

# **Currency Invoicing Decision: New Evidence from a Questionnaire Survey of Japanese Export Firms**

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## **Abstract**

There have been only a few studies that empirically examine the firm's decision on price setting and/or currency invoicing in international trade. This paper is the first study that conducts the questionnaire survey with all manufacturing firms listed in Tokyo Stock Exchange concerning the choice of invoicing currency at a firm level. Questionnaires were sent out to 920 Japanese firms in September 2009 and 227 firms responded. We present the new firm-level evidence on the choice of invoicing currency by destination and by type of trading partner, and also the share of invoicing currency of Japanese production subsidiaries in Asia. By conducting cross-section analysis, we found the following evidences: (1) highly differentiated goods and/or strong competitiveness of the products promote Japanese yen invoicing in exports to all countries, (2) larger share of intra-firm trade promotes importer's currency invoicing in exports to advanced countries, and (3) the production-sales networks of Japanese firms whose Asian production subsidiaries export their final products to other countries/region promote US dollar invoicing in exports to Asian countries.

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**Keywords:** Invoice currency; Japanese exports; intra-firm trade; production network

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## 1. Introduction

The objective of this paper is to investigate determinants of invoicing currencies among Japanese exporters based on a new firm-level data set constructed from an original questionnaire survey for this purpose.

How firms choose the currency of their exports has been a popular topic of investigation in the field of international economics. At the firm level, the choice of invoicing currency plays a crucial role in determining whether exporters or importers bear the exchange rate risk. At the macro level, the international transmission of economic fluctuations, at least in the short run, is influenced by the firms' behavior of price setting and/or currency invoicing, as discussed in the literature on New Open Economy Macroeconomics.

While there is a growing theoretical literature on a firm choosing an invoice currency, a rigorous empirical analysis based on the firm-level data is scarce. Friberg and Wilander (2008) conducted a questionnaire survey of Swedish exporting firms and analyzed empirically determinants of their invoicing currency. To our knowledge, there has been no other study based on a questionnaire survey on invoicing currency in an advanced country, probably due to the technical difficulty and costs in collecting data. However, the firm-level data are crucial for rigorous and persuasive empirical analysis.

Investigating a currency invoicing pattern of Japanese exporters is particularly interesting in the invoicing literature, since many regard it a puzzle that the yen has not become a major invoicing currency in Asia, despite its only status of fully convertible currency in the region. The micro-survey data will give us a clue to decision making that would explain this puzzle. It has been documented, mostly in macro data, that there is a strong tendency among Japanese exporters to choose the importer's currency for their export to advanced countries and to choose the US dollar for exports to emerging markets and developing countries in East Asia.<sup>1</sup> The latter is more puzzling because Japanese firms have built a regional production network over the last two decades.

To solve the puzzles, we conducted a questionnaire survey analysis involving all Japanese manufacturing firms that are listed in the Tokyo Stock Exchange (TSE). With the support of the Research Institute of Economy, Trade, and Industry (RIETI), questionnaires were sent out to 920 listed firms in September 2009, and 227 firms responded. The questionnaire contains questions on various information not only on the firms' invoicing choice by industry, destination, and type of trading partners, but also on the firms' foreign exchange rate risk management.

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<sup>1</sup> See Ito, Koibuchi, Sato and Shimizu (2010b) that analyzes the currency invoicing choice of Japanese exporting firms by the interview with 23 representative firms.

By conducting cross-section analysis, we found the following evidences. First, highly differentiated goods and/or strong competitiveness of the products promote Japanese yen invoicing in exports to all countries/region. Second, larger share of intra-firm trade in exports and lower hedging cost of importer's currency vis-à-vis Japanese yen promotes importer's currency invoicing in exports to advanced countries/region. Third, the production-sales networks of Japanese firms whose Asian production subsidiaries export their final products to other countries/region promote US dollar invoicing in exports to Asian countries.

The novelties of this paper are three-fold. First, by the questionnaire, we collected firm-level information on the share of invoicing currency by destination. Such destination breakdown data on the invoicing share at a firm-level has not been published before. Second, we obtained the share of invoicing currency by trading partner. Specifically, the choice of invoicing currency may depend on whether importers are own subsidiary/group-company (intra-firm trade) or independent company (inter-firm trade). We show the difference in invoicing decision between intra-firm and inter-firm trade. Third, we investigate the invoicing choice of Japanese production subsidiaries in Asia. Specifically, we obtained information on where and in which currency the production subsidiaries sell/export their products. It is well recognized that Japanese production subsidiaries in Asia, which procure intermediate inputs from Japan and regional economies, tend to export their products to the United States. A questionnaire used by Friberg and Wilander (2008) lacked information on destination and characteristics of trading partners.

The remainder of this paper is organized as follows. Section 2 surveys the existing researches on currency invoicing. Section 3 describes the 2009 RIETI survey and the characteristics of responded firms. Sections 4 shows the new evidence of the share of invoicing currency classified by destination and type of trading partner. In section 5, determinants of currency invoicing decision are empirically examined. Section 6 concludes this study.

## 2. Existing literature

The existing empirical studies on invoice currency can be classified into the following two types. The first is a group of papers to investigate facts and tendencies of invoice currency choices in the trade. The classic studies such as Grassman (1973) and Page (1981) discovered a pattern of the invoice currency choice in the trade between advanced countries, and the trade between advanced and developing countries. However, no major innovation occurred in this line of research until Friberg and Wilander (2008) that collected information by questionnaire. Ito et al. (2010b) conducted interviews to collect information on the Japanese major export companies

and investigated facts on their invoicing behavior. The second is a group of papers to analyze a determinant of the invoice currency choice by using cross country data. It is difficult to obtain information about the invoice currency choice with detailed information. However Goldberg and Tille (2008) and Kamps (2006) collect the shares of the invoice currency in the total export and import by country level as much as possible and analyze a factor to decide an invoice currency by cross-country analysis.<sup>2</sup>

### 3. The Survey

#### 3-1. Questionnaire

In order to obtain crucial information, we have designed questionnaire survey that contains question items that are more detailed than Friberg and Wilander (2008). Potential factors that determine the invoice currency for Japanese firms are discussed the interview-based paper, Ito et al. (2009) (2010b), in which it was shown that whether exports are intra-firm trade (trading with affiliate company) and inter-firm trade (trading with non affiliate company) makes difference in the choice of invoice currency of Japanese firms. Furthermore, there was suggestive evidence that the Asian subsidiaries that assembles products from Japanese parts and exports to the US may prefer the dollar invoicing on the leg from Japan to Asia. Hence, questions to reveal whether subsidiaries sell to the local market or export to the third market are included in the questionnaire of this study. Questions regarding the production networks developed by Japanese manufacturing firms in Asia distinguishes this questionnaire survey from any other invoicing currency papers.

The questionnaire was sent out by mail in September 2009 by The Research Institute of Economy, Trade, and Industry (RIETI), Japan. Among TSE-listed 920 companies in the manufacturing industry sector, those that report "Foreign Sales", proxy for overseas activities, in their consolidated financial statements as of fiscal year 2008 (as of March 2009 for most of firms) were selected. The number of exporting manufacturing firms that have foreign activities turned out to be 227. The details of responses will be described in the next section. The contents of the 2009 RIETI survey are constituted of the following four parts:

Part 1. Risk management system and technique with regard to the foreign exchange risk;

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<sup>2</sup> Goldberg and Tille (2009) obtains a detailed invoice currency share by industry in the import of the Canadian customs-based accounting and analyzes the determinant of the invoice currency. There are not so many other analysis like this except for Donnenfeld and Haug (2003, 2008) because of the difficulty of such kind of data collection.

- Part 2. Price setting strategy against the foreign exchange rate fluctuations;
- Part 3. Shares of invoice currencies of the total export from the head office (Japan) to the world and any principle in choosing invoice currencies;
- Part 4. Invoice currency share by destination country (or region) and by types of trading partners

The first question in Part 1 is whether a settlement currency is the same as an invoice currency. Whether a settlement currency could be distinguished with the invoice currency has been debated in the literature for a long time. The question is intended to reveal how Japanese firms treat invoicing and settlement in their business.<sup>3</sup> Next, it is asked what kind of currencies that Japanese firms uses in their foreign trades and ask what kind of inconveniences that they face when they handle each currency. Then, the next question asks how foreign exchange risk is managed in detail: i) hedging instruments and hedging horizon, ii) company's policy on hedging, iii) in-house foreign exposure control such as "marry" and "netting", iv) the type of foreign exchange risk management system.

Part 2 is concerned about the pass-through of the exchange rate fluctuation to the export price. After inquiring whether there exists an internal price revision rule in response to the foreign exchange fluctuation, it is asked whether Japanese firms revised their price in response to a sudden appreciation of the Japanese yen after the Lehman shock in September 2008.

Parts 3 and 4 are the core of our questionnaire survey. In Part 3, it is asked the share of invoice currencies in their total exports from Japan to the world. In Part 4, is is asked the share of invoice currencies by three phases as follows: the share of invoice currency by destination country (region); the share of invoice currency by types of trading partner, such as intra-firm trade (production base), intra-firm trade (sales base), or inter-firm trade (local distributor). The second question is whether the firm is Japanese trading company ("*Sogo-shosha*") and others (Table b), followed by the question on the share of invoice currencies in local sales or exports from an overseas production base to the third countries (Table c).<sup>4</sup> These questions correspond to the structures of production and sales network that Japanese firms have developed in many parts of the world.

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<sup>3</sup> Friberg and Wilander (2008) which performed the questionnaire survey about the invoice currency among Swedish firms also asked a same question.

<sup>4</sup> Please refer to Appendix 1 for more information about a questionnaire about Q4.

### 3-2. Responded Firms

#### *Response rate and status of responded firms*

The questionnaires were sent to all manufacturers (920 firms) that were listed in the stock exchanges in Japan.<sup>5</sup> As 227 firms responded until December 2009, the response rate is 24.7%. The 208 firms (91.6%) of all responded firms are manufactures with capital over 1 billion yen, and the 174 firms (76.4%) have more than 300 employees. Therefore, most of responded firms are considered as large companies.

Table 3-1 reports numbers of all listed manufacturers and the responded firms, and total and average of consolidated sales and foreign sales by type of industry as of the end-corporate fiscal year immediately before the questionnaire were sent.

Table 3-1. Status of manufacturers listed in the TSE and responded firms

Type of Industry	Firms that questionnaire were sent (All manufacturers with foreign sales listed in the stock exchanges)			Responded firms					
	# of sample firms (A)	Consolidated sales (sum, million yen) (B)	Foreign sales (sum, million yen) (C)	# of sample firms (D)	(D)/(A) (%)	Consolidated sales (sum, million yen) (E)	(E)/(B) (%)	Foreign sales (sum, million yen) (F)	(F)/(C) (%)
All manufacturers	920	302,290,060	143,760,877	227	24.7	86,475,914	28.6	39,169,835	27.2
Foods	15	12,889,824	4,678,669	3	20.0	1,451,476	11.3	454,748	9.7
Textiles & Apparel	28	5,025,318	1,646,818	9	32.1	919,282	18.3	158,263	9.6
Pulp & papers	7	379,274	93,342	0	0.0	---	0.0	---	0.0
Chemicals	143	29,680,695	10,458,282	36	25.2	9,831,227	33.1	3,472,935	33.2
Pharmaceuticals	20	6,266,656	2,462,544	3	15.0	692,592	11.1	68,852	2.8
Oil & Coal Products	7	19,119,287	2,583,049	1	14.3	3,428,211	17.9	399,070	15.4
Rubber Products	16	5,410,788	3,353,052	4	25.0	394,042	7.3	141,373	4.2
Glass & Ceramics	29	5,393,874	2,552,011	6	20.7	331,891	6.2	155,869	6.1
Steel Products	29	16,724,111	5,364,899	6	20.7	5,296,590	31.7	1,493,327	27.8
Nonferrous Metals	21	8,840,646	2,717,890	5	23.8	1,016,916	11.5	154,716	5.7
Metal Products	30	2,976,691	957,658	9	30.0	1,555,912	52.3	657,107	68.6
Machinery	174	22,407,692	10,996,155	40	23.0	6,334,195	28.3	3,231,035	29.4
Electrical Machinery	231	81,506,235	41,219,988	55	23.8	29,123,918	35.7	11,781,163	28.6
Transport Equipment	86	73,011,842	48,799,919	27	31.4	23,981,759	32.8	15,775,875	32.3
Precision Instruments	43	4,449,396	2,595,533	15	34.9	1,657,104	37.2	1,026,057	39.5
Other Products	41	8,207,731	3,281,068	8	19.5	460,799	5.6	199,445	6.1

Source: 2009 RIETI Survey

We received responses from more than one firm in all types of manufacturing industry except the Pulp & Papers. We categorize the Chemical, Machinery, Electrical Machinery, Transport Equipment, and Precision Instruments as "5 major types of industry" that have responses from more than 15 firms in each type of industry and their response rates are ranging from 23.0% to 34.9%. Textiles & Apparel and Metal Products that have 9 responding firms and also have comparable response rates to 5 major types of industry.

<sup>5</sup> Stock exchanges in Japan include 6 stock exchanges (Tokyo, Osaka, Nagoya, Fukuoka and Sapporo) and 3 emerging markets (JASDAQ, Mothers, and Hercules).

All responding firms covers 28.6% and 27.2% of all listed manufacturers in terms of consolidated sales and foreign sales, respectively. By type of industry, shares of responded firms in 5 major types of industry in terms of consolidated sales and foreign sales account for 30% or over of all listed firms.

Table 3-2 reports sample averages by type of industry of consolidated sales and foreign sales per company and foreign sales ratio (foreign sales / consolidated sales). Firm size and foreign sales ratio of responding firms are comparable to those of all listed manufactures. By type of industry, the firm size of responding firms in electrical machinery and chemicals is larger than that of all listed manufactures in the same industry. In terms of foreign sales ratio, we do not observe large difference between responding firms and all firms that received questionnaires.

Table 3-2. Status of manufacturers listed in the TSE and responded firms (sample average)

Type of Industry	Firms that questionnaire were sent (All manufacturers with foreign sales listed in the stock exchanges)			Responded firms		
	Consolidated sales (average, million yen)	Foreign sales (average, million yen)	Foreign sales / Consolidate sales (average, million yen)	Consolidated sales (average, million yen)	Foreign sales (average, million yen)	Foreign sales / Consolidate sales (average, million yen)
All manufacturers	328,576	159,912	37.6	380,951	190,145	37.0
Foods	859,322	334,191	22.3	483,825	227,374	32.3
Textiles & Apparel	179,476	58,815	24.2	102,142	17,585	23.2
Pulp & papers	54,182	13,335	21.2	---	---	---
Chemicals	207,557	74,702	30.2	273,090	105,240	34.7
Pharmaceuticals	313,333	123,127	29.7	230,864	22,951	10.5
Oil & Coal Products	2,731,327	369,007	17.6	3,428,211	399,070	11.6
Rubber Products	338,174	223,537	34.5	98,511	47,124	32.2
Glass & Ceramics	185,996	88,000	36.4	55,315	25,978	30.3
Steel Products	576,693	191,604	27.8	882,765	298,665	23.4
Nonferrous Metals	420,983	129,423	28.0	203,383	30,943	17.6
Metal Products	99,223	31,922	30.7	172,879	73,012	37.8
Machinery	128,780	64,683	40.9	158,355	89,751	35.7
Electrical Machinery	352,841	181,586	43.4	529,526	231,003	43.7
Transport Equipment	848,975	580,951	45.7	888,213	631,035	41.3
Precision Instruments	103,474	64,888	44.6	110,474	85,505	48.2
Other Products	200,189	84,130	36.2	57,600	33,241	37.0

Source: 2009 RIETI Survey

#### *Two types of firm category*

To analyze results of the survey further, two categories are created: by the firm size and by the foreign sales ratio. The former is a size category based on total consolidated sales.<sup>6</sup>

<sup>6</sup> Sales are measured in the annual statement as of the reporting date of immediately before the survey (mostly of them at end-March 2009)

The samples are categorized into three: large (upper 1/3), medium (middle 1/3) and small (lower 1/3). The latter is a foreign sales category based on foreign sales ratio (total foreign sales / total consolidated sales) splitting all listed manufacturers into high (upper 1/3), medium (middle 1/3) and low (lower 1/3). Table 3-3 reports the number of firms included in two types of firm category. Table 3-3 shows that firms with larger consolidated sales and lower foreign sales ratio have higher response rates. If any, these observations give indications of caution with respect to a sampling bias. However, we do not think the bias is serious one.

Table 3-3. Status of manufacturers listed in the TSE and responded firms

Firm category	Total consolidated sales			Total foreign sales / Total consolidated sales		
	Large (upper 1/3)	Medium (middle 1/3)	Small (lower 1/3)	High (upper 1/3)	Medium (middle 1/3)	Low (lower 1/3)
All listed manufacturers	307	306	307	309	302	308
Responded firms	86	73	68	69	71	87
Percent(%)	28.0	23.9	22.1	22.3	23.5	28.2

Source: 2009 RIETI Survey

#### *Which department responded the survey?*

The questionnaire required firms to answer which department (or division) of the company a respondent belongs to. Table 3-4 summarizes results showing that in 179 firms (78.9%), a person working for the treasury (accounting) department responded to our survey.

Table 3-4. Respondents' department and division

Department (or division)	Treasury (accounting) department	Business management division	Overseas sales division	Business (sales) department	Other department	N.A.
Responded firms (227 firms)	179	25	14	2	4	3
Percent (%)	78.9	11.0	6.2	0.9	1.8	1.3

Source: 2009 RIETI Survey

## 4. Currency Invoicing

### 4-1. Invoice Currency for Export

#### *Invoice currency and settlement currency*

Table 4-1 summarizes the result of the first question whether a settlement currency (a currency to use when a trade payment is settled) is the same as an invoice currency (a currency to use when a trade price is quoted). The estimated proportion of Japanese firms that use the



same currency for invoice and settlement is 88.4%, which is 200 firms out of 226 respondents. In other words, most Japanese exporting firms handles an invoice currency and a settlement currency as the same. According to a type of industry, the ratio of the affirmative firms was the lowest in "Transport Equipment" (74.0%).

Table 4-1. Invoice currency and settlement currency

Is the same currency used for invoicing and settlement?

	Type of Industry	All manufactur	Chemicals	Machinery	Electrical Machinery	Transport Equipment	Precision Instrument
Answer	# of sample firms (A)	226	36	40	55	27	14
1. Yes. (or no distinction)	# of answers (B)	200	31	36	50	20	12
	(B)/(A)[%]	88.4	86.1	90.0	90.9	74.0	85.7
2. No.	# of answers (C)	26	5	4	5	7	2
	(C)/(A)[%]	11.5	13.8	10.0	9.0	25.9	14.2

Source: 2009 RIETI Survey

The most frequent reason why the settlement currency differs from the invoice currency is due to the foreign exchange regulation. When the local currency transaction is regulated for a non-resident firm, the different settlement currency (mostly, the US dollar or the Japanese yen) is used alternatively. Such a case is outstanding in the case of some Asian currencies, such as the Korean won, the Malaysia ringgit, and the Indonesia rupiah.

**Result 1: For most of Japanese firms, the invoice and settlement are denominated in the same currency.**

#### *The number of the handling foreign currencies*

We ask a firm to choose its handling foreign currencies from 20 kinds of foreign currencies (excluding Japanese yen) including the U.S. dollar in multiple answers allowed. Table 4-2 shows the results of 227 firms' answers. The mean of the number of the handling foreign currencies in the answered manufacturing industry is 3.1. Then, we can conclude approximately three kinds of foreign currencies in one company are used on the average. An electric machinery firm answered to handle 15 kinds of currencies at the maximum.<sup>7</sup> According to a type of industry, the mean of the number of the handling foreign currencies is 4 in "Transport Equipment", 3.5 in "Electrical Machinery", and 3 in "Machinery", respectively. It indicates that Japanese representative industries, which are supposed to develop production

<sup>7</sup> The number of 0 means that no foreign currency is handled but the Japanese yen is used for all the trade.

networks in abroad, handle various kinds of foreign currencies.<sup>8</sup>

Table 4-2. Number of foreign currency used for international trade

Number of foreign currency invoicing used for international trade (sample average)

	All firms			Total consolidated sales			Total foreign sales / Total consolidated sales		
	Average	Max	Min	Large (upper 1/3)	Medium (middle 1/3)	Small (lower 1/3)	High (upper 1/3)	Medium (middle 1/3)	Low (lower 1/3)
# of sample firms	227			86	73	68	69	71	87
<b>All manufacturers</b>	<b>3.1</b>	<b>15</b>	<b>0</b>	<b>4.4</b>	<b>2.7</b>	<b>1.9</b>	<b>3.7</b>	<b>3.2</b>	<b>2.5</b>
Chemicals	2.7	9	1	3.2	2.8	2.0	2.6	3.3	1.9
Machinery	3.3	12	0	5.0	3.2	1.7	3.7	3.0	3.2
Electrical Machinery	3.5	15	0	5.5	2.9	1.8	3.5	4.6	3.0
Transport Equipment	4.0	14	0	5.5	1.7	3.0	6.4	3.0	2.3
Precision Instruments	2.1	4	1	3.0	1.8	2.0	2.7	2.2	1.3

Source: 2009 RIETI Survey

Table 4-2 also summarizes the number of the handling foreign currencies of 5 major types of industry by firm size (total consolidated sales) and foreign sales ratio (total foreign sales/total consolidated sales). The number of the handling foreign currencies tends to increase monotonously as the firm size becomes large. According to a type of industry, this tendency is particularly remarkable in "Chemical", "Machinery", and "Electrical Machinery". In addition, the number of the handling foreign currencies tends to increase monotonously as the ratio of total foreign sales over total consolidated sales becomes larger, and this tendency is remarkable in "Transport Equipment".

**Result 2: Average Japanese firm uses 3 kinds of foreign currencies for exports. Larger firms or firms with higher exposure to foreign markets use more kinds of currencies.**

#### *The Share of Currency Invoicing in Japanese Exports to the World*

Table 4-3 presents the results of questionnaires upon the invoicing choice of Japanese firms' exports to the world, where a simple arithmetic average of the invoicing share is reported. First, in all manufacturing industries, where 217 firms responded, the share of yen-invoicing is the largest (48.2 percent) and that of US dollar invoicing is the next (42.2 percent). The share of euro invoicing accounts for only 7.1 percent, while the share of other currency invoicing is very low (2.7 percent). Second, when looking at the 5 major industry breakdown data, the share of yen-invoicing is large in the machinery and transport equipment industry. On the other hand, the share of US dollar invoicing is the largest in the electrical machinery industry. Third, other

<sup>8</sup> Although the number of answer is only 3, the mean of "Pharmaceutical" is 3.7, which is higher than other industries, too.

currency invoicing typically accounts for a relatively small share, while the share of Euro invoicing is around 10 percent or more in the machinery industry.

Let us next look at the invoicing share across the firm category (Table 4-3). In terms of the consolidated sales, it is clearly shown that the smaller the firm size, the higher the share of yen-invoicing is. In contrast, the larger the firm size, the higher the share of US dollar invoicing is. In terms of the foreign sales ratio, however, any clear pattern of the invoicing choice is not observed.

**Result 3: The yen and the US dollar are mainly used in Japanese total exports to the world. The smaller (larger) the firm size, the higher the share of yen (US dollar) invoicing is.**

Table 4-3 shows that larger firms have lower share of yen invoicing and larger share of US dollar invoicing. This suggests that sample arithmetic average of the invoicing share by currency in first column of Table 4-3 can underestimate actual share of currency invoicing in exports of Japanese listed firms. To confirm this, we calculate weighted average of share by currency using amount of total foreign sales of each responded firm, which is supposed as proxy for exports from Japan to the World.<sup>9</sup> The second column of Table 4-3 reports the weighted average using foreign sales of invoicing share by currency. The share of yen invoicing substantially decreases by 19 percent from 48 percent in arithmetic average to 29 percent in weighted average. In exchange, the share of dollar invoicing increases most by 12 percent from 42 percent to 54 percent while the euro and other currency also increase by around 3 percent.

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<sup>9</sup> Since Japanese accounting standard does not require firms with less than 10 percent foreign sales ratio (= total foreign sales / total consolidated sales) report their foreign sales in annual financial statement, we calculated amounts of total foreign sales of these firms under the assumptions that their foreign sales ratios are 10 percent of total consolidated sales.

Table 4-3. Currency invoicing share in exports from Japan to the World

Currency invoicing share in exports from Japan to the World (by firm category, sample average)

	All firms		Total consolidated sales			Total foreign sales / Total consolidated sales		
	Arithmetic average	Weighted average <sup>1)</sup>	Large (upper 1/3)	Medium (middle 1/3)	Small (lower 1/3)	High (upper 1/3)	Medium (middle 1/3)	Low (lower 1/3)
# of sample firms	217	217	80	70	67	64	70	83
<b>JPY</b>								
All manufacturers	48.2	28.7	38.1	50.0	58.3	41.2	52.2	50.2
Chemicals	50.4	---	33.1	54.2	66.8	52.1	50.1	49.8
Machinery	56.2	---	36.8	73.8	56.5	47.5	67.3	55.0
Electrical Machinery	38.8	---	25.7	36.5	54.3	25.1	48.9	50.7
Transport Equipment	56.3	---	49.0	71.9	56.6	47.5	47.0	77.9
Precision Instruments	44.4	---	29.8	40.4	55.0	43.8	63.5	21.3
<b>USD</b>								
All manufacturers	42.1	54.1	47.8	41.7	35.8	45.5	39.0	42.1
Chemicals	41.0	---	55.9	38.7	25.9	39.4	41.7	40.9
Machinery	29.7	---	41.0	18.0	31.1	31.3	19.8	35.8
Electrical Machinery	50.7	---	59.2	51.4	41.5	62.4	41.8	40.7
Transport Equipment	33.3	---	35.3	23.4	41.2	40.2	38.0	19.5
Precision Instruments	44.3	---	42.6	51.6	39.2	37.8	27.3	73.8
<b>Euro</b>								
All manufacturers	7.1	11.3	10.5	5.1	5.2	11.0	5.7	5.3
Chemicals	7.7	---	10.5	5.1	7.3	8.4	6.4	9.2
Machinery	11.0	---	17.5	5.8	10.1	18.5	9.6	5.9
Electrical Machinery	8.2	---	12.8	7.8	3.8	10.3	6.8	6.2
Transport Equipment	4.5	---	6.1	2.7	2.1	7.0	4.4	1.3
Precision Instruments	9.0	---	25.4	3.0	5.8	16.8	8.5	0.0
<b>Other currencies</b>								
All manufacturers	2.7	5.9	3.7	3.3	0.7	2.5	3.0	2.5
Chemicals	0.9	---	0.6	2.1	0.0	0.1	1.8	0.1
Machinery	3.2	---	4.7	2.4	2.5	3.0	3.3	3.2
Electrical Machinery	2.5	---	2.3	4.9	0.3	2.6	2.6	2.4
Transport Equipment	5.9	---	9.6	2.0	0.1	5.3	10.6	1.3
Precision Instruments	2.3	---	2.2	5.0	0.0	1.6	0.7	5.0

1) Weighted average is calculated as average of invoicing currency share of all responded firms weighted by amount of foreign sales in FY2008 of each firm.

Source: 2009 RIETI Survey

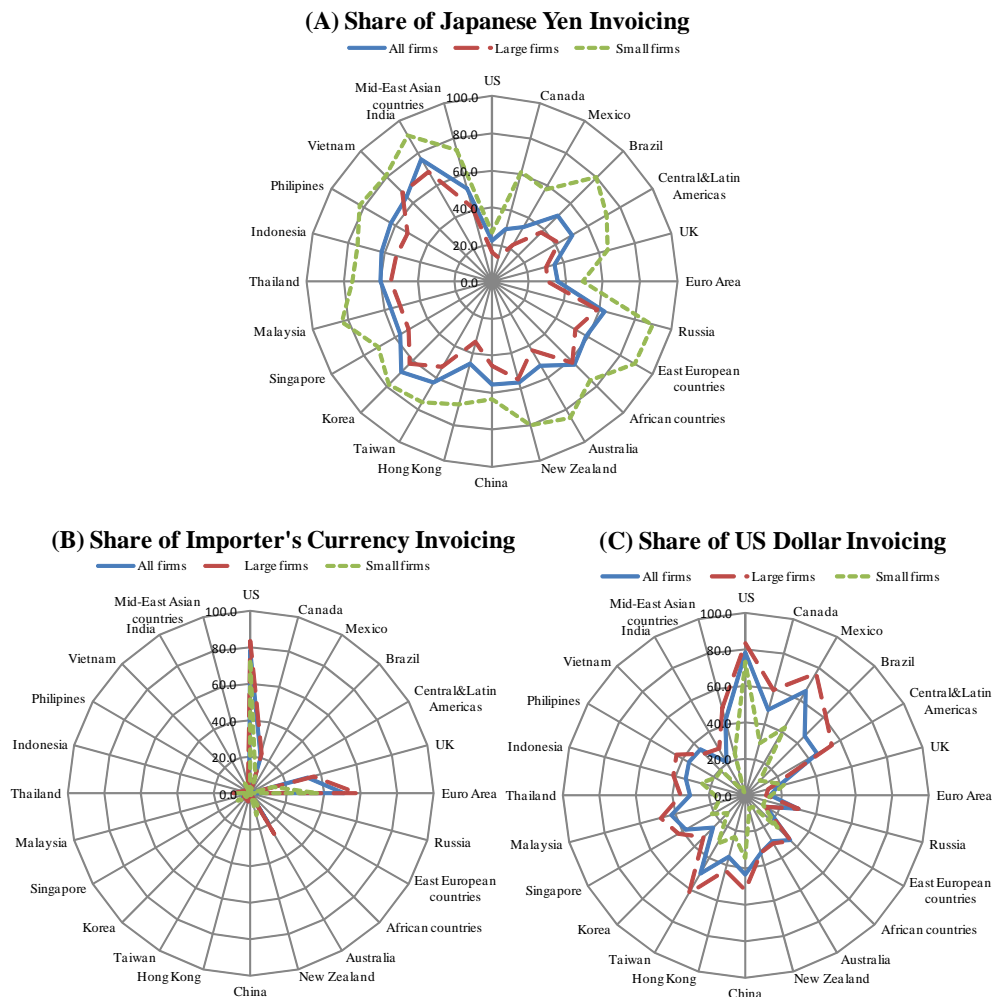
*The Share of Currency Invoicing by Destination*

Figure 4-1 depicts the summary of the results of the invoicing choice by destination.

First, in exports to the United States, 77.9 percent of all manufacturing exports are invoiced in US dollars and 21.8 percent are in the yen.

Second, in exports to the Euro area, 51.0 percent of all manufacturing exports are invoiced in the euro, and 35.3 percent are invoiced in the yen. The share of US dollar invoicing is only 13.6 percent. In contrast, only 30 percent of precision instrument exports are invoiced in the euro and 61.7 percent are invoiced in the yen.

Figure 4-1. Share of Invoicing Currency in Exports by Destination



Source: 2009 RIETI Survey

Third, in exports to other advanced countries (the UK, Canada and Australia), around

20 to 30 percent of all manufacturing exports are invoiced in the importer's currency. However, the US dollar is most frequently used in all manufacturing exports to Canada (48.2 percent), while the share of the yen is the largest in exports to the UK (35.0 percent) and in exports to Australia (52.5 percent).

Finally, in exports to emerging economies including New Zealand, the importer's currency is rarely used for invoicing. Surprisingly, US dollar invoicing accounts for the largest share only in all manufacturing exports to Mexico. In exports to other countries, the share of yen invoicing is the largest and exceeds at least 50 percent.

The results of the currency invoicing share by destination and by type of industry are reclassified into the firm size breakdown data on the destination specific invoicing. Figure 4-1 also presents the firm size breakdown data in terms of the total consolidated sales.

First, in exports to the United States and the Euro area, the share of the importer's currency invoicing is the largest in the case of large size firms. The larger the firm size, the higher the share of the importer's currency is in exports to these two countries. A similar invoicing pattern is observed in exports to other advanced countries, although the most frequently used currency is not necessarily the importer's currency.

Second, in the case of small size firm's exports, the share of yen invoicing is the largest for most destination countries except the United States. In exports to Russia, Eastern Europe, Australia, New Zealand and African countries, the share of yen invoicing is the largest even in large size firm's exports. In exports to North and Latin American countries, however, the US dollar is the most frequently used currency in large size firm's exports.

**Result 4: The share of importer's currency invoicing is the largest in exports to the United States, the Euro area and the UK. In exports to North and Latin American countries, the US dollar is the most frequently used currency in large size firms. In contrast, in exports to other emerging/developing countries, Australia and New Zealand, the share of yen invoicing is the largest even in large size firms.**

Figure 4-1 also shows the results of the invoicing choice by destination and by firm size. First, the yen and the US dollar are mainly used as an invoice currency, while the importer's currency is rarely used except for exports to Thailand. Second, the yen is the most frequently used currency in all manufacturing exports to all Asian countries except the Hong Kong where the share of US dollar invoicing is the largest. In terms of all manufacturing exports, around 55 to 70 percents are invoiced in the yen, while around 25 to 40 percents are invoiced in US dollars.

Figure 4-1 shows how the share of currency invoicing is related to the size of the

sample firm. First, the smaller the firm size, the higher the share of yen invoicing. Second, the larger the firm size, the higher the share of US dollar invoicing is.

**Result 5: In exports to Asian countries, the share of yen invoicing is the largest, while the US dollar invoicing accounts for the second largest share. The Asian local currencies are rarely used in Japanese exports to Asian countries. The larger the firm size, the lower (higher) the share of yen (US dollar) invoicing is.**

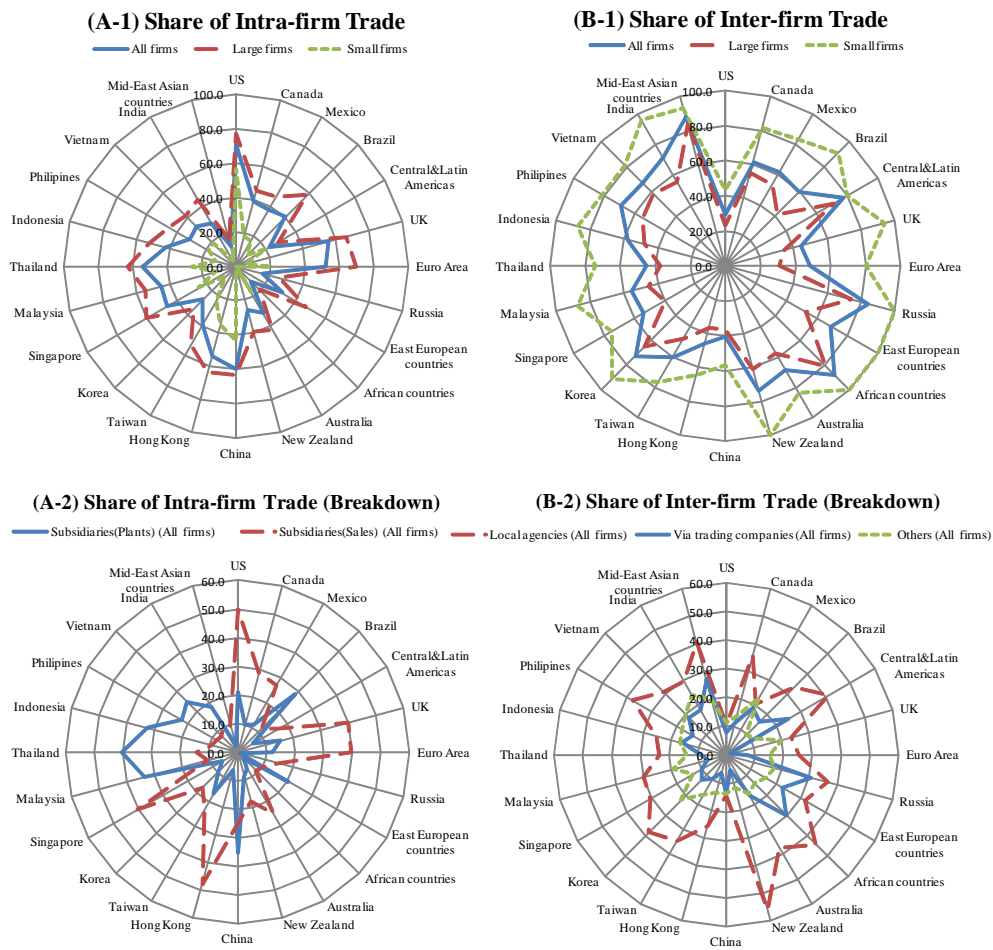
#### 4-2. Trade Channel and Invoice Currency Decision

##### *Intra-Firm Trade or Inter-Firm Trade*

In the questionnaire survey, we investigate the choice of an invoice currency by the type of importers. Five types of importers are (i) local production subsidiaries, (ii) local sales subsidiaries, (iii) local trading companies, (iv) *Sogo Shosha* (Japanese trading companies), (v) others. The type (i) and (ii) are regarded as an *intra*-firm trade, and (iii) through (v) are as an *inter*-firm trade. Tables 4-6(A) and 4-6(B) show which type of importers Japanese firms export their products to in each destination country.

Figure 4-2 reports the results of exports to advanced and developing countries other than Asian countries. First, in all manufacturing exports to the United States, Euro area and the UK, Japanese firms export their products mainly to their local subsidiaries. Even in all manufacturing exports to Canada, Mexico and Brazil, the share of exports to the local subsidiaries is the largest, accounting for around 38 through 41 percent. In these destination countries, *Sogo Shosha* also plays a large role in exports from Japan to each destination. Second, in all manufacturing exports to other developing countries including Australia and New Zealand, local agency (local trading company) is the main importer. Third, the firm size breakdown data clearly shows that the larger the firm size, the stronger tendency Japanese firms have to export to local subsidiaries, which is observed in all destinations.

Figure 4-2. Share of Intra- and Inter-firm Trade in Exports by Destination



Source: 2009 RIETI Survey

Figure 4-2 shows the results of exports to Asian countries including Middle-East countries. First, in all manufacturing exports to Asia, Japanese firms have a strong tendency to export to their local subsidiaries, except for Korea, the Philippines, India and Middle-East countries, where the local agency (local trading company) is the largest importer. Second, the tendency to export to local subsidiaries becomes more evident in the large size firm's exports, where the share of exports to the local subsidiaries is the largest in all Asian countries. In contrast, in the small size firm's exports, the local agency (local trading company) is the largest importer in all Asian countries except China.

**Result 6: In exports to North America, Brazil, the Euro area, the UK, and most Asian countries, intra-firm trade (exports to the local subsidiaries) accounts for the largest share.**



**In exports to other countries, inter-firm trade (exports to non-grouped firms, especially to local trading companies) plays a major role. The Larger the firm size, the stronger tendency the Japanese firms have to conduct intra-firm trade.**

*The Choice of Invoice Currency in Intra- or Inter-Firm Trade*

Table 4-4 shows how the choice of an invoice currency differs across the types of importers in Japanese exports to each destination country.

First, in all manufacturing exports to advanced countries such as the United States, the Euro area, the UK and Australia, the importer's currency is most frequently used. In North and Latin American countries, the share of US dollar invoicing is the largest in exports to the local subsidiaries (intra-firm trade). In Eastern Europe, the share of euro invoicing is the largest in exports to the local subsidiaries, while the yen is the most frequently used currency in Japanese exports to the local subsidiaries. Second, the yen is generally used in inter-firm trade (i.e., exports to local trading companies and *Sogo Shosha*) in all destination countries except the United States and the Euro area where the importer's currency invoicing is dominant.

First, the yen and the US dollar are dominantly used in both intra- and inter-firm trade with Asian countries. The share of local currency invoicing is small and at most 13 percent or less in intra-firm trade. In contrast, the local currency is rarely used in inter firm trade. Second, in exports to local production subsidiaries, the yen is used somewhat more than the US dollar for trade invoicing. In exports to sales subsidiaries, the share of yen invoicing is almost the same level as that of US dollar invoicing. Third, in inter-firm trade, there is a strong tendency to choose yen-invoicing.

**Result 7: The importer's currency tends to be used in intra-firm trade from Japan to developed countries/area. The yen and the US dollar are mainly used in intra-firm trade from Japan to Asian countries.**

**Result 8: The share of yen invoicing is the largest in inter-firm trade, which is more evident in exports to Asia and other developing countries. The share of US dollar invoicing is the second largest, but it is much lower than the corresponding share of yen invoicing.**

Table 4-4. Most Frequently Used Currency in Exports from Japan by Trade Partner

Invoice currency choice in exports from Japan by export channel (all manufacturer)

	Destination											
	US	Canada	UK	Euro Zone	Australia	New Zealand	Other Americas	Other Europe	Africa	China	Thailand	Other Asian
Number of answers	150	44	61	117	63	34	112	65	33	155	110	82
Subsidiaries(plants)	51	6	12	29	5	3	26	8	2	93	62	196
1. JPY	11	1	2	7	2	1	4	3	1	48	36	100
2. USD	---	4	2	2	1	2	20	0	1	42	19	83
3. Euro	0	0	3	---	0	0	2	5	0	0	0	0
4. Importer's currency	40	1	5	20	2	0	0	0	0	3	7	12
5. Others	0	0	0	0	0	0	0	0	0	0	0	0
Subsidiaries(sales)	109	17	27	62	20	7	26	12	4	75	28	247
1. JPY	8	0	6	15	5	3	5	6	2	32	16	115
2. USD	---	10	3	7	5	1	18	2	2	43	9	117
3. Euro	0	0	5	---	1	0	2	4	0	0	0	2
4. Importer's currency	101	7	13	40	9	0	1	0	0	0	3	13
5. Others	0	0	0	0	0	3	0	0	0	0	0	0
Local agencies (no capital)	31	17	17	46	28	20	41	26	15	41	31	342
1. JPY	12	9	8	21	15	13	28	22	11	28	27	243
2. USD	---	5	4	3	10	5	13	3	4	12	4	95
3. Euro	0	0	0	---	0	0	0	1	0	0	0	2
4. Importer's currency	19	3	5	22	3	1	0	0	0	1	0	2
5. Others	0	0	0	0	0	0	0	0	0	0	0	0
Via Japanese trading comp	25	12	8	20	14	4	31	23	15	47	21	201
1. JPY	14	7	5	9	11	3	18	15	13	36	16	157
2. USD	---	2	0	0	3	1	13	6	2	10	5	39
3. Euro	0	1	2	---	0	0	0	2	0	0	0	1
4. Importer's currency	11	2	1	11	0	0	0	0	0	1	0	4
5. Others	0	0	0	0	0	0	0	0	0	0	0	0
Others	30	11	15	29	14	6	32	19	9	39	27	236
1. JPY	13	3	6	14	10	3	20	11	6	22	19	157
2. USD	---	6	3	7	4	2	12	5	3	17	8	73
3. Euro	0	0	3	---	0	0	0	3	0	0	0	2
4. Importer's currency	17	2	3	8	0	0	0	0	0	0	0	4
5. Others	0	0	0	0	0	0	0	0	0	0	0	0

Largest number of answers among 5 categories of main currencies

Second largest number of answers close to the largest (more than 80% in number)

Source: 2009 RIETI Survey

### 4-3. Invoice Currency Decision of Production Subsidiaries

#### *The Choice of an Invoice Currency by Production Subsidiaries*

The questionnaire also asks which invoice currency is used for local sales in each country where the production subsidiaries are located. The local currency invoicing is typically observed in all countries. The currency other than the local currency is sometimes used. Specifically, only the US dollar is used in North and Latin American countries, where around 17 through 25 percent are invoiced in US dollars for their local sales. In the Euro area, the euro is used for local market sales, especially in Eastern Europe countries. Interestingly, in Asian countries, the US dollar is the only foreign currency that used for local sales. On average, around 10 percent is sold in US dollars in Asian local markets.

**Result 9: The local currency is mainly used for local market sales of the Japanese firm's production subsidiaries.**

#### *The Invoicing Choice in Exports of the Local Production Subsidiaries*

In the questionnaires, we have obtained the information on the top three export destinations by the production subsidiaries. First, Table A-8 in Appendix 1 shows that Japanese production subsidiaries are located mainly in Asia. The number of production subsidiaries in the United States and the Euro area are relatively large but far smaller than that in Asia. Second, the production subsidiaries actively export to foreign countries. Asian production subsidiaries, especially subsidiaries in China, have a strong tendency to export to foreign countries.

In Tables from A-9 through A-12 in Appendix 1, we present the destination specific data on the invoicing choice of Japanese production subsidiaries in the United States, the Euro area, China, and Thailand. First, Japanese production subsidiaries in the United States generally use the US dollar in exports to foreign countries including Japan. Only in a few cases, the importer's currency is used for export invoicing. Production subsidiaries in the Euro area also tend to choose euro invoicing in exports to foreign countries except the United States, Russia and African countries. Second, Japanese production subsidiaries in Asia (China and Thailand) have a strong tendency to choose US dollar invoicing in their exports to foreign countries. Even in exports to Japan and the Euro area, the production subsidiaries in Asia tend to choose US dollar invoicing compared to yen or euro invoicing. The use of the Asian currency is very limited in exports of the Asian production subsidiaries to foreign countries.

**Result 10: Japanese production subsidiaries in Asia have a strong tendency to choose US dollar invoicing in their exports to foreign countries.**

*The Invoicing Choice in Exports from Japan to the Production Subsidiaries in Asia*

As Table A-8 reports, Japanese production subsidiaries are divided into two types: the plants focusing on their local market and the exporting plants that export their goods to other countries. Table 4-5 reports most frequently used currency in exports from Japan to these two types of production subsidiaries in Asia, where the upper and lower columns show the number of answers on currency choice by the firms having plants focusing on the domestic market and by the firm having the exporting plants, respectively.



In the upper column, out of total 168 answers of all destinations in Asia, the number of answers that Japanese yen is a main currency in exports from Japan to plants focusing on local markets and exporting plants are 113 firms and 45 firms, respectively. On the other hand, in the lower column, out of total 172 answers of all destinations in Asia, the number of answers that Japanese yen is a main currency decreases to 88 and the number of answers that US dollar is a main currency increases to 74 firms. In some destinations including China, Malaysia, and Indonesia, which are major host countries in Asia for Japanese production subsidiaries, US dollar is the most frequently used currency in export to the export plants.

**Result 11: In exports from Japan to the Japanese subsidiaries in Asia, invoice currency decision depends on types of production subsidiaries. There is a tendency that US dollar is used more as main invoice currency in exports to the exporting plants.**

Table 4-5. Most Frequently Used Currency in Exports from Japan to Plants in Asia

"Main Currency" = Most frequently used currency in exports from Japan to each destination by each trade channel

"Main Currency"	Destination											
	Asia	China	Hong Kong	Taiwan	Korea	Singapore	Malaysia	Thailand	Indonesia	Philippines	Vietnam	India
Number of responded firms	340	93	8	36	23	14	36	62	30	12	14	12
To Subsidiaries(Plant) NOT answered export destination outside country												
Number of answers	168	43	4	17	13	5	18	29	16	5	7	11
1. JPY	113	26	2	12	7	2	11	20	11	4	7	11
2. USD	45	15	2	4	5	3	5	6	4	1	0	0
3. Euro	0	0	0	0	0	0	0	0	0	0	0	0
4. Importer's currency	9	2	0	1	1	0	1	3	1	0	0	0
5. Others	0	0	0	0	0	0	0	0	0	0	0	0
To Subsidiaries(Plant) answered export destination outside country (Japanese Exporting Plants in Asia)												
Number of answers	172	50	4	19	10	9	18	33	14	7	7	1
1. JPY	88	22	4	11	6	7	7	16	3	5	6	1
2. USD	74	27	0	7	2	2	11	13	9	2	1	0
3. Euro	0	0	0	0	0	0	0	0	0	0	0	0
4. Importer's currency	10	1	0	1	2	0	0	4	2	0	0	0
5. Others	0	0	0	0	0	0	0	0	0	0	0	0

 Largest number of answers among 5 categories of main currencies  
 Second largest number of answers close to largest (more than 80% in number)

Source: 2009 RIETI Survey

## 5. Empirics on determinants of currency invoicing

### 5-1. Possible Determinants of Currency Invoicing

Ito, et.al. (2010b) obtained the following possible determinants of currency invoicing through a face-to-face discussion with each firm.

#### (i) Intra- or inter-firm trade

Japanese firms that have a majority of their exports destined for their own local subsidiaries strongly tend to choose the importer's currency invoicing and to manage all exchange rate risks at the finance department of its head office to free their local subsidiaries from any exchange rate risks,. In contrast, in the case that firms have a substantial portion of exports directed toward independent firms including local agencies and local customers and trades via Japanese trading companies (*Sogo Shosha*), Japanese headquarters have less incentive to take the exchange rate risk and, hence, have a tendency to invoice not in the importer's currency but in the yen. Thus, the ownership relationship with trade partners affects the choice of an invoice currency. We propose the following hypothesis to be tested:

**Hypothesis 1: The intra-firm is more likely invoiced in importer's currency. Thus, large share of intra-firm trade in exports decreases the share of Japanese yen invoicing, and increases the share of importers currency invoicing.**

#### (ii) Cost of exchange rate hedging

For many Japanese firms, the hedging cost of currency is one of the most important factors in choosing an invoice currency. The hedging cost of local currencies in Asia and other developing countries tends to be higher than that advanced countries/region mainly due to various regulations and restrictions. Japanese firms will not choose the importer's currency invoicing to the extent that the hedging cost is high between the yen and the importer's currency. Thus, the following hypothesis is typically tested in the empirical analysis of the invoicing choice.

**Hypothesis 2: The higher (lower) the hedging cost between the yen and the importer's currency is, the lower (higher) the use of the importer's currency is as an invoice currency.**

#### (iii) The degree of market competition and differentiation of exporting products

As discussed in previous section, the importer's currency invoicing prevails in exports to advanced countries, which has to do with the PTM behavior of Japanese firms. Specifically, many Japanese firms pointed out that it was too difficult to impose the exchange rate risk on importers in advanced countries due to high degree of competition in the markets. In contrast, a firm that exports differentiated products and has the largest market share in global market answered that its local subsidiaries could manage the exchange rate risk even when the headquarter chose yen-invoicing in exports to the local subsidiaries. Thus, the degree of product differentiation and market competition is an important factor in determining an invoice currency.

This determinant of currency invoicing is conformed to the recent theoretical development of the choice of an invoice currency. The previous studies, such as Giovannini (1988) and Donnenfeld and Zilcha (1991), model the firm's choice of an invoice currency by solving the maximization problem of the firm's expected profit with an uncertainty of exchange rate movements. They show that the choice of an invoice currency depends on the shape of the firm's profit function that is, in turn, conditional on the curvature of the demand function in the destination markets. The more (less) differentiated the firm's export product is, the lower (higher) the elasticity of demand for them is, which leads to the exporter's (importer's) currency invoicing. Thus, it is theoretically shown that the invoicing choice depends on the characteristics of the goods traded, which is consistent with the classical stylized fact 3. Some of machinery firms and electrical component firms in our sample, which export/sell competitive and highly differentiated products in the global market, clearly have a strong position to negotiate their invoicing currency with customers.

**Hypothesis 3: Export products tend to be invoiced in the yen if they are highly differentiated and/or competitive.**

(iv) Exports from Asian production base to the US market

Most of electrical machinery and electrical components firms that choose US dollar invoicing in exports to Asian countries have a particular trade structure in that their production subsidiaries exhibit a strong tendency to export their products to the US market. Under this production/distribution structure, it is found that the firms typically choose US dollar invoicing not only from the local subsidiaries in Asia to the US market but also from Japanese headquarters to the local subsidiaries in Asia, since it is advantageous to use the same currency in both transactions. This aspect is particularly important when considering the second puzzle of the Japan's currency invoicing pattern in exports to Asia. While exports to the United States previously accounted for the largest share in the total exports of Japan and Asian countries, it is now well recognized that intra-regional trade in Asia has become more important for these

countries in recent years. For many Japanese firms, however, the final destination market was still the United States, since growing intra-regional trade was largely driven by processing trade. Whereas such an Asian trade structure is often pointed out, to our knowledge, it has never been tested empirically in the literature on invoicing choice. We attempt empirical examination to take into account this aspect in our cross-sectional analysis.

**Hypothesis 4: Japanese firms tend to choose US dollar invoicing in exports their products to the production subsidiaries mainly in Asia to the extent that the production subsidiaries exhibit higher propensity to export to other countries/region.**

## 5-2. Empirical Results

### *The Explanatory Variables*

We set up the following explanatory variables to empirically investigate the determinants of currency invoicing in Japanese exporting firms.

The first explanatory variables are associated with the determinants (i) "Intra- or inter-firm trade" (Hypothesis 1). We use "Share of exports to sales subsidiaries" and "Share of exports to plants", which are based on the answers of the questionnaire survey. "Share of exports to sales subsidiaries" is a firm  $i$ 's amount of exports to its sales subsidiary in country (or region)  $j$  divided by a firm  $i$ 's amount of total exports to country  $j$ . "Share of exports to plants" is a firm's amount of exports to its production subsidiary in country (or region)  $j$  divided by a firm's amount of total exports to country  $j$ . We also use "Share of intra-firm trade", which is the sum of "Share of exports to sales subsidiaries" and "Share of exports to plants".

The second explanatory variable is related with the determinant (ii) "cost of exchange rate hedging" (Hypothesis 2). We use a bid-ask spread of outright three month forward transactions between the yen and the importing country's currency as a straightforward proxy for the cost of exchange rate hedging.

The third explanatory variables are associated with the determinant (iii) "the degree of market competition and differentiation of exporting products" (Hypothesis 3). We consider two kinds of product differentiation and competitiveness. The first is "Dummy for the company producing differentiated goods defined by Rauch's classification". Rauch (1990) divides products into three types of goods; differentiated products, reference priced goods (for instance in trade journals), and goods with prices that are set on competitive exchanges. We identify whether the company produce and export differentiated goods by matching the company's list of main products in the financial statement to the Rauch's SITC (Standard International Trade

Classification) Rev.2 list. The second is "Dummy for top share goods", which is a proxy for the firm's competitiveness in the global market. The variable takes 1 if the firm produces a product(s) having the largest share in the global market, or 0 if the firm does not have such goods.

The fourth explanatory variable is based on the determinant (iv) "exports from production subsidiaries to other countries/region" (Hypothesis 4). We set a "Dummy for plant to export" based on the firm's answer on the questionnaire survey, which takes 1 if its production base in country/region  $j$  exports goods to other countries/regions, otherwise 0. By taking intersection of this dummy variable with "Share of exports to plants", we represent firm's dependency on exports to the plant in country/region  $j$  that exports its products to third countries/regions.

#### *Estimation on the Determinants of Currency Invoicing*

We empirically test the hypothesis about the determinants of an invoice currency by using the above explanatory variables. We conduct OLS estimation to analyze the determinants of currency invoicing share by export destination, where the dependent variable is each firm's share of Japanese yen invoicing in exports to each destination.

First, the results of estimation including exports to all destinations are presented in Table 5-1. Number of observations is 1,534. As we described in section 4, the share of Japanese yen invoicing is strongly correlated with firm size. Thus, we incorporate "Log of total consolidated sales" into the estimation to control size effects. In columns (1) through (3), the firm size is negative and statistically significant at 1 percent level, which indicates that larger firm have smaller share of Japanese yen invoicing, which is consistent with questionnaire results in section 4.

The coefficient of the forward spread is positive and statistically significant at 1 percent, which strongly suggests the larger the hedging cost of importer's currency is, the less the such a currency is used for trade invoicing, and more Japanese yen is used, which supports Hypothesis 2.

Among two different measures of product differentiation and competitiveness, only dummy for differentiated product defined by Rauch (1999) is positive and statistically significant at 1 percent level while coefficient of dummy for top share goods has negative sign. This suggests that differentiability of products is a determinants of home currency invoicing, which suggest that the company having highly differentiated goods has strong bargaining power in the choice of invoice currency against its final customers, and, however, the firm having a top share goods in the global market does not necessarily successful to exert such bargaining power in the negotiation. These results partly support Hypothesis 3.



Table 5-1. Determinants of Japanese yen invoicing in exports to all countries/region

Destination: US, Canada, Mexico, Euro area, UK, Russia, Australia, China, HongKong, Taiwan, Korea, Phillipines, Vietnam, Singapore, Thailand, Malaysia, Indonesia, and India

Dependent variable: Share of Japanese yen invoicing in total exports from Japan to each destination country/region

Method: OLS regression

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
Log of total consolidated sales	-0.029*** (0.006)	-0.027*** (0.006)	-0.029*** (0.006)	-0.036*** (0.007)	-0.034*** (0.007)	-0.036*** (0.007)
Spread (vis-à-vis JPY, 3 months, April 2009, %)	0.158*** (0.028)	0.159*** (0.028)	0.164*** (0.028)	0.160*** (0.028)	0.161*** (0.028)	0.166*** (0.028)
Dummy for differentiated product (Rauch)	0.319*** (0.031)	0.323*** (0.031)	0.323*** (0.031)	0.344*** (0.041)	0.347*** (0.041)	0.344*** (0.040)
Dummy for top share goods	-0.024 (0.040)	-0.009 (0.040)	-0.013 (0.040)	0.047 (0.041)	0.052 (0.041)	0.048 (0.041)
Share of exports to sales subsidiaries	-0.315*** (0.028)	-0.315*** (0.028)	-0.318*** (0.028)	-0.294*** (0.028)	-0.296*** (0.028)	-0.299*** (0.028)
Share of exports to plants	-0.150*** (0.031)	-0.094*** (0.036)	-0.045 (0.039)	-0.175*** (0.032)	-0.137*** (0.038)	-0.088** (0.041)
Dummy for plant to export		-0.114*** (0.039)	0.082 (0.073)		-0.072* (0.039)	0.116 (0.072)
Dummy for plant to export * Share of exports to plants			-0.300*** (0.094)			-0.290*** (0.092)
Industry dummies	No	No	No	Yes	Yes	Yes
Constant	0.649*** (0.081)	0.628*** (0.082)	0.648*** (0.082)	0.804*** (0.105)	0.765*** (0.107)	0.782*** (0.107)
Observations	1,534	1,534	1,534	1,534	1,534	1,534
Adj. R-squared	0.175	0.179	0.184	0.209	0.210	0.215

1) Estimated coefficient and its standard error, (in parentheses), are reported in each column.

2) Asterisk(s), \*\*\*, \*\*, and \* mean that the estimated coefficients are statistically significant at 1%, 5%, and 10%, respectively.

As for the explanatory variables for intra-firm trade, both the share of exports to sales subsidiaries and the share of exports to plants have statistically significant negative coefficients at 1 percent level although the absolute impact of exports to sales subsidiaries on Japanese yen invoicing is much larger than that of exports to plants. These results are consistent with the Hypothesis 1. We also incorporate dummy for plant to export in the specification (2), and add its intersection with the share of exports to plants to the specification (3). Especially in column (3), intersection term exploits the exports from Japan to overseas exporting production base that in turn exports its products to the third countries/regions. Estimated coefficient of the intersection term is negative and statistically significant at 1 percent level while the share of exports to plant does not have statistically significant coefficient anymore. This result means that exports from Japan to overseas exporting production base largely hinders the Japanese yen invoicing not only in exports from overseas plants to other countries but also in exports from Japanese head office to the overseas plants. This is consistent with our Hypothesis 4.

We also incorporate "Industry dummies", which are dummies for 15 types of industry within manufacturing<sup>10</sup>, into the estimation (4) through (6) in Table 5-1 by taking transport

<sup>10</sup> 15 types of industries are Foods, Textile&Apparel, Chmeical, Pharmacrticals, Oil&Coal Products, Glass&Ceramics, Steel Products, Nonferrous Metals, Metal Products, Machinery, Electrical Machinery, Transport Equipment, Precision Instruments, and Other Products.

equipment as a benchmark type of industry. Even after controlling the industry effect, results in column (4) through (6) are same as those in column (1) through (3).

Next, we divide the sample in Table 5-1 into two categories of export destinations, exports to all Asian countries (Table 5-2) and exports to 5 advanced economies having international currencies with full convertibility (Table 5-3). Results in Table 5-2 are very similar to those in Table 5-1. However, results in Table 5-3 have two different characteristics comparing with all sample estimation in Table 5-1. First, in the estimation using the sample of advanced economies, dummy for top share goods has statistically positive impacts on Japanese yen invoicing in exports from Japan to the advanced economies. Second, dummy for plant to export and its intersection with the share of exports to plants do not have statistically significant coefficients. These results suggest that dummy for top share goods that is a proxy for firm's product competitiveness tends to have positive impact on home currency invoicing only in exports to the market in the advanced economies that is considered as final destination for many of Japanese firms. On the other hand, Japanese subsidiaries in Asian countries are still important as production bases exporting their products to the advanced economies rather than final destination for Japanese firms.

Table 5-2. Determinants of Japanese yen invoicing in exports to Asian countries

Destination: Asian countries (China, HongKong, Taiwan, Korea, Phillipines, Vietnam, Singapore, Thailand, Malaysia, Indonesia, and India)

Dependent variable: Share of Japanese yen invoicing in total exports from Japan to each destination country/region

Method: OLS regression

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
Log of total consolidated sales	-0.032*** (0.007)	-0.030*** (0.007)	-0.034*** (0.007)	-0.041*** (0.008)	-0.038*** (0.008)	-0.042*** (0.008)
Spread (vis-à-vis JPY, 3 months, April 2009, %)	0.063** (0.030)	0.060** (0.030)	0.067** (0.029)	0.061** (0.029)	0.059** (0.029)	0.066** (0.028)
Dummy for differentiated product (Rauch)	0.350*** (0.037)	0.354*** (0.036)	0.350*** (0.036)	0.405*** (0.048)	0.407*** (0.048)	0.399*** (0.047)
Dummy for top share goods	-0.076 (0.047)	-0.052 (0.047)	-0.056 (0.047)	0.017 (0.047)	0.022 (0.047)	0.018 (0.047)
Share of exports to sales subsidiaries	-0.279*** (0.035)	-0.275*** (0.035)	-0.281*** (0.035)	-0.245*** (0.035)	-0.247*** (0.035)	-0.253*** (0.034)
Share of exports to plants	-0.159*** (0.034)	0.069* (0.041)	0.000 (0.045)	-0.175*** (0.034)	-0.126*** (0.042)	-0.056 (0.046)
Dummy for plant to export		-0.167*** (0.042)	0.082 (0.079)		-0.102** (0.043)	0.139* (0.077)
Dummy for plant to export * Share of exports to plants			-0.382*** (0.102)			-0.369*** (0.099)
Industry dummies	No	No	No	Yes	Yes	Yes
Constant	0.764*** (0.097)	0.735*** (0.097)	0.776*** (0.097)	0.940*** (0.123)	0.881*** (0.125)	0.917*** (0.125)
Observations	1,048	1,048	1,048	1,048	1,048	1,048
Adj. R-squared	0.162	0.173	0.183	0.231	0.234	0.244

1) Estimated coefficient and its standard error, (in parentheses), are reported in each column.

2) Asterisk(s), \*\*\*, \*\*, and \* mean that the estimated coefficients are statistically significant at 1%, 5%, and 10%, respectively.

Table 5-3. Determinants of Japanese yen invoicing in exports to advanced economies

Destination: Advanced economies (US, Canada, Euro zone, UK, and Australia)

Dependent variable: Share of Japanese yen invoicing in total exports from Japan to each destination country/region

Method: OLS regression

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
Log of total consolidated sales	-0.020* (0.012)	-0.018 (0.012)	-0.018 (0.012)	-0.029** (0.012)	-0.027** (0.013)	-0.027** (0.013)
Spread (vis-à-vis JPY, 3 months, April 2009, %)	1.223*** (0.441)	1.270*** (0.441)	1.263*** (0.447)	1.278*** (0.442)	1.316*** (0.443)	1.318*** (0.449)
Dummy for differentiated product (Rauch)	0.172*** (0.057)	0.178*** (0.057)	0.178*** (0.057)	0.145* (0.074)	0.152** (0.074)	0.152** (0.075)
Dummy for top share goods	0.122* (0.073)	0.134* (0.073)	0.134* (0.073)	0.171** (0.075)	0.180** (0.075)	0.180** (0.075)
Share of exports to sales subsidiaries	-0.292*** (0.049)	-0.292*** (0.049)	-0.292*** (0.049)	-0.299*** (0.051)	-0.298*** (0.051)	-0.298*** (0.051)
Share of exports to plants	-0.191*** (0.067)	-0.157** (0.071)	-0.160** (0.075)	-0.261*** (0.073)	-0.230*** (0.078)	-0.230*** (0.082)
Dummy for plant to export		-0.131 (0.091)	-0.145 (0.155)		-0.107 (0.092)	-0.104 (0.155)
Dummy for plant to export * Share of exports to plants			0.025 (0.219)			-0.003 (0.218)
Industry dummies	No	No	No	Yes	Yes	Yes
Constant	0.412*** (0.144)	0.381*** (0.146)	0.382*** (0.146)	0.631*** (0.185)	0.591*** (0.188)	0.591*** (0.188)
Observations	424	424	424	424	424	424
Adj. R-squared	0.144	0.146	0.146	0.164	0.165	0.163

1) Estimated coefficient and its standard error, (in parentheses), are reported in each column.

2) Asterisk(s), \*\*\*, \*\*, and \* mean that the estimated coefficients are statistically significant at 1%, 5%, and 10%, respectively.

As we have seen in the section 4, there is local currency invoicing behind lower use of Japanese yen invoicing in exports to advanced economies with international currencies like US, Canada, UK, Euro zone, and Australia. In Table 5-4, we explore the determinants the local currency invoicing by taking the share of local currency as a dependent variable. The results are consistent with those of Table 5-1 and Table 5-3.

Table 5-4. Determinants of local currency invoicing in exports to advanced economies

Destination: Advanced economies (US, Canada, Euro zone, UK, and Australia)

Dependent variable: Share of importer's currency invoicing in total exports from Japan to each destination country/region

Method: OLS regression

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
Log of total consolidated sales	0.008 (0.011)	0.006 (0.011)	0.006 (0.011)	0.015 (0.012)	0.014 (0.012)	0.014 (0.012)
Spread (vis-à-vis JPY, 3 months, April 2009, %)	-4.106*** (0.430)	-4.142*** (0.431)	-4.124*** (0.436)	-4.150*** (0.429)	-4.175*** (0.431)	-4.164*** (0.437)
Dummy for differentiated product (Rauch)	-0.029 (0.055)	-0.033 (0.055)	-0.032 (0.055)	-0.029 (0.072)	-0.033 (0.072)	-0.033 (0.072)
Dummy for top share goods	-0.151** (0.071)	-0.159** (0.071)	-0.160** (0.071)	-0.157** (0.072)	-0.162** (0.073)	-0.163** (0.073)
Share of exports to sales subsidiaries	0.298*** (0.048)	0.298*** (0.048)	0.297*** (0.048)	0.323*** (0.049)	0.323*** (0.049)	0.323*** (0.049)
Share of exports to plants	0.212*** (0.065)	0.189*** (0.069)	0.195*** (0.072)	0.265*** (0.070)	0.246*** (0.075)	0.250*** (0.078)
Dummy for plant to export		0.095 (0.089)	0.129 (0.151)		0.066 (0.089)	0.086 (0.151)
Dummy for plant to export * Share of exports to plants			-0.059 (0.213)			-0.035 (0.211)
Industry dummies	No	No	No	Yes	Yes	Yes
Constant	0.754*** (0.140)	0.776*** (0.142)	0.774*** (0.142)	0.625*** (0.179)	0.649*** (0.182)	0.648*** (0.182)
Observations	426	426	426	426	426	426
Adj. R-squared	0.307	0.307	0.306	0.329	0.329	0.327

1) Estimated coefficient and its standard error, (in parentheses), are reported in each column.

2) Asterisk(s), \*\*\*, \*\*, and \* mean that the estimated coefficients are statistically significant at 1%, 5%, and 10%, respectively.

## 6. Conclusion

In this paper, we present the results of the 2009 RIETI survey, a questionnaire survey sent out to all TSE (Tokyo Stock Exchange) listed firms in the manufacturing industry as of September 2009. The questionnaire covers various issues not only on the firms' invoicing choice by type of industry, destination, and the type of trading partners, but also on the firms' foreign exchange rate risk management. The survey results are investigated by classifying by industry, the firm size, and destination using the annual securities reports of each sample firm. New findings are presented on the exchange rate risk management and the choice of an invoice currency by Japanese exporting firms and their overseas production subsidiaries, which is summarized into 10 results.

Although considered to be an important research theme, there have so far been only a limited number of empirical studies on the issue of firm's invoicing strategy and exchange rate risk managements. The reason is that such information is rarely published or disclosed at a firm level or a disaggregated commodity level. Our findings based on the questionnaire survey will provide useful information for an analysis of the exporter's pricing behavior. Our findings also provide significant implications for further economic integration and monetary arrangements in the Asian region. Finally, further efforts on collecting the data regularly by the questionnaire survey will undoubtedly be necessary so that we will be able to construct the database for a rigorous empirical examination on this issue.

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## Appendix 1. Detailed Data on the Questionnaire Results

Table A-1. Currency invoicing share in exports from Japan to Americas, Europe, Africa, and Pacific

Currency invoicing in exports from Japan to Americas, Europe, Africa, and Pacific (by firm size)											Sample average (Unit: %)	
	Destination											
	US	Canada	Mexico	Brazil	Central & Latin Americas	Euro Area	UK	Russia	East European countries	Australia	New Zealand	African countries
# of answers	168	50	36	51	39	133	65	34	40	70	37	35
<b>A. JPY</b>												
All manufacturers	21.8	29.2	34.0	50.3	50.3	35.3	35.0	63.0	58.9	52.5	56.5	63.3
Large	16.0	13.7	23.0	37.6	41.7	29.7	30.5	58.8	52.0	42.6	54.3	61.5
Medium	23.9	45.0	45.7	60.0	55.6	30.1	17.7	37.5	46.8	50.3	33.2	62.5
Small	26.5	61.4	57.1	80.0	71.6	49.2	65.0	90.0	88.9	84.6	80.0	75.0
<b>B. USD</b>												
All manufacturers	77.9	48.2	66.0	45.6	45.1	13.6	18.5	29.7	13.1	29.1	32.6	34.7
Large	83.5	59.6	77.0	61.7	54.7	11.4	12.7	30.1	12.5	30.6	32.4	35.4
Medium	76.1	30.0	54.3	30.0	44.4	16.4	30.0	50.0	15.9	41.4	66.8	37.5
Small	72.9	29.5	42.9	11.0	14.4	13.9	21.4	11.1	11.1	7.7	7.5	25.0
<b>C. Euro</b>												
All manufacturers	0.3	1.7	0.0	4.1	4.6	51.0	15.7	8.4	28.0	1.3	0.0	2.0
Large	0.7	2.7	0.0	0.6	3.6	58.8	23.6	11.1	35.5	2.4	0.0	3.1
Medium	0.0	0.0	0.0	10.0	0.0	53.2	10.7	12.5	37.3	0.0	0.0	0.0
Small	0.0	0.0	0.0	9.0	14.0	36.9	0.7	0.0	0.0	0.0	0.0	0.0
<b>D. Importer's currency</b>												
All manufacturers	---	20.0	0.0	0.0	0.0	---	32.1	0.0	0.0	18.5	2.7	0.0
Large	---	22.6	0.0	0.0	0.0	---	35.7	0.0	0.1	25.9	0.0	0.0
Medium	---	25.0	0.0	0.0	0.0	---	41.7	0.0	0.0	11.1	0.0	0.0
Small	---	9.1	0.0	0.0	0.0	---	12.9	0.0	0.0	7.7	12.5	0.0
<b>E. Other currencies</b>												
All manufacturers	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	8.2	0.0
Large	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	13.3	0.0
Medium	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: 2009 RIETI Survey

Table A-2. Currency invoicing share in exports from Japan to Asian countries

Currency invoicing in exports from Japan to Asia (by firm size)											Sample average (Unit: %)	
# of answers	Destination											Mid-East countries
	China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippines	Vietnam	India	
A. JPY												
All manufacturers	55.4	69.0	62.5	45.6	56.9	60.1	56.1	61.6	63.0	64.9	76.3	51.9
Large	45.3	62.5	53.3	33.3	52.0	54.7	51.1	53.3	52.6	67.9	68.6	41.5
Medium	60.5	68.9	63.0	44.5	54.0	57.3	45.7	66.7	64.7	41.9	81.3	50.3
Small	63.4	78.9	75.2	68.3	70.5	75.5	84.1	74.9	82.4	80.9	91.0	73.4
B. USD												
All manufacturers	43.7	25.5	35.3	49.4	37.8	30.4	42.4	33.8	35.8	35.1	21.2	42.7
Large	52.4	32.8	42.6	61.9	42.6	35.4	48.4	41.0	43.9	32.1	29.4	49.4
Medium	40.9	25.8	35.7	46.7	43.1	32.5	50.7	27.5	35.3	58.1	18.7	49.1
Small	34.2	13.8	24.0	30.7	21.2	16.7	15.4	25.1	18.8	19.1	1.9	23.4
C. Euro												
All manufacturers	0.5	1.1	0.3	0.0	0.5	0.2	0.3	0.6	0.0	0.0	1.1	4.2
Large	0.4	0.5	0.0	0.0	1.0	0.4	0.5	1.2	0.0	0.0	2.1	6.7
Medium	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Small	1.2	1.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1
D. Importer's currency												
All manufacturers	1.3	4.5	2.4	4.8	4.8	9.4	1.1	4.0	1.4	0.0	1.4	2.4
Large	3.2	4.2	4.1	4.7	4.2	9.5	0.0	4.5	2.9	0.0	0.0	4.9
Medium	0.0	4.2	2.1	8.9	2.9	10.1	3.6	5.8	0.0	0.0	0.0	0.0
Small	0.0	5.4	0.4	0.0	8.4	7.8	0.0	0.1	0.0	0.0	7.1	0.0
E. Other currencies												
All manufacturers	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.3
Large	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.7	0.0	0.0	0.6
Medium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: 2009 RIETI Survey

Table A-3. Share of export channel from Japan to Americas, Europe, Africa, and Pacific

Share of export channel from Japan to Americas, Europe, Africa, and Pacific (all manufacturers, by firm size)		Sample average (Unit: %)											
		Destination											
		US	Canada	Mexico	Brazil	Central & Latin Americas	Euro Area	UK	Russia	East European countries	Australia	New Zealand	African countries
All size	Number of answers	150	44	32	45	35	117	61	31	34	63	34	33
Export channel													
	All overseas subsidiaries (a)+(b)	70.8	38.7	38.1	40.5	22.3	52.1	55.6	16.1	30.9	31.5	26.5	12.2
	(a) Subsidiaries (plants)	20.8	10.0	11.0	28.6	6.0	12.2	15.5	1.0	20.6	6.7	8.8	3.1
	(b) Subsidiaries (sales)	50.0	28.7	27.1	11.8	16.3	39.8	40.1	15.1	10.3	24.7	17.6	9.1
	Local agencies (no capital ties)	10.4	35.6	20.3	33.3	41.3	25.3	23.3	36.7	31.7	37.3	55.9	44.3
	Via Japanese trading companies	7.6	11.6	18.7	16.4	24.9	7.7	1.3	30.7	22.7	16.4	5.6	29.6
	Others	11.0	14.2	22.9	9.8	11.4	15.2	19.8	17.5	15.9	15.8	12.1	13.9
By size													
Large	Number of answers	57	28	22	28	24	52	37	16	18	35	23	21
Export channel													
	All overseas subsidiaries (a)+(b)	77.1	45.4	46.4	58.4	28.6	69.5	66.0	25.7	46.9	42.5	39.3	19.3
	(a) Subsidiaries (plants)	26.5	12.2	16.1	39.3	8.9	18.9	20.3	2.0	27.9	9.3	13.1	4.9
	(b) Subsidiaries (sales)	50.5	33.1	30.4	19.1	19.7	50.6	45.7	23.7	19.1	33.2	26.2	14.4
	Local agencies (no capital ties)	4.2	27.2	20.6	17.9	32.4	12.0	16.3	26.8	15.5	30.1	47.9	45.9
	Via Japanese trading companies	7.4	11.8	13.0	11.8	22.7	4.9	1.6	28.5	26.4	15.8	4.4	25.2
	Others	8.9	12.4	16.0	8.6	12.6	12.0	13.7	14.8	7.9	10.8	4.4	5.3
Medium	Number of answers	49	6	5	8	7	33	12	6	9	17	5	8
Export channel													
	All overseas subsidiaries (a)+(b)	75.2	39.2	20.0	12.5	0.0	55.3	72.9	16.7	22.2	17.6	0.0	0.0
	(a) Subsidiaries (plants)	26.8	0.0	0.0	12.5	0.0	8.5	16.7	0.0	22.2	0.0	0.0	0.0
	(b) Subsidiaries (sales)	48.4	39.2	20.0	0.0	0.0	46.8	56.3	16.7	0.0	17.6	0.0	0.0
	Local agencies (no capital ties)	8.7	34.2	0.0	50.0	52.9	21.7	8.3	16.7	33.3	47.1	80.0	25.0
	Via Japanese trading companies	9.6	10.0	40.0	37.5	32.9	6.6	2.1	50.0	22.2	10.6	0.0	43.8
	Others	6.5	16.7	40.0	0.0	14.3	16.4	16.7	16.7	22.2	24.7	20.0	31.3
Small	Number of answers	45	11	6	10	5	33	13	10	8	12	7	5
Export channel													
	All overseas subsidiaries (a)+(b)	56.6	18.2	16.7	9.0	20.0	20.0	6.2	0.0	0.0	16.7	0.0	0.0
	(a) Subsidiaries (plants)	6.7	9.1	0.0	9.0	0.0	5.2	0.0	0.0	0.0	8.3	0.0	0.0
	(b) Subsidiaries (sales)	49.9	9.1	16.7	0.0	20.0	14.8	6.2	0.0	0.0	8.3	0.0	0.0
	Local agencies (no capital ties)	19.9	54.5	33.3	60.0	60.0	48.8	55.4	60.0	62.5	41.7	57.1	60.0
	Via Japanese trading companies	5.4	10.9	19.2	11.0	20.0	12.9	0.0	19.5	12.5	25.0	12.9	20.0
	Others	18.1	16.4	30.8	20.0	0.0	18.3	38.5	20.5	25.0	16.7	30.0	20.0

Source: 2009 RIETI Survey

Table A-4. Share of export channel from Japan to Asian countries

Share of export channel from Japan to Asian countries (all manufacturers, by firm size)		Sample average (Unit: %)											
		Destination											
		China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippines	Vietnam	India	Mid-East countries
All size	Number of answers	155	131	135	96	93	110	82	77	65	56	65	57
Export channel													
	All overseas subsidiaries (a)+(b)	59.8	27.2	39.6	54.1	46.2	54.7	44.8	42.2	30.9	32.8	28.4	12.2
	(a) Subsidiaries (plants)	35.0	9.7	16.7	6.6	6.1	40.4	33.8	32.7	22.5	24.9	18.4	2.6
	(b) Subsidiaries (sales)	24.8	17.5	22.8	47.6	40.2	14.3	11.0	9.4	8.4	7.9	10.1	9.6
	Local agencies (no capital ties)	14.2	38.3	34.6	25.6	30.5	23.2	29.9	25.1	37.9	30.9	29.7	40.6
	Via Japanese trading company	13.5	12.2	9.7	6.7	9.9	8.6	7.0	16.0	13.5	18.3	17.9	27.2
	Others	13.5	22.2	16.1	13.5	13.4	13.6	19.2	16.7	17.7	20.2	24.0	20.0
By size													
Large	Number of answers	64	56	55	45	43	49	44	40	34	28	36	31
Export channel													
	All overseas subsidiaries (a)+(b)	63.5	34.8	52.2	63.6	60.3	62.7	54.3	52.1	45.3	41.7	44.5	16.2
	(a) Subsidiaries (plants)	32.2	10.7	21.4	4.7	8.3	48.6	44.0	36.8	30.9	29.8	27.7	1.7
	(b) Subsidiaries (sales)	31.2	24.2	30.8	58.9	52.1	14.2	10.4	15.2	14.3	11.9	16.8	14.5
	Local agencies (no capital ties)	7.8	24.1	23.9	16.4	19.3	14.4	22.8	17.4	20.5	21.9	24.3	32.4
	Via Japanese trading company	12.6	14.4	8.6	9.7	8.4	8.5	5.4	13.1	13.8	23.4	15.9	32.3
	Others	14.8	25.2	13.6	8.3	9.9	12.5	15.4	15.2	17.7	13.9	12.8	16.2
Medium	Number of answers	51	40	43	27	27	39	23	22	16	13	17	12
Export channel													
	All overseas subsidiaries (a)+(b)	67.0	32.7	36.7	54.3	41.1	60.2	47.4	44.1	10.9	27.9	11.8	8.3
	(a) Subsidiaries (plants)	44.1	17.0	20.1	11.9	4.1	50.3	27.7	43.2	7.2	27.9	11.8	8.3
	(b) Subsidiaries (sales)	22.9	15.7	16.6	42.4	37.0	9.9	19.7	0.9	3.8	0.0	0.0	0.0
	Local agencies (no capital ties)	8.1	43.7	35.7	23.9	23.3	16.4	20.9	20.0	47.8	19.2	23.8	34.2
	Via Japanese trading company	16.5	6.0	11.6	0.0	17.0	10.8	10.4	26.4	16.3	19.2	23.2	24.2
	Others	8.9	17.7	16.0	21.8	18.5	12.5	21.3	9.5	25.0	33.6	41.2	33.3
Small	Number of answers	41	36	38	25	24	23	16	16	16	16	13	15
Export channel													
	All overseas subsidiaries (a)+(b)	43.3	8.7	23.6	35.5	25.0	25.9	12.5	12.5	18.8	18.8	3.8	6.7
	(a) Subsidiaries (plants)	27.0	0.1	5.7	4.0	4.2	4.3	12.5	6.3	18.8	12.5	0.0	0.0
	(b) Subsidiaries (sales)	16.3	8.6	17.9	31.5	20.8	21.5	0.0	6.3	0.0	6.3	3.8	6.7
	Local agencies (no capital ties)	32.1	53.6	48.0	43.2	57.5	52.2	58.8	50.0	62.5	55.0	50.0	60.0
	Via Japanese trading company	10.9	15.6	9.0	8.4	4.2	4.6	5.9	8.1	9.4	7.2	15.3	17.3
	Others	16.7	22.2	19.5	13.6	13.3	17.4	25.3	29.4	9.4	19.1	30.8	16.0

Source: 2009 RIETI Survey

Table A-5. Currency invoicing choice by trade channel in exports from Japan to Americas, Europe, Africa, and Pacific countries

Percent of number of "main currency," most frequently used currency in exports from Japan to each destination, over total number of answers												
	Destination											
	US	Canada	Mexico	Brazil	Central & Latin Americas	Euro Area	UK	Russia	East European countries	Australia	New Zealand	African countries
Number of answers	150	44	32	45	35	117	61	31	34	63	34	33
<b>Subsidiaries(plants)</b>												
# of answers	51	6	5	17	4	29	12	1	7	5	3	2
1. JPY	21.6	16.7	0.0	23.5	0.0	24.1	16.7	100.0	28.6	40.0	33.3	50.0
2. USD	78.4	66.7	100.0	64.7	100.0	6.9	16.7	0.0	0.0	20.0	66.7	50.0
3. Euro	0.0	0.0	0.0	11.8	0.0	69.0	25.0	0.0	71.4	0.0	0.0	0.0
4. Importer's currency	---	16.7	0.0	0.0	0.0	---	41.7	0.0	0.0	40.0	0.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Subsidiaries(sales)</b>												
# of answers	109	17	11	7	8	62	27	6	6	20	7	4
1. JPY	7.3	0.0	18.2	14.3	25.0	24.2	22.2	50.0	50.0	25.0	42.9	50.0
2. USD	92.7	58.8	72.7	85.7	50.0	11.3	11.1	33.3	0.0	25.0	14.3	50.0
3. Euro	0.0	0.0	0.0	0.0	25.0	64.5	18.5	16.7	50.0	5.0	0.0	0.0
4. Importer's currency	---	41.2	9.1	0.0	0.0	---	48.1	0.0	0.0	45.0	0.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.9	0.0
<b>Local agencies (no capital ties)</b>												
# of answers	31	17	8	14	19	46	17	12	14	28	20	15
1. JPY	38.7	52.9	50.0	85.7	63.2	45.7	47.1	83.3	85.7	53.6	65.0	73.3
2. USD	61.3	29.4	50.0	14.3	36.8	6.5	23.5	16.7	7.1	35.7	25.0	26.7
3. Euro	0.0	0.0	0.0	0.0	0.0	47.8	0.0	0.0	7.1	0.0	0.0	0.0
4. Importer's currency	---	17.6	0.0	0.0	0.0	---	29.4	0.0	0.0	10.7	5.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Via Japanese trading companies</b>												
# of answers	25	12	8	11	12	20	8	12	11	14	4	15
1. JPY	56.0	58.3	37.5	54.5	75.0	45.0	62.5	58.3	72.7	78.6	75.0	86.7
2. USD	44.0	16.7	62.5	45.5	25.0	0.0	0.0	41.7	9.1	21.4	25.0	13.3
3. Euro	0.0	8.3	0.0	0.0	0.0	55.0	25.0	0.0	18.2	0.0	0.0	0.0
4. Importer's currency	---	16.7	0.0	0.0	0.0	---	12.5	0.0	0.0	0.0	0.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Others</b>												
# of answers	30	11	14	10	8	29	15	10	9	14	6	9
1. JPY	43.3	27.3	50.0	80.0	62.5	48.3	40.0	60.0	55.6	71.4	50.0	66.7
2. USD	56.7	54.5	50.0	20.0	37.5	24.1	20.0	30.0	22.2	28.6	33.3	33.3
3. Euro	0.0	0.0	0.0	0.0	0.0	27.6	20.0	10.0	22.2	0.0	0.0	0.0
4. Importer's currency	---	18.2	0.0	0.0	0.0	---	20.0	0.0	0.0	0.0	0.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: 2009 RIETI Survey

Table A-6. Currency invoicing choice by trade channel in exports from Japan to Asian countries

Percent of number of "main currency," most frequently used currency in exports from Japan to each destination, over total number of answers

	Destination											
	China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippines	Vietnam	India	Mid-East countries
Number of answers	131	135	96	93	110	82	77	65	56	65	57	
<b>Subsidiaries(plants)</b>												
# of answers	93	23	36	10	12	62	35	30	16	17	15	2
1. JPY	51.6	56.5	63.9	20.0	58.3	58.1	51.4	46.7	37.5	29.4	73.3	50.0
2. USD	45.2	30.4	30.6	70.0	41.7	30.6	45.7	43.3	56.3	64.7	20.0	50.0
3. Euro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. Importer's currency	3.2	13.0	5.6	10.0	0.0	11.3	2.9	10.0	6.3	0.0	6.7	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Subsidiaries(sales)</b>												
# of answers	75	37	44	53	48	28	14	14	9	9	10	9
1. JPY	42.7	64.9	52.3	32.1	37.5	57.1	57.1	35.7	44.4	77.8	60.0	33.3
2. USD	57.3	29.7	40.9	60.4	54.2	32.1	42.9	57.1	55.6	22.2	30.0	66.7
3. Euro	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0
4. Importer's currency	0.0	5.4	6.8	5.7	8.3	10.7	0.0	7.1	0.0	0.0	0.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Local agencies (no capital ties)</b>												
# of answers	41	63	65	33	34	31	32	23	26	20	21	25
1. JPY	68.3	73.0	66.2	60.6	85.3	87.1	68.8	69.6	76.9	75.0	71.4	68.0
2. USD	29.3	23.8	32.3	39.4	11.8	12.9	31.3	30.4	23.1	25.0	28.6	32.0
3. Euro	0.0	1.6	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4. Importer's currency	2.4	1.6	0.0	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Via Japanese trading companies</b>												
# of answers	47	28	29	10	16	21	14	23	16	19	20	26
1. JPY	76.6	82.1	79.3	70.0	68.8	76.2	71.4	82.6	87.5	78.9	90.0	65.4
2. USD	21.3	17.9	20.7	20.0	25.0	23.8	28.6	8.7	12.5	21.1	10.0	30.8
3. Euro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8
4. Importer's currency	2.1	0.0	0.0	10.0	6.3	0.0	0.0	8.7	0.0	0.0	0.0	0.0
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Others</b>												
# of answers	39	45	33	20	18	27	24	21	19	18	22	16
1. JPY	56.4	68.9	60.6	45.0	88.9	70.4	62.5	71.4	68.4	72.2	86.4	37.5
2. USD	43.6	28.9	39.4	50.0	11.1	29.6	37.5	28.6	31.6	27.8	13.6	37.5
3. Euro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5
4. Importer's currency	0.0	2.2	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5
5. Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: 2009 RIETI Survey

Table A-7. The Choice of an Invoice Currency in Local Sales

Which currency is most frequently used for sales to local customers?

Country/region where sample firms have subsidiaries (plants)	Number of firms to answer (A)	Local currency		USD		Euro		JPY	
		# of answers (B)	(B)/(A) (%)	# of answers (C)	(C)/(A) (%)	# of answers (D)	(D)/(A) (%)	# of answers (E)	(E)/(A) (%)
Americas (total)	70	68	97.1	2	2.9				
US	49	49	100.0						
Canada	6	5	83.3	1	16.7				
Mexico	4	3	75.0	1	25.0				
Brazil	13	13	100.0						
Central & Latin Americas	4	3	75.0	1	25.0				
Europe (total)	41	36	87.8			5	12.1		
Euro Area	25	25	100.0						
UK	10	9	90.0			1	10.0		
Russia	0								
East European countries	6	2	23.3			4	66.7		
Pacific & Africa (total)	9	7		2	22.2				
Australia	4	4	100						
New Zealand	3	2	66.7	1	33.3				
African countries	2	1	50.0	1	50.0				
Asia (total)	303	271	89.4	30	9.9			1	0.3
China	80	76	95.0	4	5.0				
Korea	18	15	83.3	2	11.1				
Taiwan	28	24	85.7	4	14.2				
Hong Kong	8	6	75.0	2	25.0				
Singapore	14	9	64.2	4	28.6				
Thailand	52	49	94.2	3	5.7				
Malaysia	29	25	86.2	4	13.7				
Indonesia	30	28	93.3	2	6.6				
Philippines	15	12	80.0	3	20.0				
Vietnam	15	14	93.3	1 <sup>1)</sup>	6.6			1 <sup>1)</sup>	6.6
India	12	12	100.0						
Mid-East countries	2	1	50.0	1	50.0				

1) One company in Vietnam answered USD and JPY as currencies most frequently used for sales to local customers.

Source: 2009 RIETI Survey



Table A-8. Destination of exports from overseas plants

Destination of exports from overseas plants

Country/region where sample firms have subsidiaries (plants)	Number of firms having subsidiaries (plants)	# of firms to answer destination	Export destination							
			Japan	Americas	US	Europe	Euro Area	Asia	China	Pacific & Africa
Americas (total)	76	28	6	36	9	9	7	5	2	0
US	49	15	4	19	---	7	5	4	2	0
Canada	6	3	0	3	3	0	0	1	0	0
Mexico	4	3	0	3	2	0	0	0	0	0
Brazil	13	7	2	11	4	2	2	0	0	0
Central & Latin Americas	4	0	0	0	0	0	0	0	0	0
Europe (total)	45	21	4	5	4	19	9	5	1	1
Euro Area	25	10	3	3	3	7	---	4	1	1
UK	12	7	1	2	1	5	5	1	0	0
Russia	1	0	0	0	0	0	0	0	0	0
East European countries	7	4	0	0	0	7	4	0	0	0
Pacific & Africa (total)	9	5	0	2	1	0	0	4	0	3
Australia	4	3	0	1	0	0	0	4	0	2
New Zealand	3	2	0	1	1	0	0	0	0	1
African countries	2	0	0	0	0	0	0	0	0	0
Asia (total)	330	184	103	41	40	33	31	169	19	5
China	85	55	35	17	17	15	14	25	---	0
Korea	19	11	8	2	1	2	1	11	3	0
Taiwan	33	19	7	1	1	1	1	27	8	1
Hong Kong	9	6	4	1	1	2	2	5	3	0
Singapore	14	9	3	3	3	3	3	9	0	1
Thailand	58	33	20	9	9	5	5	29	1	2
Malaysia	33	17	9	1	1	1	1	20	1	0
Indonesia	30	14	7	2	2	2	2	23	1	0
Philippines	16	10	5	3	3	1	1	10	2	0
Vietnam	16	8	5	2	2	1	1	7	0	0
India	14	1	0	0	0	0	0	1	0	0
Mid-East countries	3	1	0	0	0	0	0	2	0	1

Source: 2009 RIETI Survey

Table A-9. Invoice currency choice in exports from plants in US by destination

Invoice currency choice in exports from plants in US to each destination

[# of "main currency," most frequently used currency in exports from plants in US to each destination / total number of answers]

Destination	Japan	US	Canada	Mexico	Brazil	Central & Latin America	Euro Area	UK	Russia	East Europe	Australia	New Zealand	Africa
# of answers	4	---	7	7	3	2	4	2					
A. JPY		---											
B. USD	[4/4]	---	[7/7]	[6/7]	[2/3]	[1/2]	[4/4]	[1/2]					
C. Euro		---											
E. Importer's currency		---		[1/7]	[1/3]	[1/2]		[1/2]					

Destination	Asia	China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippine	Vietnam	India	Mid-East Asia
# of answers	3	2						1					
A. JPY													
B. USD	[3/3]	[2/2]						[1/1]					
C. Euro													
E. Importer's currency													

Source: 2009 RIETI Survey

Table A-10. Invoice currency choice in exports from plants in Euro zone by destination

Invoice currency choice in exports from plants in Euro Area to each destination

[# of "main currency," most frequently used currency in exports from plants in Euro Area to each destination / total number of answers]

Destination	Japan	US	Canada	Mexico	Brazil	Central & Latin America	Euro Area	UK	Russia	East Europe	Australia	New Zealand	Africa
# of answers	3	2					---	2	1	3			1
A. JPY							---						
B. USD		[2/2]					---		[1/1]				[1/1]
C. Euro	[3/3]						---	[1/2]		[3/3]			
E. Importer's currency							---	[1/2]					

Destination	Asia	China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippine	Vietnam	India	Mid-East Asia
# of answers	3	1											2
A. JPY													
B. USD													
C. Euro	[3/3]	[1/1]											[2/2]
E. Importer's currency													

Source: 2009 RIETI Survey

Table A-11. Invoice currency choice in exports from plants in China by destination

Invoice currency choice in exports from plants in China to each destination

[# of "main currency," most frequently used currency in exports from plants in China to each destination / total number of answers]

Destination	Japan	US	Canada	Mexico	Brazil	Central & Latin America	Euro Area	UK	Russia	East Europe	Australia	New Zealand	Africa
# of answers	35	17					14		1		1		
A. JPY	[14/35]						[1/14]						
B. USD	[20/35]	[17/17]					[8/14]		[1/1]		[1/1]		
C. Euro	[1/35]						[5/14]						
D. Chinese Yuan													
E. Importer's currency													

Destination	Asia												
		China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippine	Vietnam	India	Mid-East Asia
# of answers	24	---	4	4	9	2	1	1	1				2
A. JPY	[2/24]	---	[1/4]		[1/9]								
B. USD	[20/24]	---	[3/4]	[3/4]	[7/9]	[2/2]	[1/1]	[1/1]	[1/1]				[2/2]
C. Euro		---											
D. Chinese Yuan	[2/24]	---		[1/4]	[1/9]								
E. Importer's currency		---											

Source: 2009 RIETI Survey

Table A-12. Invoice currency choice in exports from plants in Thailand by destination

Invoice currency choice in exports from plants in Thailand to each destination

[# of "main currency," most frequently used currency in exports from plants in Thailand to each destination / total number of answers]

Destination	Japan	US	Canada	Mexico	Brazil	Central & Latin America	Euro Area	UK	Russia	East Europe	Australia	New Zealand	Africa
# of answers	19	9					5				1		
A. JPY	[5/19]						[1/5]						
B. USD	[11/19]	[9/9]					[2/2]						
C. Euro							[2/2]						
D. Thai Baht	[3/19]										[1/1]		
E. Importer's currency													

Destination	Asia												
		China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippine	Vietnam	India	Mid-East Asia
# of answers	22	1	2	2	4	5	---	1	3	1	2	1	
A. JPY	[1/22]		[1/2]				---						
B. USD	[17/22]	[1/1]	[1/2]	[2/2]	[4/4]	[4/5]	---	[1/1]	[1/3]		[2/2]	[1/1]	
C. Euro							---						
D. Thai Baht	[4/22]					[1/5]	---		[2/3]	[1/1]			
E. Importer's currency							---						

Source: 2009 RIETI Survey