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Japanese Trading Companies' Foreign Direct Investment
and
Japanese Food Import

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Abstract

The purpose of this paper is to quantitatively analyze the role of Japanese general trading companies in Japanese food import. Japan's general trading companies, which are called shosha, have played a variety of functions in procurement, logistics, and sales of food in Japan. The regression analysis shows that the number of food-related foreign direct investment by the trading companies has a positive impact on food imports, which is four times as much as the impact of investment by the general food industry.

Keywords: trading companies, foreign direct investment, food trade, Japan

Introduction

The purpose of this paper is to quantitatively analyze the role of Japanese general trading companies in Japanese food import. Japan's general trading companies, which are called *shosha*, have played a variety of functions in procurement, logistics, and sales of food in Japan. Mikamo and Kawashima (2009) divided the role of general trading companies into three functions: procurement functions, logistics functions, and sales functions. The procurement function is a function to collect commodities from major multinational grain firms and to produce other agricultural commodities. The distribution function is the reduction of transportation costs and management of storage facilities. The sale function utilizes the domestic value chain to expand overseas markets. Each of these functions of general trading companies has a major impact on food imports to Japan. However, Mitsubishi Corporation, Horiguchi and Sasakura (2011) note that the role of the *shosha* has switched to positive international business investment from trading alone. In this paper, we verify quantitatively the impact of the activities of general trading companies on food imports in recent years.

Investment situation of general trading companies

First of all, we compare the amount of sales of the seven major Japanese *shosha* in the food sector (see names below). Figure 1 shows the component percentages of consolidated performance for the business term ending in March for the years from 2007 to 2009 of the major Japanese *shosha*; the components are grains, oils and fats; livestock feed; sugar; fish products; and other food products. As seen in Figure 1, the sales of food departments in Mitsubishi Corporation, Itochu Corporation, and Mitsui & Co. mainly derive from other food products. However, there is no information for Toyota Tsusho Corporation. The sales of food departments in Sumitomo Corporation and Sojitz Corporation mainly derive from grains, oils and fats. Finally, the income of food departments in Marubeni Corporation in 2007 and 2008 was from livestock feed; however the share of grains, oils and fats became the main source of income in 2009.

[Figure 1]

Since the late 1980s, foreign direct investment (FDI) by Japanese food companies has been rapidly expanding, especially in East and Southeast Asia. We use the 2003 and 2010 versions of *Kaigai Shinshutsu Kigyō Souran* (“List of Japanese Affiliates in Foreign Countries”; Toyokeizai 2003 and Toyokeizai 2010) to capture FDI in 2002 and 2009 of seven major

shosha. From this data, we can analyze data from the companies surviving at the time of the survey. This study analyzes the number of existing cases of FDI in the categories of “agriculture, forestry and fisheries,” “manufacture of food,” and “wholesale of food.” However we remove forestry FDI from “agriculture, forestry and fisheries” because forestry products are not used as food. In addition, 2002 data for Sojitz include data for the companies Nissho Iwai and Nichimen, which merged into Sojitz in 2004.

Figure 2 shows the breakdown of the number of FDI by company. From Figure 2, it is clear that every *shosha* has invested across the whole supply chain, which includes “agriculture and fisheries,” “manufacture of food,” and “wholesale of food.” This means the *shosha* are actively involved in the whole process of food distribution, upstream to downstream. In addition, if we look at the changes from 2002 to 2009, we see that *shosha* reduced the proportion of FDI in “agricultural and fisheries,” and concentrated more on downstream. Moreover, if we focus on the absolute number of FDI, only Mitsui and Itocho can be seen to increase food-related FDI over these years. Also, all seven companies reduced the number of FDI in “agriculture and fisheries.”

[Figure 2]

Next, we will look at the relationships between controlling share, sales, and capital, in order to understand the food-related FDI activities of each trading company. Also, with respect to controlling share and amount of sales, the average of existing data is used in the following analysis though not all FDI cases have data.

Figures 3 and 4 show the number of cases of FDI, the controlling share of all Japanese companies including *shosha*, the controlling share of *shosha* only, the controlling share within Japanese companies of *shosha*, the ratio of annual sales, and capital for food-related FDI invested totally or partially by general *shosha*. The x-axis of Figure 3 is divided by the seven major Japanese *shosha*, and the x-axis of Figure 4 is divided by FDI region.

Figure 3 shows that although the controlling share of the seven major *shosha* does not exceed 50%, they often keep controlling share within Japanese companies over 50%. In addition, their controlling share within Japanese companies increased from 2002 to 2009. That is, for food-related FDI the *shosha* often hold the leadership in Japanese side. Moreover, the ratio of the amount of year sales and the capital of seven major Japanese *shosha* increased from 2002 to 2009. This suggests that profitability was increasing.

[Figure 3]

Figure 4 shows food-related FDI in different areas that is invested totally or partially by

shosha. The most FDI by region is seen in Asia. However, controlling share of *shosha* and controlling share of *shosha* within Japanese companies are lower in Asia than in other region, with the exception of Africa. *Shosha* hold the leadership in areas more distant than Asia, such as North America, Oceania, and South America. Further, the controlling share of *shosha* in North America and Asia increased from 2002 to 2009, and ratio of annual sales and food-related FDI capital increased from 2002 to 2009 in most regions. This suggests that profitability was increasing, although some data is unavailable.

[Figure 4]

Quantitative analysis and data

Some previous studies have analyzed the relationship between food imports and FDI in Japan, such as Kiyota and Urata (2003) and Sattaphon and Kiminami (2006). These papers use the following gravity models to confirm a positive correlation between food imports and FDI.

$$\ln(import) = \beta_0 + \beta_1 \ln(GDP) + \beta_2 \ln(GDP \text{ per capita}) + \beta_3 \ln(distance) + \beta_4 \ln(FDIstock) + \varepsilon \dots \dots \dots (1)$$

Here, *import* is food imports, *GDP* is the gross domestic product of the exporting country, *GDP per capita* is the per capita GDP of the exporting country, *distance* is the distance between Japan and the exporting country, and *FDIstock* is cumulative Japanese FDI in a certain period. However, using the cumulative value of FDI means the impact of the previous period's FDI is ignored. Therefore, in this study, we use the number of surviving investment companies given in *Kaigai Shinshutsu Kigyo Souran* (Toyokeizai, 2003 and Toyokeizai, 2010) in place of FDI stock. The following is the estimation equation of this study.

$$\ln(import) = \beta_0 + \beta_1 \ln(GDP) + \beta_2 \ln(distance) + \beta_3 \ln(farmland_per\ capita) + \beta_4 (shosha_foodFDI) + \varepsilon \dots \dots \dots (2)$$

Here, *import* is food imports, *GDP* is gross domestic product of the exporting country, *distance* is the distance between Japan and the exporting country, *farmland_per capita* is the amount of farmland per capita, and *shosha_foodFDI* is the number of existing cases of food-

related *shosha* FDI. The gravity model assumes that the amount of trade is determined by the distance between the two countries and by some social conditions. Since the interest of this study is limited to the amount of food imports to Japan, the size of the Japanese is not used as an explanatory variable. In addition, in order to compare the effects of all food-related FDI and food-related FDI by *shosha*, another estimation, replacing *shosha_foodFDI* by *total number of food-related FDI*, is also needed. The variables are taken by a natural logarithm, adding 1 to all variables before taking the logarithm.

The source of the data is as follows. First, food-import data for the explained variable are aggregated based on JETRO Japanese Trade Statistics Database. Also, we use seven categories of total food imports—meat; fish and shellfish; vegetables and fruits; raw and processed grain; coffee, tea, and spices; processed foods; and other animal and vegetable products—as the other explained variables (see the Appendix for the details). GDP and population data is from the World Data Bank; farmland is from “Agricultural area” in FAOSTAT, and distance was calculated as straight distance between Tokyo and the capital city of the exporting country. The items *shosha_foodFDI* and *total number of food-related FDI* of food-exporting countries are extracted from *Kaigai Shinshutsu Kigyo Souran*. All data are taken at two points in time: 2002 and 2009. The subjects of analysis are those countries that export food to Japan.

Table 1 shows the estimation results when the explained variable is total food-import volume. In the OLS estimation, the number of food-related *shosha* FDI, *shosha_foodFDI*, has a positive and significant impact on food imports, with a coefficient about quadruple that of *total number of food-related FDI*. The coefficients of farmland area per capita and GDP of exporting countries is significantly positive. However, the coefficient of the 2009 dummy is not significant. In the Random Effect Panel estimation, the number of food-related *shosha* FDI, *shosha_foodFDI*, has a positive and significant impact on food imports, with a coefficient about quadruple that of *total number of food-related FDI*, which is not significant here. Also, the coefficient of GDP of exporting countries is significantly positive and the coefficient of the 2009 dummy is not significant. The sign of the coefficient of distance and the coefficient of farmland area per capita of exporting countries are as expected but not significant here. The results were also analyzed by region, showing that the coefficient of food-related FDI is significant only in Asia and the coefficient of distance is significant only between Japan and Europe. The coefficient of farmland per capita is not significant globally, but it is significant in Asia, America and Oceania.

[Table 1]

Next, we estimate the effects of the different classification of imported food; the results are shown in Table 2. As a result, regardless of the type of food, the coefficient of food-related FDI by category is about four times the coefficient of *total number of food-related FDI*. The ranking of the effect of food-related FDI on food imports is 1) raw and processed grain; 2) coffee, tea, and spices; 3) meat; 4) fish and shellfish; 5) vegetables and fruits; 6) processed foods; 7) other animal and vegetable products. However, only the upper three are significant. From this result, we see that *shosha* play an important role in imports of grain; coffee, tea, and spices; and meat. In addition, the effect of the GDP of exporting countries is positive and significant for all type of food imports. Farmland area per capita has a positive and significant impact on grain and meat only, which shows that farmland endowment has a positive impact on exports of land-extensive agricultural products.

[Table 2]

Finally, we multiply the 2009 dummy variable and each explanatory variable and add them as explanatory variables in order to verify the role of the *shosha* in 2002 and 2009. If the multiplied variable is significant, the explanatory variable changes its role by 2009. Table 3 shows the results. The imports of raw and processed grain; coffee, tea, and spices; and meat which are influenced significantly by *shosha* in both Table 2 and Table 3, are also influenced significantly in Table 3. However, the explanatory variables are not significant for the cross term with 2009 dummy. In other words, the role of *shosha* in food imports showed no change from 2002 to 2009.

[Table 3]

Conclusion

In this quantitative study of the role of the Japanese general trading companies or *shosha* in food import to Japan, we see first that the characteristics of food-related FDI by *shosha* are as follows. 1) FDI is mainly led by the Japanese side, where *shosha* play the main role. 2) FDI is mainly in Asia but is spread throughout the world. 3) The investment is from upstream to downstream, but the number of investment upstream is decreasing. 4) Profitability is enhanced by investment. As well, from the regression analysis of the gravity model, the number of food-related FDI by *shosha* is seen to have a positive impact on food imports that is four times as much as the impact of general food FDI. That is, there is a closer relationship between food imports and food-related FDI by *shosha*. Furthermore, by classifying different types of food imports, it was seen that food-related FDI by *shosha* has a positive and

significant impact on imports of raw and processed grain; coffee, tea, and spices; and meat. This shows that when these products are imported to Japan, the food-trading sections of *shosha* played an important role. Finally, we see that the role of *shosha* in food imports between 2002 and 2009 did not change.

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Appendix

The classification of import foods in the trade statistics of JETRO is as follows.

Meat: edible meat, edible offal

Fish and shellfish: living fish, fresh or refrigerated or frozen fish, fish liver, fish eggs, dried or salted or pickled or smoked fish, crustaceans (shrimp, crab, lobster), mollusks (oysters, squid, octopus, snails, shellfish)

Vegetables and fruits: edible vegetables, cassava potato, sweet potato, edible fruit or nuts, rinds of citrus fruits

Grain and processed grain: wheat, rice, barley, naked barley, other cereals, wheat flour, potato flour, other flour, dried bean powder, malt, starches, inulin, wheat gluten

Coffee, tea, spices: coffee, green tea, black tea, yerba mate, black pepper, red pepper, other

spices

Processed foods: fruit preserves, processed vegetables, processed meat and fish, juices, various sugars, various confectionary, various alcoholic beverages, tobacco, mineral water, pasta, yeast

Other animal and vegetable products: live animals, dairy products, eggs, honey, non-edible meat offal, various kinds of lees, livestock feed.

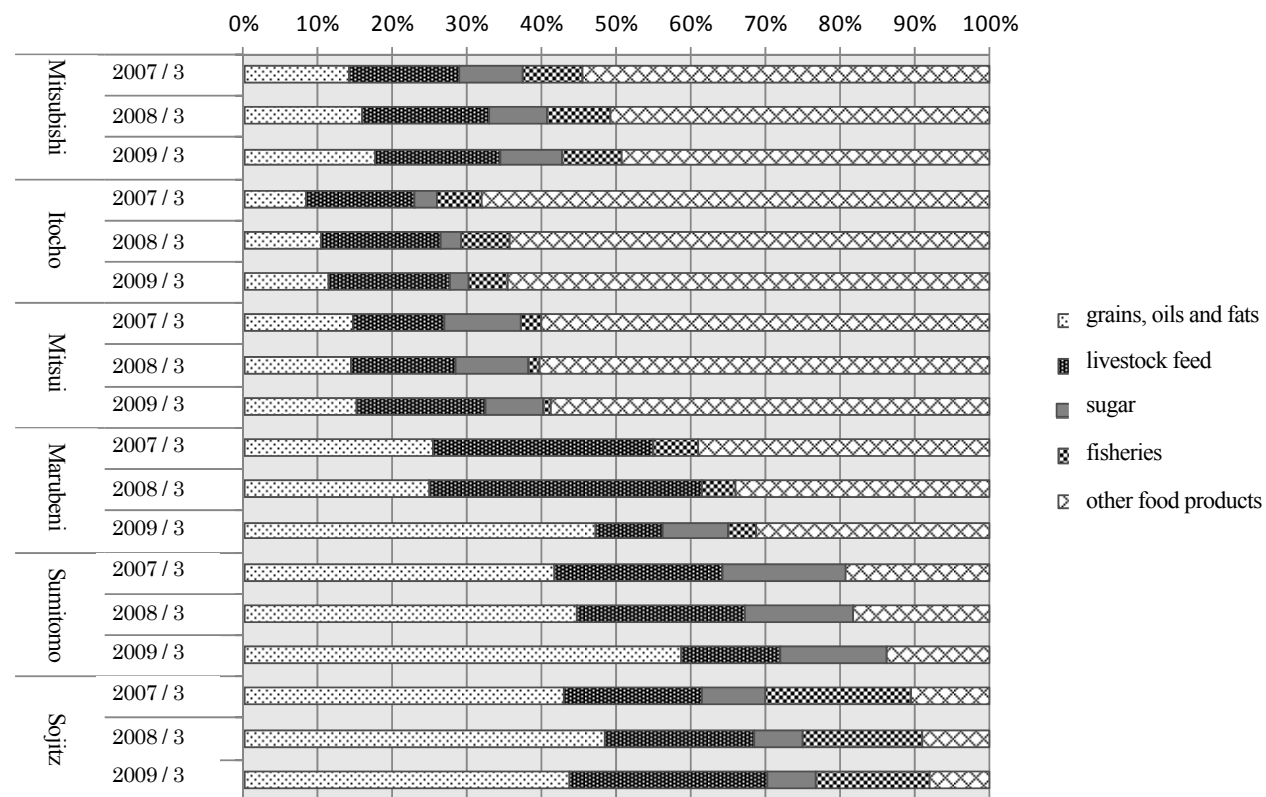


Figure 1. The component percentages of consolidated performance of major Japanese *shosha*'s food sector for the business term ending in March for years 2007, 2008, 2009

Notes : The “food products” of Sumitomo Corporation includes “fisheries”. From 2009, the “grains, oils and fats” of Sumitomo Corporation starts to

include the “livestock feed”. There are no information about Toyota Tsusho Corporation

Data sources: *Brains*, No.1767(2008.7.23) and No.1815(2009.7.22), Brains, Inc.

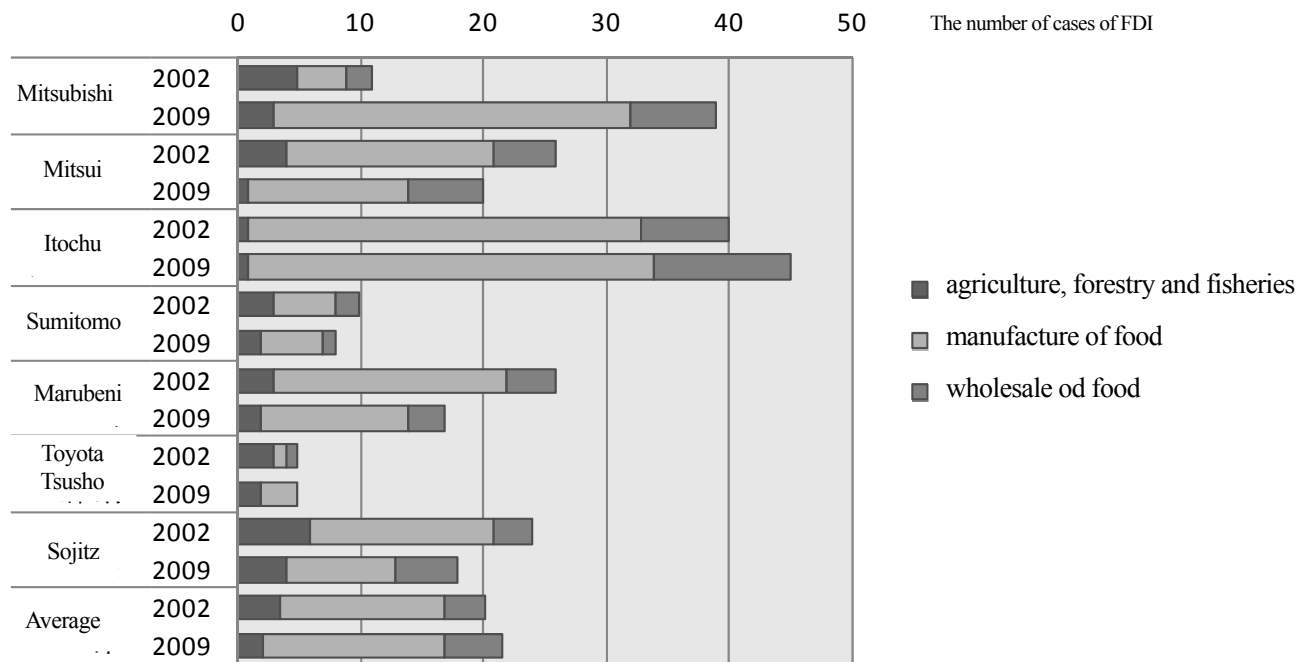


Figure 2. The breakdown of food-related FDI by each Japanese *Shosha*
 Data sources: version 2003 and 2010 of *Kaigai Shinshutsu Kigyo Soran*

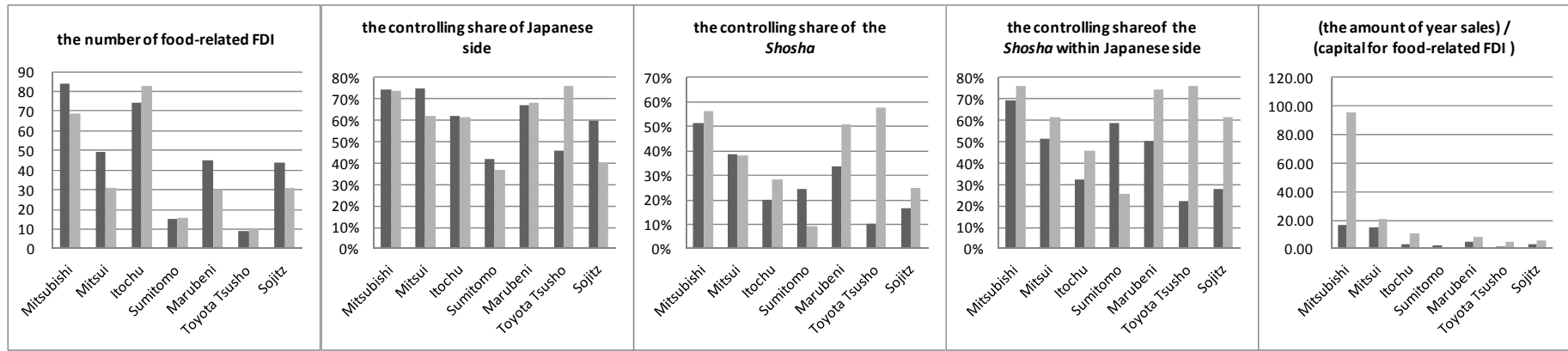


Figure 3. The characteristic of food-related FDI by trading companies in 2002 and 2009
 Notes: The dark gray represents the data of 2002; the light gray represents the data of 2009

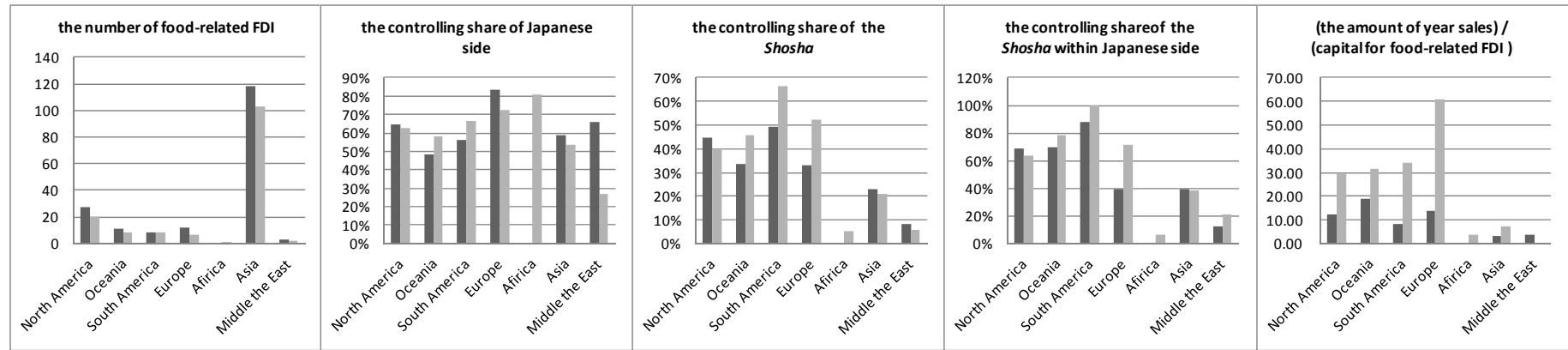


Figure 4. The characteristic of food-related FDI by trading companies in different regions (the average value of seven *Shosha*)
 Notes: The dark gray represents the data of 2002; the light gray represents the data of 2009

Table 1. The estimation results of total food imports to Japan

dependent variable: the value of imported total food (log)	OLS estimation				Panel estimation(Random Effect)(Note 2)									
	World		World		Aisa		Africa		Europe		America		Oceania	
2009 year dummy	-0.29	-0.30	-0.28	-0.30	-0.21	-0.28	0.09	0.25	-0.35*	-0.35*	-0.29	-0.29	-0.79	-0.78
ln(GDP)	1.06***	1.05***	1.04***	1.04***	0.97***	1.00***	1.10**	0.96**	0.93***	0.88***	1.15***	1.10***	0.72**	0.76*
ln(farmland_per capita)	0.11	0.12	0.09	0.09	-0.61***	-0.60***	0.37	0.35	0.42	0.45	0.70**	0.70**	1.04*	1.08*
the number of shosha_food FDI	0.08**		0.088*		0.089*		-0.45		0.16		0.19		-0.26	
total number of food-related FDI		0.02**		0.02		0.02		1.45		0.08		0.10		-0.08
ln(distance)	-0.48	-0.54	-0.45	-0.53	-0.93	-1.03	-3.98	-4.69	5.363*	5.21*	0.76	0.55	0.19	0.25
Constant	13.66***	14.27***	13.56***	14.35***	21.17**	22.00**	44.16	51.13	-40.88	-39.52	-1.79	0.26	5.62	4.82
the number of samples(2002 and 2009)	304	304	304	304	72	72	76	76	78	78	66	66	18	18

(Note 1) *** is significance level 1%; ** is significance level 5%; * is significance level 10%.

(Note 2) From Hausman test, the Random Effect estimation is adopted. Also, from Breusch-Pagan test, random effect estimation is more proper than OLS pooling estimation.

Table 2. The estimation of the different classification of imported food to Japan

Imported items (log)	total food		meat		fish and shellfish		vegetables and fruits	
2009 year dummy	-0.281	-0.298	-1.316 ^{***}	-1.341 ^{***}	-1.606 ^{***}	-1.610 ^{***}	-1.248 ^{***}	-1.262 ^{***}
ln(GDP)	1.042 ^{***}	1.038 ^{***}	1.516 ^{***}	1.489 ^{***}	1.174 ^{***}	1.139 ^{***}	1.886 ^{***}	1.875 ^{***}
ln(farmland_per capita)	0.0898	0.0931	0.532 ^{**}	0.535 ^{**}	0.148	0.146	0.134	0.136
the number of shosha_food FDI	0.0878 [*]		0.182 ^{**}		0.115		0.0939	
total number of food-related FDI		0.0186		0.0437 ^{**}		0.0329		0.0217
ln(distance)	-0.445	-0.531	-0.684	-0.802	-1.831	-1.848	-1.477	-1.548 [*]
Constant	13.56 ^{***}	14.35 ^{***}	1.748	2.914	21.52 ^{**}	21.77 ^{**}	12.71	13.40 [*]

Imported items (log)	raw and processed grain		coffee, tea, and spices		processed foods		other animal and vegetable products	
2009 year dummy	-0.334	-0.359	-0.790 ^{***}	-0.819 ^{***}	-1.079 ^{***}	-1.105 ^{***}	-1.486 ^{***}	-1.488 ^{***}
ln(GDP)	1.690 ^{***}	1.654 ^{***}	1.015 ^{***}	0.989 ^{***}	1.810 ^{***}	1.815 ^{***}	1.722 ^{***}	1.697 ^{***}
ln(farmland_per capita)	0.353 [*]	0.355 [*]	-0.271	-0.268	-0.0446	-0.0383	0.133	0.131
the number of shosha_food FDI	0.212 ^{***}		0.195 ^{**}		0.104		0.0735	
total number of food-related FDI		0.0527 ^{***}		0.0457 ^{**}		0.0194		0.0216
ln(distance)	-0.748	-0.866	-0.259	-0.4	0.0509	-0.0811	-1.274	-1.277
Constant	2.297	3.477	6.673	8.043	3.966	5.152	13.29 [*]	13.39 [*]

(Note 1) *** is significance level 1%; ** is significance level 5%; * is significance level 10%.

(Note 2) From Hausman test, the Random Effect estimation is adopted.

Table 3. The estimation of the different classification of imported food to Japan with variables which are multiplied by 2009 year dummy

Imported items (log)	total food		meat		fish and shellfish		vegetables and fruits	
<i>2009 year dummy</i>	-0.894	-0.887	-9.461	-11.05*	8.289	8.033	-8.756	-8.479
ln(GDP)	1.156***	1.152***	1.552***	1.501***	1.222***	1.202***	1.985***	1.980***
<i>2009 year dummy</i> · ln(GDP)	-0.187*	-0.195*	0.000366	-0.0255	-0.0779	-0.0907	-0.159	-0.171
ln(farmland_per capita)	0.177	0.181	0.551**	0.553**	0.0881	0.0923	0.287	0.29
<i>2009 year dummy</i> · ln(farmland_per capita)	-0.159	-0.163	-0.00661	-0.0243	0.11	0.102	-0.288*	-0.291*
the number of shosha_food FDI	0.0706		0.187**		0.118		0.0666	
<i>2009 year dummy</i> · the number of shosha_food FDI	0.0202		-0.0895		0.0045		0.0534	
total number of food-related FDI		0.0178		0.0582***		0.0329		0.0175
<i>2009 year dummy</i> · total number of food-related FDI		0.00196		-0.0193		-0.00246		0.00864
ln(distance)	-0.586	-0.645	-1.261	-1.3	-1.234	-1.301	-2.013**	-2.060**
<i>2009 year dummy</i> · ln(distance)	0.239	0.244	0.903	1.099	-1.129	-1.091	1.067*	1.043*
Constant	13.97**	14.51***	6.792	7.243	16.28	16.91	16.40*	16.82**
Imported items (log)	raw and processed grain		coffee, tea, and spices		processed foods		other animal and vegetable products	
<i>2009 year dummy</i>	-6.24	-6.371	5.885	6.091	-4.83	-4.649	-8.82	-8.485
ln(GDP)	1.534***	1.494***	1.192***	1.189***	1.897***	1.908***	1.692***	1.676***
<i>2009 year dummy</i> · ln(GDP)	0.271*	0.273*	-0.291**	-0.308**	-0.157	-0.168	0.0447	0.0393
ln(farmland_per capita)	0.318	0.326	-0.283	-0.272	-0.104	-0.0957	0.208	0.209
<i>2009 year dummy</i> · ln(farmland_per capita)	0.0618	0.0521	0.0282	0.0196	0.127	0.123	-0.151	-0.153
the number of shosha_food FDI	0.228***		0.173**		0.0856		0.0597	
<i>2009 year dummy</i> · the number of shosha_food FDI	-0.0232		0.0531		0.038		0.0472	
total number of food-related FDI		0.0638***		0.0417*		0.0168		0.0184
<i>2009 year dummy</i> · total number of food-related FDI		-0.0175		0.00417		0.00487		0.00633
ln(distance)	-0.995	-1.123	0.104	-0.0611	-0.136	-0.259	-1.691*	-1.705*
<i>2009 year dummy</i> · ln(distance)	0.508	0.532	-0.65	-0.66	0.379	0.365	0.883	0.851
Constant	5.221	6.448	2.914	4.376	5.792	6.863	16.74**	16.90**

(Note 1) *** is significance level 1%; ** is significance level 5%; * is significance level 10%.

(Note 2) From Hausman test, the Random Effect estimation is adopted.