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The Impact of FTAs on Procurement Behavior of Japanese Firms' Overseas Affiliates

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The Impact of FTAs on Procurement Behavior of Japanese Firms' Overseas Affiliates[1]

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Abstract

In Japan, the effect of free trade agreements (FTAs) has been argued in the discussion of the changes in the external and internal industrial structure. Japanese firms have formed sophisticated regional supply chain networks and increased overseas production over the last decades, with an aim of increasing their competitiveness in the global market. There are contrasting views on export expansion by FTAs in such regionalization and globalization of the Japanese industry. Some policymakers and researchers are concerned as FTAs would facilitate the hollowing out of the Japanese industry. Others argue that FTAs would prevent the hollowing out by increasing the role of the Japanese industry in the supply chains. This paper examines how FTAs affect the supply chains at the firm level by investigating the behavior of overseas affiliates of Japanese firms, and provides statistical evidence for this argument as well as draws implications for industrial policies. The findings indicate that FTAs contribute to the increase in the share of imports from Japan, particularly from their parent firm, to total procurement for the overseas affiliates of Japanese firms, suggesting that FTAs increase the significance of the Japanese industry in the supply chains and possibly have stopped/slowed down hollowing out.

Keywords: FTAs, Supply chains, Procurement behavior
JEL classification: F13, F14, F23

[1] This study is conducted as a part of the Project "A Study of Free Trade Agreements" undertaken at the Research Institute of Economy, Trade and Industry(RIETI).

1. Introduction

Free trade agreements (FTA), which eliminate import tariffs on trade among the FTA members, have become one of the most important and popular trade policy instruments, if not the most important and popular instrument, in recent decades. The cumulative number of regional trade agreements (RTAs), which include not only FTAs but also customs unions, reported to the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO), increased from 86 in 1990 to 266 in 2000, then to 659 in 2017[1].

While an increasingly large number of countries began to be engaged in RTAs, the countries in East Asia including Japan, China, and Korea were slow in adopting FTAs. It was in the early 2000s when these countries began to negotiate FTAs. Once they began to pursue FTAs, they became very active in establishing FTAs. Indeed, an FTA "race" emerged to result in the proliferation of FTAs in East Asia. For Japan, 15 FTAs including 14 bilateral FTAs with Singapore, Mexico, Malaysia, Australia, and others and one plurilateral FTA with the Association of Southeast Asian Nations (ASEAN), have been enacted as of July 2017. Japan is a signatory country of the Trans-Pacific Partnership (TPP) Agreement, which is currently under the ratification process by the member countries. Japan is the first member that ratified the TPP in December 2016. Japan is currently engaged in several FTA negotiations, which include the Regional Comprehensive Economic Partnership (RCEP) involving 16 East Asian countries, and Japan-EU (European Union) FTA.

Several motives can be identified for the establishment of FTAs. Export expansion, which would promote economic growth, is a major motive. This motive led to a rapid expansion of FTAs in the early 1990s, when the Uruguay Round, the last multilateral trade negotiations under the GATT, faced the deadlock because of the differences in the opinions about trade liberalization. Faced with the situation, many countries turned to FTAs to promote export. A similar situation emerged after the establishment of the WTO in 1995, resulting in the continued expansion of RTAs, as the first multilateral trade negotiation, or the Doha Development Agenda (DDA) that began in 2001 did not make much progress.

For Japan, export expansion through FTAs has been argued in the discussion of the changes in the external and internal industrial structures. Japanese firms' overseas operation has expanded rapidly since the mid-1980s, when the rapid and sharp appreciation of the yen reduced the competitiveness of Japanese exports in the

[1] As of 20 June, 2017. WTO RTA database accessed on 6 August, 2017. https://www.wto.org/english/tratop_e/region_e/regfac_e.htm

international market. The emergence of the bubble economy aided Japanese firms in establishing overseas affiliates. Japanese firms' overseas investment more or less continued to rise since the mid-1980s with some fluctuations. Indeed, the overseas production ratio (overseas sales/(overseas sales + domestic sales)) increased from 3.0 (8.7) percent in 1985 to 25.3 (38.9) percent in 2015 for all Japanese manufacturing firms (only those with overseas operation)[2]. A rapid increase in overseas production has been accompanied by the construction of sophisticated regional production networks that are thought to increase their competitiveness in the global market. Contrasting to such a positive view of an expansion of overseas production, many policy makers and business people are concerned as it would lead to the hollowing out of the Japanese industry. This is a particularly serious issue for the regional and rural economy. Some argue that FTAs would prevent the hollowing out by promoting exports and discouraging overseas production.[3]

In addition to the promotion of exports, promotion of structural reform such as reform of the agricultural sector has been indicated as a motive for establishing FTAs for Japan. Furthermore, the proliferation of FTAs has led Japanese firms to appeal to the Japanese government to establish FTAs, in order to overcome the disadvantageous position vis-à-vis foreign firms from the countries with FTAs, because FTAs are discriminatory framework favoring FTA members.

In light of these observations, the purpose of this paper is to analyze the impacts of FTAs on Japan's exports to FTA member countries. In particular, we examine how FTAs affect the supply chains at the firm level, to draw implications for the industrial policies such as prevention of the hollowing out of the Japanese industry. In order to achieve our objective, we examine the purchasing (procurement) patterns of intermediate inputs such as parts and components by overseas affiliates of the Japanese firms before and after the enactment of FTAs. Specifically, we focus on the ratio of imports from Japan (and parent firm in Japan) to overall purchase, which includes local procurement, imports from Japan as well as those from the rest of the world. We call these ratios "Japanese import ratio" and "parent import ratio", respectively. We hypothesize that the significance of the Japanese industry would increase if FTAs resulted in the increase in these import ratios, as overseas affiliates' imports from Japan (parent firm in Japan) are Japan's (parent firm's) exports, contributing to the expansion of production in Japan. It may also contribute to preventing hollowing out. A large number of studies have been conducted

[2] Ministry of Economy, Trade and Industry, *Basic Survey on Overseas Business Activities of Japanese Firms*, various issues.

[3] See, for example, Kwan (2012).

to examine the impacts of FTAs on trade by using trade statistics, but to the best of our knowledge, our study is the first one examining firm level transaction for Japan's FTAs. Our study therefore may shed light on a new aspect of the impacts of FTAs.

The remainder of the paper is organized as follows. Section 2 discusses the methodology of the analysis and the data used for the analysis. It also provides some basic information concerning the data. Section 3 presents and discusses the statistical analysis of the impacts of FTAs on the import ratios of overseas affiliates of the Japanese firms. Section 4 concludes the paper.

2. Methodology and Data

This section describes our empirical model and the data. Following many existing papers including Urata and Okabe (2014), we apply a gravity model to estimate the impacts of FTA on the importing and purchasing behavior of overseas affiliates of Japanese firms[4]. The gravity model hypothesizes that bilateral trade is determined by the magnitude of market size of the two countries and the distance between them. Specifically, bilateral trade is hypothesized to be positively related to the sum of two markets and negatively related to the distance. In our model we include an FTA dummy variable, in order to test the impact of FTA on import-purchasing behavior of the overseas affiliates of the Japanese firms. In addition, following the previous studies, we include control variables that are thought to affect trade flows such as exchange rates. Our model also includes several characteristics of overseas affiliates of Japanese firms because they vary considerably across the affiliates and give significant impacts on their purchasing/importing behaviors. Thus, our regression is as follows,

$$\frac{Imports_t}{Total\ \ Purchase_t} = \beta_0 + \beta_1 lnGDP_{it} + \beta_2 lnGDP_{jt} + \beta_3 lnEXR_{ijt} + \beta_4 lnDistance_{ij} + \sum_{h=1}^{n} \gamma_h X_h + \delta FTA_t + u_t$$

where EXR is the exchange rate index and X is a control variable. Subscripts, i and j represent the country where the affiliate is located and Japan, respectively[5]. X includes the status of the affiliates (STATUS), age (AGE), productivity (PROD) and size (SIZE).

[4] See Feenstra (2016) for an explanation of the gravity model and Baier and Bergstrand (2007) for the impacts of FTAs on foreign trade using the gravity model. For the study of the Japanese case, see, for example, Ando and Urata (2015).

[5] For simplicity, the subscript that represents individual firms is omitted.

The dependent variable is the ratio of imports from Japan (and the parent firm in Japan) to total purchase of the affiliates that is defined as imports (or imports from parent firm) / total purchase. An advantage of using those ratios is that they are not dependent on deflators. This is important because reliable trade deflators by country are not available. Our model is estimated by the Tobit method with both upper and lower cut points because the ratio falls between zero and unity. In this analysis, we would like to examine if FTAs have increased imports-total purchase ratio of the overseas affiliates of Japanese firms. Thus, we expect that the FTA dummy is positively estimated to provide an evidence to support the hypothesis that an FTA is an important trade policy for the Japanese firms to increase exports to their oversea affiliates and prevent the industrial hollowing-out.

Following the standard gravity model, we expect that distance has the negative sign. Unlike the gravity model, the signs of GDPi and GDPj seem ambiguous because GDP indicates the size of demand as well as supply. An increase in GDPi leads to an increase in demand for imports in country i, resulting in the increase in imports (or imports from parent firm) / total purchase. However, if an increase in GDP indicates the expansion of domestic supply capability, then an increase in GDPi would reduce the import ratio. The impact of GDPj, that is Japan's GDP, on the ratio is also ambiguous. If it represents the supply capability of Japan, then an increase in Japan's GDP would increase the import ratio for the overseas affiliates. However, an increase in Japan's GDP would reduce the import ratio, if GDP represents the size of demand. This is because an increase in Japan's demand is likely to reduce the supply capability of exports. For the analysis, it is desirable to use value added and/or sales value by sectors, but they are not used because of the difficulty in obtaining such information for the countries examined in the analysis.

Exchange rates (EXR) are expected to have positive coefficients because EXR is defined here to increase with the depreciation of the Japanese yen. The status of the affiliates is represented by the affiliate dummy that takes unity if the parent firm is a major equity holder and zero if a major equity holder is an overseas affiliate. We call the former type and the latter type of affiliate as first and second-generation affiliates, respectively. We expect that this variable has a positive coefficient because first-generation affiliates are generally less localized and more dependent on imports from Japan. Affiliate age is expected to be negative because affiliates with long period of operation tend to have developed local procurement network, thus rely less on imports from Japan. Productivity can take either positive or negative value. However, we expect the positive coefficient because productive firms need sophisticated imports from Japan in the regional production networks. The firm size is also expected to be negative because the large

affiliates tend to have long operation history and thus developed local procurement less network, resulting in low reliance on imports.

Our data of overseas affiliates of the Japanese firms are obtained from the Basic Survey on Overseas Business Activities compiled by the Ministry of Economy, Trade and Industry (METI)[6]. For the full period of our estimation, 1995-2013, this survey decomposed purchase of inputs and materials into three sources that include local procurement, imports from Japan, and imports from the rest of the world (ROW). For the recent period, 2009-2013, this survey includes the data on the imports from the Japanese parent firms. Affiliate's characteristics such as their status (first and second generation affiliates), age, productivity and size are also obtained from the same source. As we mentioned above, the status of affiliates is denoted as the affiliate dummy. Affiliate's age is calculated as follows, the present year – the year when the affiliates started operation. Productivity is labor productivity (Total sales / number of workers)[7]. And the firm size is the log of the number of workers. We classify the manufacturing sector into 11 subsectors, to control industrial specific characteristics. The list of the subsectors is shown in Appendix.

GDP and exchange rates are taken from the statistics of the United Nations Conference on Trade and Development (UNCTAD)[8]. Exchange rates are deflated by implicit GDP deflators. A problem using the UNCTAD data is that the UNCTAD data are compiled by the calendar year (January - December) while the METI data are reported by the Japanese fiscal year (April - March). This problem, however, does not seem to be serious because it takes some time for the firms to adjust their purchasing patterns following the changes in the market conditions. Data for the distance are available from CEPII,[9] and FTA information is obtained from the website of Japan's Ministry of Foreign Affairs[10].

Table 1 is the list of Japan's FTAs. As of the end of November 2016, Japan enacted 15 FTAs. It shows that Japan puts a priority on the Asia and the Pacific region in its FTAs. It should be noted that Japan's two largest trade partners, China and the United States (US) are not included in this list. Even though the two largest trade partners are not included, the weight of the FTA partners is increasing for the Japanese firms.

Table 2 presents the number of overseas affiliates of Japanese firms. The figures

[6] We focus on the manufacturing sector although the data source also includes the service sector because this paper examines the effects of FTAs on the industrial hollowing out.
[7] We cannot add total factor productivity (TFP) instead of labor productivity because out data source doesn't include capital.
[8] http://unctad.org/en/Pages/statistics.aspx
[9] http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6
[10] http://www.mofa.go.jp/mofaj/gaiko/fta/index.html

in the table indicate a substantial increase in the number of overseas affiliates from 15,509 in 2002 to 25,481 in 2013. One notices significant changes in the geographical shares of these affiliates during the 2002-2013 period. In 2002 a meager 5.6 percent of all overseas affiliates were located in Singapore, the only FTA partner then. The corresponding shares for China and the US were 13.8 and 18.8 percent, respectively. With the increase in the number of FTA partner countries, their share increased notably to reach 27.7 percent in 2013. China's share continuously increased from 2002 to 2013, although the rate of the increase was significantly lower compared to the case of FTA partners. China's share stood at 27.5 percent in 2013, almost the same as the share for the FTA partners. In contrast to the cases for the FTA partners and China, the US share declined notably from 18.8 percent in 2002 to 12.3 percent in 2013. Although the US share dropped sharply, the number of overseas affiliates of Japanese firms increased from 2,916 in 2002 to 3,135 in 2013 with some fluctuations during the 2002-2013 period. These observations indicate that Asia become the most important FDI destination for the Japanese firms while the relative weight of the US declined in the last decade. Although not shown in the table, the members of the ASEAN, the core partners of Japan's FTAs, have increased their weights although China registers the largest share. Slow growth of the number of overseas affiliates in China and contrasting rapid increase of the number for ASEAN reflects Japanese firms' China-plus-one strategy, or diversification strategy to reduce risk.

Table 3 shows the share of overseas affiliates in FTA member countries in overall number of affiliates. With the increase in the number of FTA members, the share increased steadily from 4.2 percent in 2002 to 32.0 percent in 2013. There are some variations among manufacturing sub-sectors. The sectors with high shares include transport equipment (38.4%), metal products (38.3%), plastics and rubber (36.6%) and wood and paper (35.1%), while those with low shares are miscellaneous (23.9%), glasses and ceramics (24.1%), and textiles, clothing and footwear (24.8%)[11].

Table 4 illustrates purchasing patterns and dependence on Japan/parent firms in Japan for the overseas affiliates of the Japanese firms. Specifically, the shares of imports from Japan / parent firms to total purchase of overseas affiliates are presented. The table shows the values for the overseas affiliates located in FTA member countries as well as those in non-FTA member countries. Furthermore, the table shows two kinds of average figures: the simple average figures as well as the weighted average figures using the size of the employment of the affiliate as the weight. The simple average figures for imports from Japan increased from 2002 to 2008 and then declined from 2008 to 2013, while the corresponding figures for the imports from parent firms declined from 2009 to 2013, for

[11] The figures are for 2013.

which the data are available. More or less the similar patterns can be observed for the weighted average figures, although the magnitude of the average figures are lower for the weighted average than simple average.

These observations reveal interesting patterns of dependence on Japan/parent firms in Japan in the purchasing behavior of the overseas affiliates. First, the declining trend of the figures since 2008/2009 seems to reflect the following two developments. One is the declining dependence on Japan and parent firms in Japan and increasing dependence on local suppliers for the procurement of inputs and materials with the period of operation[12]. The other factor is the changing types of countries that became Japan's FTA partners. In the early stage of Japan's FTA engagement, countries such as Singapore, Malaysia, and Thailand, which had close trading relations with Japan, became FTA partners, while in the later stage, countries including Switzerland, India, and Peru, whose trade relationship is rather limited, became FTA partners, contributing to the decline in the dependence on Japan.

A comparison of simple and weighted average figures shows that dependence on Japan/parent firms is low for large affiliates. This appears reasonable since large affiliates that tend to have long operation history are likely to have established local procurement/purchase networks. On the average figures for the affiliates in FTA member countries and in non-member countries, we find that the simple average figures are lower for those in FTA member countries than those in non-FTA members, while the pattern is opposite for the weighted averages. These findings appear to indicate that in relative terms large affiliates in FTA member countries have high dependence on Japan/parent in Japan for the purchase of inputs and materials.

3. The Results

The Tobit estimation is applied to the panel data. The results of the estimation are shown in Tables 5 (Imports from Japan/Total purchase ratio, hereafter, Japanese import ratio) and 6 (imports from parent/total purchase ratio, hereafter, parent import ratio). Let us begin discussing the results on the most important variable, FTA. The estimated coefficients on FTA for the manufacturing sector are positive and statistically significant for both the Japan import ratio as well as the parent import ratio. These results support the hypothesis that FTAs would increase the significance of the Japanese industry in the regional supply chains. The magnitude of the coefficient is larger for the parent import ratio than for the Japan import ratio, implying that FTAs are used more actively for the intra-firm rather than inter-firm imports. This finding is consistent with an

[12] Kiyota et.sl (2008) obtained the similar finding.

observation that intra-firm import is more easily coordinated than inter-firm import[13]. For example, the information on the requirements for obtaining the certificate of origin (COO) that is needed to use FTA be readily transmitted from an overseas affiliate to its parent firm in Japan, compared to the case where an overseas affiliate imports inputs from non-related firms, or through inter-firm trade.

An examination of the results for the manufacturing subsectors reveals that the expected positive impacts are found for many subsectors while unexpected negative impacts are obtained for several subsectors. Specifically, for the case of Japan import ratio positive coefficients are obtained for eight (statistically significant for four subsectors) out of eleven subsectors, while for the case of parent import ratio, positive impacts are found for nine (statistically significant for four subsectors) out of eleven subsectors. The subsectors for which the estimated coefficient on FTA is positive and statistically significant are food, textiles, metal, and miscellaneous for the Japan import ratio, and food, textiles, wood, and electronics for the parent import ratio. These results may reflect the fact that FTA was extensively and intensively used for trade in these products. High utilization of FTAs may be attributable to the following factors. One is high FTA tariff premium (MFN tariff rate – FTA tariff rate) and the other is non-restrictive rules of origin (ROO).[14] A closer examination is needed to verify these observations.

Discussions on the results of the control variables are going to be kept rather short. The estimated coefficients on the distance variable are mostly negative as expected and they are mostly statistically significant. The coefficients on GDPi, GDP of the host country, are mostly negative and statistically significant in many cases for the Japan import ratio and the corresponding values for the parent import ratio are mixed. These observations appear to indicate that host country GDP captures supply capability rather than market size. A different interpretation may be presented for Japan's GDP, as their estimated coefficients are mostly negative and statistically significant, particularly so for the parent import ratio. In other words, an increase in Japan's GDP reduces the Japan import ratio as well as the parent import ratio. This finding probably reflects the relationship in that an increase in domestic demand in Japan reduces the availability of products exported to the overseas affiliates of Japanese firms. The coefficients on EXR are mostly positive for the parent import ration as expected while mixed for the Japan import ratio. In addition, the significantly negative estimates are found in agriculture and material related industries. These findings also seem to illustrate the differences in coordination between intra- and inter-firm imports.

[13] Takahashi and Urata (2010) obtained the similar finding.
[14] On these points, see Ando and Urata (2017).

The estimated coefficients on Kogaisha (STATUS), or the first generation affiliates, are mostly positive as expected and they are mostly statistically significant. Compared to Magogaisha (second-generation affiliates), Kogaisha tends to rely more heavily on parent firm, leading to high Japan and parent import ratios. The estimated coefficients on age are significantly negative as expected. The longer the operation of the overseas affiliates, the more likely they have developed local procurement sources. The signs of the estimated coefficients on productivity are mixed, while those on size are mostly negative as expected.

4. Conclusions

Possible negative impacts of the reorganization of regional supply chains on the Japanese economy and industry such as hollowing out has become a serious issue, as it leads to the reduction in production, employment and undermines the competitiveness of the Japanese economy, in particular regional and rural economy. A decline in competitiveness has serious implications for the future of the Japanese economy. Faced with shrinking demand in Japan due to declining population, exports would play an important role in achieving economic growth, or in maintaining and improving the living standard of the Japanese people. Improving competitiveness is necessary for the Japanese manufacturing sector to expand exports.

Outward foreign direct investment (FDI) has been accused of being one of the main causes of a reduction of domestic production in the Japanese industries, as overseas production by Japanese firms is argued to contribute to a decline in exports, which in turn leads to the hollowing out of the Japanese economy and industry. Although the validity of these assertions needs to be rigorously examined, recognition of these observations has led to an argument that free trade agreements (FTAs) would contribute to increasing the significance of the Japanese industries in the regional supply chains by expanding Japan's exports and discouraging overseas production, thereby contributing to the prevention of the hollowing out.

In light of these arguments, we examined the impacts of FTAs on Japan's exports to FTA partner countries by using firm-level transaction data of overseas affiliates of the Japanese firms. Specifically, we performed statistical tests on the impacts of FTAs on overseas affiliates' imports from Japan (and from parent firms in Japan). These import values are divided by total input/intermediate goods purchase by the overseas affiliates for the analysis, as we were interested in substitution of local purchase by imports from Japan.

Our analysis found that FTAs contributed to an increase in import/total purchase

ratio for manufacturing as a whole and for several manufacturing subsectors. These findings tend to support the validity of the argument that FTAs would contribute to increasing the significance of the Japanese economy in the supply chains, thereby possibly preventing the hollowing out of the Japanese economy and industry. This observation leads to several policy implications for increasing the use of FTAs by Japanese firms. Judging from the opinions of the firms, which are expressed in various surveys conducted by the Japan External Trade Organization (JETRO) and other organizations, basically two types of policy recommendations may be made for the Japanese government to increase the use of FTAs by Japanese firms. One is the dissemination of the information about FTAs and the benefits of using FTAs and the other is to facilitate the use of FTAs mainly by reducing the “cost” of obtaining certificate of origin that is needed to use FTAs. Specifically, the rules of origin that certifies the requirement for FTA preferential treatment and the procedure for obtaining the certificate of origin need to be simplified.

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Table 1 Japan's Free Trade Agreement

	FTA Partners	Start of negotiatons	Signinig of agreement	Enactment of agreement
In action	Singapore	Jan 2001	Jan 2002	Nov 2002
	Mexico	Nov 2002	Sep 2004	Mar 2005
	Malaysia	Jan 2004	Dec 2005	Jul 2006
	Chile	Feb 2006	Mar 2007	Sep 2007
	Thailand	Feb 2004	Apr 2007	Nov 2007
	Indonesia	Jul 2005	Aug 2007	Jul 2008
	Brunei	Jun 2006	Jun 2007	Jul 2008
	ASEAN	Apr 2005	Apr 2008	Dec 2008
	Philippines	Feb 2004	Sep 2006	Dec 2008
	Switzerland	May 2007	Feb 2009	Sep 2009
	Vietnam	Jan 2007	Dec 2008	Oct 2009
	India	Jan 2007	Feb 2011	Aug 2011
	Peru	May 2009	May 2011	Mar 2012
	Australia	Apr 2007	Jul 2014	Jan 2015
	Mongolia	Jun 2012	Feb 2015	Jun 2016
Signed	TPP*	Jul 2013	Feb 2016	
In negotiation	South Korea**	Dec 2003**		
	GCC (Gulf Cooperation Council)***	Sep 2006***		
	Canada	Nov 2012		
	Colombia	Dec 2012		
	China-Japan-S. Korea	Mar 2013		
	EU	Apr 2013		
	RCEP	May 2013		
	Turkey	Dec 2014		

Notes:

* TPP Negotiations began in March 2010. Japan joined the TPP negotiations in July 2013

** Negotiations with South Korea was suspended in November 2004.

*** Negotiations postponed in 2010.

Source: Ministry of Foreign Affairs and newspaper reportings.

Table 2 Number of Overseas Affiliates of Japanese Firms

Year	FTA Partners	Share	China	Share	US	Share	Total
2002	869	5.6%	2,133	13.8%	2,916	18.8%	15,509
2003	849	5.4%	2,491	15.9%	2,772	17.7%	15,674
2004	892	5.4%	2,491	15.2%	2,820	17.2%	16,404
2005	1,054	6.1%	3,430	19.9%	2,895	16.8%	17,198
2006	1,711	9.7%	3,743	21.2%	2,894	16.4%	17,647
2007	3,023	16.9%	3,988	22.2%	2,829	15.8%	17,925
2008	4,565	24.2%	4,491	23.8%	2,859	15.1%	18,873
2009	4,776	24.2%	4,812	24.4%	2,934	14.9%	19,711
2010	4,888	24.2%	4,978	24.6%	2,909	14.4%	20,206
2011	5,247	25.2%	5,259	25.3%	2,887	13.9%	20,781
2012	6,598	26.5%	6,868	27.6%	3,180	12.8%	24,881
2013	7,070	27.7%	7,009	27.5%	3,135	12.3%	25,481

Table 3 Shares of Overseas Affiliates in FTA Members in Overall Number of Affiliates (%)

Year	Manufacturing	Food	Textile	Wood	Chemical	Plastic	Glass	Metal	Machinery	Electronics	Transport	Miscellaneous
2002	4.2	2.7	0.4	1.1	5.6	5.7	3.8	4.5	4.5	6.7	1.1	3.7
2003	3.8	2.9	0.6	0.6	5.0	4.3	3.6	4.2	4.0	6.2	1.0	3.7
2004	3.7	3.0	0.4	0.6	4.9	5.1	3.7	4.6	4.3	5.9	0.7	3.4
2005	4.4	3.0	0.7	0.5	5.1	6.0	3.0	4.6	5.0	7.0	2.6	3.4
2006	9.3	5.6	2.0	11.2	9.5	12.7	10.3	12.3	7.9	15.1	5.6	4.9
2007	18.2	16.3	11.1	20.8	16.9	23.6	20.4	25.4	17.1	19.1	16.7	12.3
2008	28.3	24.8	21.3	34.1	27.6	33.8	25.5	35.7	24.1	31.1	28.2	23.2
2009	28.5	24.1	22.0	38.6	27.6	33.8	29.1	35.5	23.2	30.5	29.5	23.3
2010	30.5	25.3	22.2	39.5	29.0	33.4	27.0	25.9	26.2	32.1	34.5	23.1
2011	30.6	25.4	23.3	34.5	29.0	35.6	28.9	27.2	25.6	29.7	35.8	22.9
2012	31.1	26.2	21.9	36.4	29.9	34.2	27.1	36.2	25.9	30.8	38.0	24.6
2013	32.0	27.1	24.8	35.1	31.6	36.6	24.1	38.3	26.7	29.9	38.4	23.9

Table 4 Proportion of Imports in Total Purchase by Overseas Affiliates

	Average			Weighted Average		
Year	All	Non-FTA	FTA	All	Non-FTA	FTA
Imports from Japan						
2002	0.1695	0.1667	0.2162	0.1822	0.1815	0.2190
2003	0.1822	0.1796	0.2280	0.1831	0.1825	0.2219
2004	0.1816	0.1779	0.2458	0.1789	0.1786	0.2008
2005	0.1825	0.1801	0.2196	0.1811	0.3987	0.1154
2006	0.1882	0.1873	0.1962	0.1745	0.1770	0.1466
2007	0.1881	0.1892	0.1828	0.1726	0.1760	0.1584
2008	0.2656	0.2686	0.2563	0.1836	0.1708	0.2085
2009	0.1965	0.1952	0.2006	0.1533	0.1393	0.1825
2010	0.1797	0.1788	0.1823	0.1514	0.1421	0.1688
2011	0.1723	0.1723	0.1722	0.1412	0.1311	0.1582
2012	0.1624	0.1631	0.1606	0.1341	0.1223	0.1530
2013	0.1612	0.1614	0.1606	0.1238	0.1113	0.1429
Imports from Parent Firm						
2009	0.1607	0.1609	0.1600	0.1201	0.1118	0.1374
2010	0.1497	0.1499	0.1489	0.1197	0.1139	0.1307
2011	0.1500	0.1513	0.1464	0.1173	0.1099	0.1298
2012	0.1417	0.1435	0.1366	0.1152	0.1069	0.1285
2013	0.1392	0.1411	0.1341	0.1023	0.0931	0.1166

Table 5　The Determinants of Dependence on Japan in Total Purchase of Overseas Affiliates of Japanese Firms

Dependent Variable: Import from Japan / Total Purchases (including local procurement)												
	Manufacturing	Food	Textile	Wood	Chemical	Plastic	Glass	Metal	Machinery	Electronics	Transport	Miscellaneous
lnGDPi	-0.0244***	-0.0135	-0.0368***	0.00131	-0.0217***	-0.0107	-0.0536***	-0.0678***	-0.0181***	-0.0151***	-0.0169***	-0.0145
	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
lnGDPj	-0.569***	-0.611**	0.0794	-0.777**	-0.484***	-0.423**	-1.213***	-0.870***	-0.442***	-0.720***	-0.956***	-0.620***
	(0.04)	(0.25)	(0.25)	(0.38)	(0.15)	(0.19)	(0.37)	(0.18)	(0.12)	(0.11)	(0.10)	(0.23)
lnEXR	0.0464***	-0.145***	0.285***	-0.0958	-0.0236	-0.0134	-0.308***	-0.0741**	0.0434**	0.0991***	0.0630***	0.0781*
	(0.01)	(0.05)	(0.04)	(0.07)	(0.03)	(0.03)	(0.06)	(0.03)	(0.02)	(0.02)	(0.02)	(0.04)
lnDIST	-0.0502***	-0.0620**	-0.154***	-0.331***	-0.0809***	-0.104***	-0.0143	-0.0798***	0.00343	-0.0503***	-0.0101	-0.0369
	(0.01)	(0.03)	-(0.03)	(0.05)	(0.02)	(0.02)	(0.04)	(0.02)	(0.01)	(0.01)	(0.01)	(0.03)
STATUS	0.155***	0.162***	-0.0283	0.108	0.196***	0.144***	-0.0349	0.162***	0.206***	0.182***	0.168***	0.167***
	(0.01)	(0.06)	(0.05)	(0.09)	(0.03)	(0.04)	(0.07)	(0.03)	(0.02)	(0.02)	(0.02)	(0.04)
AGE	-0.00302***	0.0223	-0.00294**	-0.00352	-0.000635	-0.00686***	0.00176	-0.00709***	-0.00507***	-0.00273***	-0.00414***	0.00538***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PROD	0.0164***	-0.0246**	0.0556***	0.0182	0.0135**	-0.0403***	0.0120	-0.0145**	0.0399***	0.0359***	0.000747	0.0238***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
SIZE	-0.00692***	-0.0184*	0.0243**	0.00655	-0.00148	-0.0241***	-0.000808	0.00428	-0.0164***	-0.0125***	-0.00645*	0.0368***
	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
FTA	0.0110**	0.0787***	0.171***	0.0423	0.0135	0.00155	-0.0216	0.0409**	0.00796	-0.0208*	-0.0185*	0.0657**
	(0.01)	(0.03)	(0.03)	(0.04)	(0.02)	(0.02)	(0.04)	(0.02)	(0.01)	(0.01)	(0.01)	(0.03)
Constant	20.08***	18.96**	-1.684	25.52**	15.18***	13.70**	38.44***	28.27***	13.21***	21.42***	28.24***	18.11***
	(1.47)	(7.39)	(7.39)	(11.24)	(4.44)	(5.62)	(10.95)	(5.43)	(3.45)	(3.27)	(3.12)	(6.83)
n Obs	127526	6378	7633	2522	15895	7199	3596	12202	21232	23427	22548	4894
N ids	21746	1205	1494	529	2803	1537	639	2712	4209	4485	3709	1081
Note: The standard errors are in parentheses												
***, **, * are 1, 5, and 10 percent significance levels, repsectively												

Table 6　The Determinants of Dependence on Parent Firms in Total Purchase of Overseas Affiliates of Japanese Firms

Dependent Variable: Import from Parent Firm / Total Purchases (including local procurement)												
	Manufacturing	Food	Textile	Wood	Chemical	Plastic	Glass	Metal	Machinery	Electronics	Transport	Miscellaneous
lnGDPi	-0.00216	0.0156	0.0347	0.148***	-0.0147	0.0151	-0.0935**	-0.0384**	0.00968	0.00750	0.00520	-0.0280*
	(0.00)	(0.02)	(0.03)	(0.05)	(0.01)	(0.02)	(0.04)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
lnGDPj	-0.333***	-0.0186	0.464	-2.379***	0.280	-0.209	0.515	-0.284	-0.682***	-1.021***	-0.251	0.0870
	(0.09)	(0.44)	(0.45)	(0.91)	(0.26)	(0.33)	(0.57)	(0.30)	(0.21)	(0.25)	(0.16)	(0.39)
lnEXR	0.0927***	0.0753	0.231***	-0.153	0.101*	0.0286	0.141	0.0652	0.0850**	-0.0257	0.182***	0.112
	(0.02)	(0.09)	(0.09)	(0.18)	(0.06)	(0.06)	(0.11)	(0.06)	(0.04)	(0.05)	(0.03)	(0.08)
lnDIST	-0.0337***	0.0389	-0.0690	-0.200**	-0.0765***	-0.0550*	0.0167	-0.00503	-0.0291	-0.0858***	-0.0125	0.0376
	(0.01)	(0.04)	(0.05)	(0.09)	(0.03)	(0.03)	(0.07)	(0.03)	(0.02)	(0.03)	(0.02)	(0.04)
STATUS	0.199***	0.289***	0.00383	0.141	0.168***	0.212***	0.234**	0.210***	0.218***	0.216***	0.172***	0.282***
	(0.01)	(0.09)	(0.09)	(0.13)	(0.05)	(0.05)	(0.12)	(0.06)	(0.03)	(0.03)	(0.03)	(0.06)
AGE	0.000413	0.00403*	0.00278	0.00228	-0.000995	0.00274	0.00374	0.000254	0.000250	-0.000812	-0.000244	0.00462**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
PROD	0.00206	-0.0507***	0.0194	0.0396	0.00902	-0.0413***	0.0477**	-0.00511	-0.00127	0.0231***	-0.000117	-0.00278
	(0.00)	(0.02)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
SIZE	-0.0173***	-0.00373**	0.00805	0.0232	-0.337***	-0.0372***	-0.00675	-0.000569	-0.0463***	-0.0157**	-0.0102*	0.0488***
	(0.00)	(0.00)	(0.02)	(0.03)	(0.11)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
FTA	0.0504***	0.158**	0.268***	0.580***	0.0315	0.0839	-0.173	0.00648	0.0589	1.300***	0.0129	-0.0676
	(0.02)	(0.07)	(0.10)	(0.17)	(0.05)	(0.06)	(0.14)	(0.06)	(0.04)	(0.46)	(0.02)	(0.07)
Constant	9.585***	-1.086	-15.47	67.07**	-7.817	5.970	-13.65	8.891	19.60***	30.28***	6357	-3.074
	(2.63)	(13.29)	(13.29)	(26.97)	(7.72)	(9.71)	(16.77)	(8.99)	(6.33)	(7.59)	(4.67)	(11.73)
n Obs	39930	1964	1966	786	4525	2909	1071	4383	7186	5483	7963	1694
N ids	12303	632	647	256	1332	975	323	1441	2293	1753	2426	531
Note: The standard errors are in parentheses												
***, **, * are 1, 5, and 10 percent significance levels, repsectively												

Appendix Table　Industry Classification

Industry Classification	Abbreviation
Foods and Beverages	Foods
Textile, Clothing and Footwear	Textile
Wood and Paper	Woods
Chemicals	Chemicals
Plastics and Rubber	Plastics
Glasses and Ceramics	Glasses
Metals	Metals
General Purpose Machinery	Machines
Electric and Electronic Components	Electronics
Transportation Equipment	Transport
Miscellaneous	Others