687,219
7	SGP:Singapore	2,030,869	NLD:Netherlands	3,232,066	GBR:United Kingdom	4,631,773	GBR:United Kingdom	6,310,102
8	NLD:Netherlands	1,200,333	TWN:Chinese Tapei	3,098,059	SGP:Singapore	3,943,943	SGP:Singapore	5,761,041
9	ITA:Italy	1,095,254	GBR:United Kingdom	2,797,665	TWN:Chinese Tapei	3,868,899	TWN:Chinese Tapei	5,038,996
10	GBR:United Kingdom	922,839	ITA:Italy	2,067,166	FRA:France	2,822,808	ITA:Italy	3,802,022
11	THA:Thailand	894,807	FRA:France	1,841,824	ITA:Italy	2,577,422	FRA:France	3,705,164
12	FRA:France	763,507	THA:Thailand	1,751,751	AUS:Australia	2,364,965	AUS:Australia	3,428,877
13	TWN:Chinese Tapei	693,511	RUS:Russian Federation	1,664,663	CAN:Canada	2,126,873	CAN:Canada	3,157,838
14	AUS:Australia	660,812	AUS:Australia	1,626,187	RUS:Russian Federation	1,839,935	IDN:Indonesia	3,061,824
15	CAN:Canada	653,195	CAN:Canada	1,532,529	XBL:Belgium-Luxembourg	1,678,015	MYS:Malaysia	2,564,874
16	MYS:Malaysia	645,444	IDN:Indonesia	1,438,148	MYS:Malaysia	1,596,392	BEL:Belgium	2,300,740
17	PAK:Pakistan	551,435	MYS:Malaysia	1,280,995	ESP:Spain	1,544,076	THA:Thailand	2,243,253
18	ARE:United Arab Emirates	542,963	ARE:United Arab Emirates	1,101,097	PHL:Philippines	1,512,045	RUS:Russian Federation	2,233,350
19	PRK:Korea, Democratic People'	541,108	XBL:Belgium-Luxembourg	1,045,613	ARE:United Arab Emirates	1,291,321	ESP:Spain	2,151,954
20	XBL:Belgium-Luxembourg	540,989	PHL:Philippines	1,030,143	THA:Thailand	1,258,093	ARE:United Arab Emirates	2,078,437
	AAA:World	84,940,062	AAA:World	148,779,565	AAA:World	183,809,065	AAA:World	249,202,551

Table 3: Statistical Summary by Country

		China	Korea	Hong Kong	Singapore	Thailand	Indonesia	Philippine	Malaysia	Canada	Mexico	Brazil	Argentina	France	Germany	Italy	UK
JPNTHIRD	Mean	3448.18077	1952.57575	2303.60321	2673.49394	1493.17654	1155.57897	3058.26885	2894.21418	117.4515	811.36603	453.78988	244.6331	212.19854	204.86985	464.71967	525.32649
	Min	-400734.8438	-962758.75	-486618.3125	-1.10426D+06	-491766.375	-715698.8125	-83768.70313	-542435.75	-892287.3125	-183308.5469	-208645.0625	-38046.44141	-207146.1406	-1.01741D+06	-99525.36719	-444352.2813
	Max	447635.7813	817221.75	1070331.75	1449861.25	354814	467540.5938	412421	983442.5625	865725.1875	181070.2188	189616.5156	38004.15234	193532.5625	969820.75	285717.75	554586.25
THIRDUS	Mean	13662.30696	3525.08458	231.90643	2705.35525	2881.85747	2022.76409	5341.33908	8738.76674	16514.42477	22204.7887	890.87367	293.70426	1826.70476	3940.34075	1870.19138	2964.4386
	Min	-470141.4375	-814803.875	-195061.4844	-1.42874D+06	-194848.6094	-238249.0313	-307292.2188	-883015.5	-1.34196D+06	-439501	-290254.4375	-155744.8906	-622948.375	-1.10633D+06	-164733.0313	-733781.375
	Max	2169205	3069593	452473.5	2316151.75	426955.6875	207927.7188	1049390.625	2123401.75	4783764	5705992.5	421007.9375	191426.5313	802524.5625	2502701.25	411334.5	1070355.25
JPNUS	Mean	6324.49264	8115.24142	6921.95287	10998.29014	9626.83871	10513.48087	12918.60661	11657.90625	9354.25693	13548.66323	15736.01885	19213.39832	8577.54406	7462.61755	10195.54277	7742.07742
	Min	-1.90769D+06	-3.16080D+06	-1.90769D+06	-1.90769D+06	-1.90769D+06	-1.90769D+06	-1.90769D+06	-1.90769D+06	-1.90769D+06	-3.16080D+06	-3.16080D+06	-3.16080D+06	-1.90769D+06	-3.16080D+06	-3.16080D+06	-3.16080D+06
	Max	2334485.25	4849306	2334485.25	2334485.25	2334485.25	2334485.25	2334485.25	2334485.25	2334485.25	4849306	4849306	4849306	2334485.25	4849306	4849306	4849306
IMP_US	Mean	14897.498	24516.25	12626.48892	17270.17988	6679.90889	3907.90603	5027.27803	10414.25889	124296.2898	78601.15938	10881.52607	4392.40303	21987.14043	32226.40977	10019.61104	33877.43984
	Min	8010.27979	17952	7575.72021	10501.09961	3989.27002	2841.07007	2609.56006	5625.81982	82527.60156	40554.5	5545.41016	1498.01001	17606.40039	24235.59961	7778.70996	24276.30078
	Max	22374.59961	33322.80078	16200	22384.80078	9240.38965	5444.29004	7624.25	13668.09961	169068	140288	15777.90039	6103.62988	25303.80078	42791.39844	12452.7998	44996.5
IMP_JPN	Mean	26411.26006	25068.75	24012.89023	20262.5998	14933.3999	6490.52705	5443.94802	14862.04678	9948.58701	4394.41104	2749.847	862.498	8766.20898	22899.7502	4549.27996	14328.13994
	Min	10031.7002	16843.19922	16396.80078	14114.7002	10175.2998	2913.29004	2517	9581.66992	8430.20996	1961.71997	1265.56995	602.14001	7040.81982	20655	3819.19995	11913.2002
	Max	41511.80078	32606.40039	28630.69922	26308.09961	21625	9216.82031	7955.29004	21179.19922	12285.2002	7112.25977	3959.25	1442.16003	9766.19043	24590.30078	5933.8999	15906.7002
EXP_US	Mean	55915.88027	24269.33008	10564.5001	16728.03008	11702.45	7887.05994	8543.71011	16232.66997	152615.8102	72354.37031	9844.66001	2114.83998	20198.10996	40754.74941	18202.21006	29821
	Min	20305.09961	17362.30078	9739.90039	10216.2002	6451	3567.19995	3707.6001	6347.3999	93736.10156	31865.5	7232.2002	1297.5	13810.5	26985.09961	12340.59961	19050.59961
	Max	106215	40911	11861.40039	20648.40039	17161.40039	11097.40039	14216.40039	25990	229191	135080	14393.09961	3316.3999	30084.40039	59480.5	26000.80078	43676.80078
EXP_JPN	Mean	33289.97988	14589.2502	2100.40302	5140.85396	8351.53394	13428.07988	3967.99697	9668.76406	8744.03105	1566.12799	3221.39802	519.54699	5913.68491	11764.97393	5200.59211	6090.75405
	Min	14247.90039	11596.2002	1668.18005	3094.46997	5258.00977	10824.09961	2302.71997	6458.45996	7646.52002	1078.44995	2688.54004	428.60999	5148.2998	9824.33984	3845.34009	4900.99023
	Max	55155.89844	20453.59961	2736.04004	7331.87988	10595.2002	16371	7189.56006	14490.40039	10893.59961	2388.26001	3948.37012	699.67999	6692.87988	14189.2998	6777.16016	7412.33008
EXVOL_US	Mean	0.013398	0.023036	0.024147	0.011143	0.019587	0.047955	0.017818	0.017566	0.0099582	0.02566	0.043863	0.011878	0.00067633	0.023253	0.023976	0.021102
	Min	0.0000586	0.0027364	0.013572	0.0035171	0.0025035	0.0008126	0.00098272	0	0.0056723	0.001448	0.00077571	0	0.00016744	0.011129	0.0060193	0.011073
	Max	0.11239	0.10122	0.036636	0.033005	0.080021	0.25018	0.052188	0.070299	0.011953	0.1066	0.17809	0.11441	0.0021139	0.035534	0.042306	0.044289
EXVOL_JPN	Mean	0.035017	0.035828	0.026861	0.022542	0.032434	0.06178	0.033189	0.030043	0.027949	0.040562	0.059273	0.036148	0.02633	0.027292	0.031258	0.030788
	Min	0.014665	0.011844	0.015031	0.013135	0.0125	0.016736	0.014327	0.013827	0.018523	0.02146	0.014523	0.014685	0.01469	0.015941	0.014321	0.020343
	Max	0.10706	0.095936	0.034589	0.037043	0.07953	0.23578	0.059732	0.066569	0.046093	0.12199	0.18449	0.12056	0.045454	0.034589	0.057784	0.045052
INF_THD	Mean	7.474	5.1	5.344	1.729	4.536	14.112	8.596	3.553	1.999	18.692	549.21099	21.424	1.725	2.246	3.73	3.052
	Min	-1.41	0.82	-3.96	-0.27	0.31	3.72	4.32	1.53	0.19	6.97	3.2	-1.17	0.53	0.58	1.66	1.56
	Max	24.24	9.3	11.6	3.43	8.07	57.64	18.49	5.27	5.62	35	2075.88989	171.67	3.22	5.07	6.3	5.85
INF_US	Mean	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802	2.802
	Min	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55
	Max	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23	4.23
INF_JPN	Mean	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835
	Min	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67	-0.67
	Max	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24
DIST_US	Mean	11154.30957	11174.36035	13128.5498	15561.05957	14168.50977	16370.82031	13792.92969	15349.79004	733.89398	3038.55103	6798.51611	8401.52344	6168.60107	6405.55811	7222.46387	5904.03418
	Min	11154.30957	11174.36035	13128.5498	15561.05957	14168.50977	16370.82031	13792.92969	15349.79004	733.89398	3038.55103	6798.51611	8401.52344	6168.60107	6405.55811	7222.46387	5904.03418
	Max	11154.30957	11174.36035	13128.5498	15561.05957	14168.50977	16370.82031	13792.92969	15349.79004	733.89398	3038.55103	6798.51611	8401.52344	6168.60107	6405.55811	7222.46387	5904.03418
DIST_JPN	Mean	2101.53296	1158.401	2893.87402	5330.41309	4613.24023	5795.88477	3004.76709	5329.69385	10326.94043	11311.42969	17688.89063	18373.7793	9723.00781	9356.65918	9867.08691	9569.94141
	Min	2101.53296	1158.401	2893.87402	5330.41309	4613.24023	5795.88477	3004.76709	5329.69385	10326.94043	11311.42969	17688.89063	18373.7793	9723.00781	9356.65918	9867.08691	9569.94141
	Max	2101.53296	1158.401	2893.87402	5330.41309	4613.24023	5795.88477	3004.76709	5329.69385	10326.94043	11311.42969	17688.89063	18373.7793	9723.00781	9356.65918	9867.08691	9569.94141
RYPC_THD	Mean	601.64015	10761.71621	22144.70078	23391.72422	2648.95068	981.99688	1100.1521	4213.12832	20028.22402	3410.46101	4351.37163	7654.56333	27362.54609	30405.72266	19324.24297	19488.54004
	Min	376.07739	8622.31348	19591.88086	18417.57031	2136.6499	831.24371	1038.41699	3317.39307	18451.19922	3139.68701	3982.25098	6422.07617	26043.28906	29093.60938	18282.7793	17691.73047
	Max	824.0354	13062.15039	24218.03906	28229.57031	3021.26001	1136.81396	1167.39294	4840.25195	22541.42969	3819.09009	4624.39404	8462.62598	29810.73047	32623.2793	20885.21094	21666.92969

Table 4: Statistical Summary - Correlation Matrix

	JPNTHRD	THIRDUS	JPNUS	IMP_US	IMP_JPN	EXP_US	EXP_JPN	EXVOL_US	EXVOL_JPN	INF_THD	INF_US	INF_JPN	DIST_US	DIST_JPN	RYPC_THD
JPNTHRD															
THIRDUS	0.08														
JPNUS	0.23	0.21													
IMP_US	-0.01	0.07	0.00												
IMP_JPN	0.04	0.00	-0.01	-0.13											
EXP_US	-0.01	0.08	0.00	0.93	0.02										
EXP_JPN	0.03	0.03	-0.01	-0.07	0.62	0.24									
EXVOL_US	-0.04	-0.01	0.00	-0.09	-0.07	-0.12	-0.10								
EXVOL_JPN	-0.04	0.00	0.00	-0.05	-0.13	-0.04	0.00	0.89							
INF_THD	0.00	-0.01	0.02	-0.08	-0.18	-0.09	-0.09	0.32	0.31						
INF_US	0.05	-0.02	0.01	-0.10	-0.06	-0.12	-0.05	-0.12	-0.27	0.03					
INF_JPN	-0.02	-0.03	-0.02	-0.14	-0.18	-0.21	-0.16	0.06	-0.05	0.05	0.43				
DIST_US	0.03	-0.04	0.00	-0.70	0.38	-0.61	0.18	0.07	0.03	-0.05	0.00	0.00			
DIST_JPN	-0.03	0.00	0.01	0.29	-0.67	0.16	-0.46	0.05	0.09	0.29	0.00	0.00	-0.68		
RYPC_THD	-0.02	-0.03	-0.01	0.18	0.11	0.07	-0.33	-0.12	-0.23	-0.14	-0.04	-0.07	-0.37	0.25	
RYPC_US	0.00	0.03	0.01	0.20	0.15	0.27	0.17	0.03	0.09	-0.11	-0.48	-0.72	0.00	0.00	0.09
RYPC_JPN	-0.01	0.03	-0.01	0.20	0.16	0.26	0.18	0.01	0.05	-0.13	-0.43	-0.61	0.00	0.00	0.08
NY_THD	-0.02	-0.01	-0.01	0.08	0.08	0.10	0.13	-0.09	-0.11	-0.07	-0.09	-0.09	-0.53	0.39	0.63
NY_US	0.00	0.03	0.01	0.20	0.16	0.27	0.17	0.03	0.09	-0.11	-0.49	-0.74	0.00	0.00	0.09
NY_JPN	0.04	0.03	0.02	0.08	0.19	0.11	0.15	-0.07	0.06	-0.01	-0.19	-0.80	0.00	0.00	0.04
TRADEINT1_US	-0.01	0.07	-0.01	0.85	0.11	0.84	0.21	-0.13	-0.09	-0.11	-0.02	-0.02	-0.69	0.11	0.14
TRADEINT1_JPN	0.03	0.00	-0.01	-0.16	0.84	0.01	0.65	-0.06	-0.09	-0.18	0.02	0.02	-0.51	-0.83	-0.13
TRADEINT2_US	-0.01	0.07	-0.01	0.86	0.16	0.86	0.24	-0.13	-0.09	-0.14	-0.07	-0.10	-0.69	0.10	0.20
TRADEINT2_JPN	0.03	0.01	-0.02	-0.08	0.87	0.09	0.66	-0.07	-0.11	-0.23	-0.02	-0.02	-0.43	-0.79	-0.01
IMP_WORLD_THD	-0.02	0.00	-0.01	0.23	0.27	0.21	0.04	-0.10	-0.18	-0.16	-0.10	-0.19	-0.47	0.23	0.81
IMP_WORLD_US	0.01	0.03	0.02	0.20	0.17	0.27	0.18	0.02	0.08	-0.11	-0.40	-0.76	0.00	0.00	0.09
IMP_WORLD_JPN	0.01	0.03	-0.01	0.17	0.22	0.22	0.21	-0.05	0.02	-0.11	-0.17	-0.71	0.00	0.00	0.07
EXP_WORLD_THD	-0.01	0.01	-0.01	0.21	0.30	0.31	0.35	-0.11	-0.12	-0.14	-0.13	-0.20	-0.45	0.18	0.59
EXP_WORLD_US	-0.01	0.03	0.00	0.20	0.18	0.27	0.19	0.03	0.11	-0.12	-0.51	-0.71	0.00	0.00	0.09
EXP_WORLD_JPN	0.02	0.03	0.01	0.17	0.22	0.23	0.20	-0.02	0.09	-0.08	-0.34	-0.85	0.00	0.00	0.08

	RYPC_US	RYPC_JPN	NY_THD	NY_US	NY_JPN	TRADEINT1_US	TRADEINT1_JPN	TRADEINT2_US	TRADEINT2_JPN	IMP_WORLD_THD	IMP_WORLD_US	IMP_WORLD_JPN	EXP_WORLD_THD	EXP_WORLD_US	EXP_WORLD_JPN
JPNTHRD															
THIRDUS															
JPNUS															
IMP_US															
IMP_JPN															
EXP_US															
EXP_JPN															
EXVOL_US															
EXVOL_JPN															
INF_THD															
INF_US															
INF_JPN															
DIST_US															
DIST_JPN															
RYPC_THD															
RYPC_US															
RYPC_JPN	0.94														
NY_THD	0.09	0.10													
NY_US	1.00	0.95	0.10												
NY_JPN	0.35	0.33	0.06	0.39											
TRADEINT1_US	0.02	0.02	0.19	0.02	0.02										
TRADEINT1_JPN	-0.04	-0.03	-0.15	-0.04	0.01	0.11									
TRADEINT2_US	0.12	0.12	0.25	0.12	0.08	0.99	0.12								
TRADEINT2_JPN	0.07	0.09	-0.02	0.07	0.00	0.17	0.98	0.21							
IMP_WORLD_THD	0.24	0.25	0.89	0.25	0.13	0.28	-0.02	0.36	0.14						
IMP_WORLD_US	0.99	0.94	0.09	0.99	0.44	0.02	-0.04	0.12	0.07	0.25					
IMP_WORLD_JPN	0.74	0.84	0.10	0.76	0.69	0.02	-0.01	0.12	0.08	0.23	0.81				
EXP_WORLD_THD	0.26	0.26	0.92	0.26	0.11	0.33	0.08	0.41	0.22	0.91	0.26	0.22			
EXP_WORLD_US	0.96	0.98	0.11	0.97	0.44	0.02	-0.03	0.13	0.08	0.25	0.97	0.85	0.26		
EXP_WORLD_JPN	0.78	0.79	0.10	0.80	0.82	0.02	-0.01	0.12	0.06	0.23	0.84	0.94	0.22	0.85	

Table 5: Within-Estimators for Exports to US by Individual Country (All Industries)

<u>Exporting Country</u>	<u>JPNTHRD</u>	<u>JPNUS</u>	<u>Adj.R2</u>	<u>NOB</u>
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

Table 6: Sixteen Country Within Estimation

NOB= 62860	SSR=1.83891*10 ¹⁴	Adj.R ² = 0.3937	
Variable	Coefficient	Variable	Coefficient
JPNCHN	0.125*** (0.035)	JPNUS(CHN)	-0.048*** (0.008)
JPNKOR	0.301*** (0.021)	JPNUS(KOR)	0.215*** (0.006)
JPNHKG	0.071** (0.034)	JPNUS(HKG)	0.022** (0.009)
JPNSGP	0.319*** (0.026)	JPNUS(SGP)	0.082*** (0.010)
JPNTHA	0.006 (0.049)	JPNUS(THA)	0.024*** (0.009)
JPNIDN	0.024 (0.050)	JPNUS(IDN)	-0.004 (0.009)
JPNPHL	0.161* (0.095)	JPNUS(PHL)	-0.024*** (0.008)
JPNMAL	0.732*** (0.038)	JPNUS(MAL)	0.053*** (0.010)
JPNCAN	-2.240*** (0.036)	JPNUS(CAN)	0.275*** (0.006)
JPNMEX	0.946*** (0.087)	JPNUS(MEX)	0.031*** (0.006)
JPNBRA	-0.086 (0.128)	JPNUS(BRA)	0.005 (0.006)
JPNARG	0.003 (0.495)	JPNUS(ARG)	0.001 (0.009)
JPNFRA	0.095 (0.078)	JPNUS(FRA)	0.014** (0.006)
JPNGER	0.004 (0.023)	JPNUS(GER)	0.089*** (0.006)
JPNITA	0.016 (0.103)	JPNUS(ITA)	0.018*** (0.006)
JPNUK	0.032 (0.041)	JPNUS(UK)	0.039*** (0.006)

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

Table 7: 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*** (0.035)	JPNUS(CHN)	-0.049*** (0.008)	IMP_US	0.122 (0.121)
JPNKOR	0.296*** (0.021)	JPNUS(KOR)	0.215*** (0.006)	IMP_JPN	-0.151 (0.201)
JPNHKG	0.077** (0.034)	JPNUS(HKG)	0.022** (0.009)	EXP_US	1.080*** (0.107)
JPNSGP	0.318*** (0.026)	JPNUS(SGP)	0.082*** (0.010)	EXP_JPN	-0.211 (0.214)
JPNTHA	0.016 (0.049)	JPNUS(THA)	0.024*** (0.009)	EXVOL_US	-1,877.750 (8,295)
JPNIDN	0.029 (0.050)	JPNUS(IDN)	-0.003 (0.009)	INF_THD	-0.122 (1.078)
JPNPHL	0.165* (0.094)	JPNUS(PHL)	-0.023*** (0.008)	INF_US	-1,399.770 (1,581)
JPNMAL	0.734*** (0.038)	JPNUS(MAL)	0.053*** (0.010)	NY_THD	0.000 (0.004)
JPNCAN	-2.236*** (0.036)	JPNUS(CAN)	0.272*** (0.006)	NY_US	-0.048*** (0.018)
JPNMEX	0.945*** (0.087)	JPNUS(MEX)	0.030*** (0.006)	NY_JPN	0.002 (0.003)
JPNBRA	-0.085 (0.128)	JPNUS(BRA)	0.005 (0.006)	TRADEINT2_US	-4,990.010 (5,308)
JPNARG	0.000 (0.494)	JPNUS(ARG)	0.002 (0.009)	TRADEINT2_JPN	1,932.610 (4,356)
JPNFRA	0.090 (0.078)	JPNUS(FRA)	0.015*** (0.006)	IMP_WORLD_THD	0.007 (0.029)
JPNGER	0.003 (0.023)	JPNUS(GER)	0.090*** (0.006)	IMP_WORLD_US	0.166*** (0.063)
JPNITA	0.019 (0.103)	JPNUS(ITA)	0.018*** (0.006)	IMP_WORLD_JPN	-0.035 (0.044)
JPNUK	0.032 (0.041)	JPNUS(UK)	0.039*** (0.006)	EXP_WORLD_THD	0.024 (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.

Table 8: Panel Estimates with Heterogenous Coefficients (16 Countries)

NOB= 62860

SSR = .153418*10¹⁵Adj.R²= .494 (0.4939)

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

Note: standard deviations are in parentheses

Table 9: Panel Estimates with Heterogenous Coefficients (16 Countries)

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

NOB= 62860

SSR= 1.53232*10¹⁴

Adj.R²= .494 (0.4943)

Table 10: Country Characteristics as Interaction terms (16 Countries, all commodities)

<i>Macro variables</i>	EXVOL_US	EXVOL_JPN	INF_THD	INF_US	INF_JPN
JPNTHIRD	0.115*** (0.013)	0.066*** (0.017)	0.100*** (0.011)	0.468*** (0.049)	0.179*** (0.012)
JPNUS	0.127*** (0.002)	0.160*** (0.003)	0.107*** (0.002)	0.101*** (0.010)	0.117*** (0.002)
Z*JPNTHIRD	-0.809*** (0.314)	0.725** (0.356)	0.000 (0.000)	-0.132*** (0.017)	-0.161*** (0.011)
Z*JPNUS	-1.029*** (0.061)	-1.491*** (0.067)	0.000*** (0.000)	0.001 (0.004)	-0.033*** (0.002)
Adjusted R ²	0.05	0.05	0.05	0.05	0.06

	RYPC_THD	RYPC_US	RYPC_JPN	NY_THD	NY_US	NY_JPN
JPNTHIRD	0.463*** (0.021)	-1.837*** (0.153)	-4.432*** (0.358)	0.266*** (0.015)	-0.828*** (0.071)	-1.317*** (0.104)
JPNUS	0.057*** (0.003)	-0.767*** (0.030)	-1.120*** (0.072)	0.098*** (0.003)	-0.278*** (0.014)	0.293*** (0.022)
Z*JPNTHIRD	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Z*JPNUS	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000* (0.000)	0.000*** (0.000)	0.000*** (0.000)
Adjusted R ²	0.06	0.06	0.06	0.05	0.06	0.05

<i>Trade Variables (Total Value)</i>	IMP_WORLD_THD	IMP_WORLD_US	IMP_WORLD_JPN	EXP_WORLD_THD	EXP_WORLD_US	EXP_WORLD_JPN
JPNTHIRD	0.426*** (0.019)	-0.441*** (0.043)	-1.147*** (0.070)	0.345*** (0.017)	-0.867*** (0.058)	-1.751*** (0.103)
JPNUS	0.041*** (0.003)	-0.132*** (0.009)	0.116*** (0.015)	0.050*** (0.003)	-0.097*** (0.012)	-0.075*** (0.023)
Z*JPNTHIRD	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Z*JPNUS	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Adjusted R ²	0.06	0.06	0.05	0.06	0.06	0.05

<i>Trade Variables (Bilateral)</i>	IMP_US	IMP_JPN	EXP_US	EXP_JPN
JPNTHIRD	0.713*** (0.015)	-0.451*** (0.030)	0.676*** (0.015)	0.025 (0.017)
JPNUS	-0.031*** (0.003)	0.068*** (0.003)	-0.024*** (0.003)	0.106*** (0.003)
Z*JPNTHIRD	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Z*JPNUS	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000 (0.000)
Adjusted R ²	0.15	0.06	0.14	0.05

	TRADEINT1_US	TRADEINT1_JPN	TRADEINT2_US	TRADEINT2_JPN
JPNTHIRD	-2.686*** (0.063)	1.757*** (0.092)	-3.646*** (0.086)	2.099*** (0.128)
JPNUS	0.594*** (0.008)	0.235*** (0.011)	0.774*** (0.011)	0.360*** (0.015)
Z*JPNTHIRD	-0.760*** (0.017)	0.464*** (0.025)	-0.721*** (0.016)	0.392*** (0.025)
Z*JPNUS	0.134*** (0.002)	0.030*** (0.003)	0.129*** (0.002)	0.043*** (0.002)
Adjusted R ²	0.11	0.05	0.11	0.06

Table 11: Country Characteristics as Interaction terms (16 Countries, all commodities)

Ordinary Least Squares w/CD 12macro				Ordinary Least Squares w/CD 17macro					
Number of observations: 62860				Number of observations: 62860					
Std. dev. of dep. var.	73242.5	Durbin-Watson	1.1203 [0.000,000]	Std. dev. of dep. var.	73242.5	Durbin-Watson	1.16379 [0.000,000]		
R-squared	0.169769	Schwarz B.I.C.	787707	R-squared	0.224118	Schwarz B.I.C.	785634		
Adjusted R-squared	0.169227	Log likelihood	-787475	Adjusted R-squared	0.223488	Log likelihood	-785347		
Variable	Estimated Coefficient	Standard Error	t-statistic	P-value	Variable	Estimated Coefficient	Standard Error	t-statistic	P-value
JPNTTHIRD	-7.6565	1.29047	-5.93312	[.000]	JPNTTHIRD	-6.21719	1.2749	-4.87661	[.000]
JPNUS	5.88104	0.226013	26.0208	[.000]	JPNUS	5.26668	0.221163	23.8136	[.000]
J3EXVOL_US	-5.40866	0.368696	-14.6697	[.000]	J3EXVOL_US	-20.3012	1.28998	-15.7376	[.000]
J3INF_THD	1.20E-05	1.66E-04	0.072354	[.942]	J3EXVOL_JPN	16.949	1.48663	11.401	[.000]
J3INF_US	-0.05786	0.055535	-1.04186	[.297]	J3INF_THD	-4.25E-04	1.64E-04	-2.58591	[.010]
J3INF_JPN	-1.53E-03	0.035698	-0.04281	[.966]	J3INF_US	-0.386695	0.059039	-6.54981	[.000]
J3NY_THD	3.84E-07	6.37E-08	6.02065	[.000]	J3INF_JPN	0.160532	0.035266	4.55208	[.000]
J3NY_US	1.14E-06	2.61E-07	4.35958	[.000]	J3NY_THD	-1.03E-06	7.87E-08	-13.0821	[.000]
J3NY_JPN	-6.16E-07	1.17E-07	-5.26049	[.000]	J3NY_US	-2.74E-07	2.67E-07	-1.02672	[.305]
J3IMP_WORLD_US	-8.38E-06	1.56E-06	-5.37339	[.000]	J3NY_JPN	2.95E-07	1.17E-07	2.51846	[.012]
J3EXP_WORLD_THD	-1.10E-06	3.19E-07	-3.43736	[.001]	J3IMP_WORLD_US	2.36E-06	1.60E-06	1.47352	[.141]
J3EXP_WORLD_JPN	1.74E-05	1.70E-06	10.2724	[.000]	J3EXP_WORLD_THD	4.16E-06	3.81E-07	10.9354	[.000]
J3TRADEINT1_US	-0.806814	0.020593	-39.1795	[.000]	J3EXP_WORLD_JPN	-6.65E-06	1.87E-06	-3.5599	[.000]
J3TRADEINT1_JPN	0.48011	0.027979	17.1593	[.000]	J3IMP_US	3.45E-05	2.62E-06	13.1816	[.000]
JUEXVOL_US	-1.20413	0.067061	-17.9557	[.000]	J3IMP_JPN	5.85E-05	3.29E-06	17.8003	[.000]
JUINF_THD	5.96E-05	8.55E-06	6.97147	[.000]	J3EXP_US	-4.17E-05	1.87E-06	-22.3721	[.000]
JUINF_US	-0.214726	0.010362	-20.7222	[.000]	J3EXP_JPN	7.70E-05	4.07E-06	18.9329	[.000]
JUINF_JPN	0.101113	6.37E-03	15.8797	[.000]	J3TRADEINT1_US	-0.619884	0.058474	-10.601	[.000]
JUNY_THD	-1.59E-07	1.02E-08	-15.4974	[.000]	J3TRADEINT1_JPN	-1.38003	0.076867	-17.9535	[.000]
JUNY_US	-1.19E-06	4.66E-08	-25.6301	[.000]	JUEXVOL_US	0.856516	0.189706	4.51497	[.000]
JUNY_JPN	4.30E-07	1.95E-08	22.034	[.000]	JUEXVOL_JPN	-1.81159	0.223387	-8.10963	[.000]
JUIMP_WORLD_US	8.48E-06	2.89E-07	29.377	[.000]	JUINF_THD	6.28E-05	8.43E-06	7.44877	[.000]
JUEXP_WORLD_THD	6.19E-07	5.09E-08	12.1732	[.000]	JUINF_US	-0.230045	0.010418	-22.0806	[.000]
JUEXP_WORLD_JPN	-1.04E-05	3.09E-07	-33.6572	[.000]	JUINF_JPN	0.088787	6.26E-03	14.1883	[.000]
JUTRADEINT1_US	0.110902	2.57E-03	43.1121	[.000]	JUNY_THD	-4.67E-08	1.26E-08	-3.71618	[.000]
JUTRADEINT1_JPN	-0.015084	3.12E-03	-4.83167	[.000]	JUNY_US	-1.30E-06	4.58E-08	-28.464	[.000]
CD1	12477.7	883.325	14.1258	[.000]	JUNY_JPN	4.43E-07	1.92E-08	23.0313	[.000]
CD2	1696.86	888.12	1.91062	[.056]	JUIMP_WORLD_US	8.98E-06	2.84E-07	31.6558	[.000]
CD3	-824.211	958.263	-0.86011	[.390]	JUEXP_WORLD_THD	3.98E-07	6.42E-08	6.19508	[.000]
CD4	670.852	1246.94	0.537997	[.591]	JUEXP_WORLD_JPN	-1.11E-05	3.12E-07	-35.4824	[.000]
CD5	749.61	1200.65	0.624335	[.532]	JUIMP_US	1.42E-05	3.44E-07	41.1181	[.000]
CD6	-1566.6	1662.34	-0.94241	[.346]	JUIMP_JPN	1.43E-06	4.92E-07	2.90323	[.004]
CD7	2593.02	1577.36	1.64389	[.100]	JUEXP_US	-5.38E-06	2.58E-07	-20.7964	[.000]
CD8	5803.52	1432.63	4.05094	[.000]	JUEXP_JPN	8.23E-06	5.76E-07	14.2947	[.000]
CD9	12674.5	942.431	13.4487	[.000]	JUTRADEINT1_US	-0.229181	6.48E-03	-35.367	[.000]
CD10	19091.3	1162.78	16.4186	[.000]	JUTRADEINT1_JPN	0.055498	5.38E-03	10.3131	[.000]
CD11	-289.256	1280.56	-0.22588	[.821]	CD1	13577.8	856.672	15.8495	[.000]
CD12	46.5033	2283.05	0.020369	[.984]	CD2	1340.61	859.082	1.56052	[.119]
					CD3	-550.765	927.548	-0.593787	[.553]
					CD4	751.302	1206.74	0.622588	[.534]
					CD5	885.435	1162.01	0.761984	[.446]
					CD6	-2751.96	1610.59	-1.70866	[.088]
					CD7	1579.12	1526.75	1.0343	[.301]
					CD8	6186.5	1386.88	4.46072	[.000]
					CD9	12217.8	911.7	13.4011	[.000]
					CD10	17622.6	1125.7	15.6547	[.000]
					CD11	388.387	1238.16	0.31368	[.754]
					CD12	-3322.11	2210.31	-1.50301	[.133]

Table 12: Combined effect of interaction terms with mean value simulation

	China	Korea	Hong Kong	Singapore	Thailand	Indonesia	Philippine	Malaysia	Canada	Mexico	Brazil	Argentina	France	Germany	Italy	UK
Net effect of JPNTHIRD	0.083	0.120	0.466	0.174	0.641	0.792	0.490	0.346	-1.573	-1.647	-0.047	0.263	0.097	0.019	0.066	-0.212
JPNTNTHIRD	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657	-7.657
Combined effect of interaction terms	7.739	7.776	8.123	7.830	8.298	8.449	8.146	8.003	6.083	6.009	7.609	7.920	7.753	7.675	7.722	7.444
J3EXVOL_US	-0.072	-0.125	-0.131	-0.060	-0.106	-0.259	-0.096	-0.095	-0.054	-0.139	-0.237	-0.064	-0.004	-0.126	-0.130	-0.114
J3INF_THD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.000	0.000
J3INF_US	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162
J3INF_JPN	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
J3NY_THD	0.276	0.154	0.053	0.029	0.051	0.063	0.026	0.030	0.230	0.153	0.230	0.100	0.533	0.803	0.436	0.460
J3NY_US	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737	8.737
J3NY_JPN	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714	-2.714
J3IMP_WORLD_US	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765	-6.765
J3EXP_WORLD_THD	-0.261	-0.123	-0.061	-0.088	-0.057	-0.052	-0.027	-0.086	-0.215	-0.099	-0.054	-0.023	-0.290	-0.512	-0.224	-0.251
J3EXP_WORLD_JPN	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452	7.452
J3TRADEINT1_US	2.672	2.853	3.442	3.126	3.585	3.928	3.836	3.327	1.531	1.974	3.486	4.402	3.101	2.806	3.373	2.765
J3TRADEINT1_JPN	-1.422	-1.530	-1.727	-1.724	-1.723	-1.777	-2.139	-1.719	-1.955	-2.427	-2.369	-3.041	-2.134	-1.842	-2.280	-1.962
Net effect of JPNUS	0.168	0.107	0.038	0.121	0.022	-0.065	-0.004	0.085	0.338	0.240	-0.017	-0.078	0.057	0.075	-0.002	0.081
JPNUUS	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881	5.881
Combined effect of interaction terms	-5.713	-5.774	-5.843	-5.760	-5.859	-5.946	-5.885	-5.796	-5.543	-5.641	-5.898	-5.959	-5.824	-5.806	-5.883	-5.800
J3EXVOL_US	-0.016	-0.028	-0.029	-0.013	-0.024	-0.058	-0.021	-0.021	-0.012	-0.031	-0.053	-0.014	-0.001	-0.028	-0.029	-0.025
J3INF_THD	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.033	0.001	0.000	0.000	0.000	0.000
J3INF_US	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602	-0.602
J3INF_JPN	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084	0.084
J3NY_THD	-0.114	-0.064	-0.022	-0.012	-0.021	-0.026	-0.011	-0.012	-0.095	-0.063	-0.095	-0.041	-0.220	-0.332	-0.180	-0.190
J3NY_US	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180	-9.180
J3NY_JPN	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895	1.895
J3IMP_WORLD_US	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848	6.848
J3EXP_WORLD_THD	0.148	0.070	0.035	0.049	0.032	0.029	0.015	0.049	0.121	0.056	0.030	0.013	0.164	0.290	0.126	0.142
J3EXP_WORLD_JPN	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455	-4.455
J3TRADEINT1_US	-0.367	-0.392	-0.473	-0.430	-0.493	-0.540	-0.527	-0.457	-0.210	-0.271	-0.479	-0.605	-0.426	-0.386	-0.464	-0.380
J3TRADEINT1_JPN	0.045	0.048	0.054	0.054	0.054	0.056	0.067	0.054	0.061	0.076	0.074	0.096	0.067	0.058	0.072	0.062