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Has Regional Economic Integration Promoted Yen Invoiced Trade?

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Internationalization of the Yen in Asia: Has Regional Economic Integration Promoted Yen Invoiced Trade?

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Abstract

By investigating various data at both customs and firm level, we present the new evidence of Japanese firms' invoice currency choice. Contrary to stylized facts, we demonstrate that Japanese firms tend to choose the U.S. dollar or importer's currency for trade invoicing in Japanese exports to advanced countries, irrespective of difference in industry characteristics or product differentiation, while they choose the yen invoiced transactions in exports to Asian countries. More interestingly, Asia-based Japanese subsidiaries tend to use mainly the yen and U.S. dollar for trade invoicing in their trade with Japanese head offices and group companies. On the other hand, in Asia-based subsidiaries' trade with other countries excluding Japan, the yen is rarely used, even in intra-firm trade, and the U.S. dollar is dominantly used for trade invoicing. Even though Japanese subsidiaries increase their intra-firm trade with other Asia-based group companies, the use of the yen in Asia will not be growing. Instead, the use of the U.S. dollar will be increasing. These findings have significant policy implications for further use of the yen in the process of Asian economic integration.

JEL Classification: F23, F31, F33

Keywords: Yen internationalization; invoice currency; intra-firm trade; Asian economic integration; pricing-to-market (PTM); regional economic integration

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1. Introduction

Asian countries have experienced a rapid and high economic growth for the last several decades. China's economic growth has been particularly remarkable since the early 2000s, with its growing trade surplus and foreign reserve accumulation. In contrast, Japanese economy has suffered from prolonged deflation and very slow economic growth for the last few decades. Despite this different economic performance, China and Japan are now the second and the third largest countries in the world, respectively, in terms of GDP, and Asia is expected to produce 50 percent of the world GDP in the year 2050. Given such a large role of China and Japan in the Asian region, economic cooperation between China and Japan needs to be strengthened for further development of regional countries.

Asian countries have been integrated through trade and foreign direct investment, especially through active operations of multinational companies in Asia. However, not the local currency but the U.S. dollar is typically used in Asian financial transactions. Even in intra-Asian trade, the U.S. dollar is said to be generally chosen as an invoice (contract) currency. In recent years, China started to internationalize the renminbi (RMB) in trade transactions. The question is whether RMB-invoiced trade transactions have been increasing and whether RMB can take the place of the U.S. dollar in the future. To get a clue to answer these questions, it will be informative and useful to learn the experience of the Japanese yen for its internationalization process.

This chapter discusses the international use of the yen focusing on a role of the trade invoice currency. First, we observe to what extent the yen is used in Japanese trade by collecting the publicly available data. We show that the pattern of invoice currency choice in Japanese trade conflicts with the empirical regularity, so-called "stylized facts."

Second, to investigate why the invoice currency choice differs between Japan and other advanced countries, we look at the firm-level data of invoice currency choice. The firm-level information is particularly important in the context of Asian economic integration where foreign multinational companies play an important role in intra-regional trade. However, it is very hard to obtain the information on which currency is used in trade of multinational companies. This chapter uses the results of a large-scale questionnaire survey conducted by Research Institute of Economy, Trade and Industry (RIETI) to discuss the invoice currency choice of Japanese head offices and their overseas subsidiaries.

Third, we particularly focus on the invoice currency choice in intra-regional trade in Asia, especially intra-firm trade. Since such firm-level data is not publicly

available, our analysis has significant implications on the currency choice under global value chains that are lively discussed in the existing studies. We reveal that Japanese overseas subsidiaries in Asia tend to use the yen mainly in trade with Japan, but U.S. dollar invoiced trade is also large, or even larger than yen invoiced trade.

The remainder of this chapter is as follows. Section 2 reviews the theory of international currency and presents the stylized facts of invoice currency choice. Section 3 discusses whether the choice of invoice currency in Japanese exports and imports is consistent with the stylized facts. Section 4 shows the industry breakdown data on the invoice currency choice in Japanese exports and imports. Section 5 investigates the firm-level choice of invoice currency in Japanese exports, and Section 6 discusses the overseas subsidiaries' choice of invoice currency. Finally, Section 7 concludes this chapter.

2. Trade Invoice Currency: Preconditions and Stylized Facts

2.1 Preconditions for International Currency

If a specific currency is used in international transactions, the currency can be regarded as an “international currency”. To become the international currency, a currency is required to meet the following two principal conditions.¹

First, without confidence in political stability of the country concerned, it is hard to use the currency for international transactions. The confidence in the value of the currency is also necessary when using the currency for international transactions. Japan meets both conditions. Although Japan has experienced prolonged recession for more than two decades, the yen is typically regarded as a “safe currency” by investors. Indeed, the exchange rate of the yen has been fluctuating, sometimes very rapidly and substantially. But, once the United States or European countries fall into a critical situation, investors in the world tend to purchase the yen as a safe currency.

Second, if a country imposes strict capital controls or financial regulations, the country's currency will not be used for international transactions. Thus, a country needs to maintain the convertibility of its current and capital accounts. The country also has well-developed financial markets so that the currency can be easily financed or procured. Japan started to liberalize domestic financial markets from the mid-1970s and accelerated the liberalization process from the mid-1980s. In December 1980, the Foreign Exchange and Foreign Trade Control Law was revised to liberalize all foreign exchange transactions

¹ The following discussion is based on Sato (1999).

in principle. The May 1984 Yen/Dollar Agreement specified substantial liberalization measures to be adopted. In April 1998, the revised Foreign Exchange and Foreign Trade Law was implemented, which brought the first major step of the Japanese “Big Bang” and completely deregulated domestic and foreign capital transactions and foreign exchange operations.²

These liberalization processes were expected to facilitate the international use of the yen, especially yen-invoiced trade. However, as we will see in Section 3, the yen is less used for Japanese trade than the U.S dollar.

2.2 Stylized Facts

In the 1970s and early 1980s, a number of studies investigated the empirical regularities of the invoice currency choice. Although the data is not readily available, these studies presented the following stylized facts:³

1. Trade of manufactured products between advanced countries tends to be invoiced in the exporter’s currency.⁴
2. Trade of manufactured products between advanced and developing countries tends to be invoiced in the advanced country’s currency or, to a lesser extent, in a major international currency such as the U.S. dollar.⁵
3. Differentiated products such as machinery products tend to be invoiced in the exporter’s currency. More homogeneous products such as crude oil and primary commodities are typically invoiced in the international currency such as the U.S. dollar.⁶

The above stylized facts indicate that the invoice currency choice is conditional on which country is a trading partner and on the characteristics of goods traded. The question is whether Japan’s currency invoicing pattern conforms to the stylized facts.

² Kawai (1996) presents a brief summary of the Japan’s financial liberalization process. See also Tavlas and Ozeki (1992).

³ Ligthart and da Silva (2007) make a good literature review concerning the stylized facts. See also Kawai (1996) and Sato (1999) for a good summary and discussion on the empirical regularities of the choice of invoice currency.

⁴ This empirical regularity is known as the “Grassman’s Law” (Grassman, 1973, 1976).

⁵ This stylized fact is based on the empirical work of Grassman (1973) and Page (1977, 1981).

⁶ See McKinnon (1979) for further details.

3. Evidence from Japanese Exports and Imports

3.1 Evidence from Japanese Exports

Figures 1 and 2 present the share of the yen and the U.S. dollar in Japanese exports and imports, respectively, from 1980 to 2016. Japanese Ministry of Finance started to publish semi-annually the share of invoice currency in Japanese exports and imports from the second half of 2000.⁷ Although industry- or commodity-level data is not published, the information on the choice of invoice currency by destination or source country (region) is available. The four destination and source countries (regions) are as follows: the world, the United States, European Union (EU), and Asia.

***** Figure 1 around here. *****

Let us look at Figure 1(a) that shows how the choice of invoice currency in Japanese exports to the world has changed from 1980 to 2016. First, the U.S. dollar invoiced share is higher than the yen invoiced share. Second, we cannot observe any clear upward trend in the share of yen invoicing. The share of yen-invoiced transactions rose from 28.9 percent in 1980 to 42.0 percent in 1983, but the share declined to 33.4 percent in 1987. The fall of the yen invoiced share from 1983 is typically explained by the pricing-to-market (PTM) behavior of Japanese exporters.⁸ Specifically, during the rapid yen appreciation period from 1985 to 1987, Japanese firms stabilized the export price in the U.S. market by choosing the U.S. dollar as an invoice currency. From the mid-1980s to 2016, the share of yen invoicing has stayed within a narrow range from 33 to 41 percent in Japan's exports to the world. As of 2016, 51.0 percent of Japanese exports to the world are invoiced in U.S. dollars, while 37.0 percent are invoiced in the yen.

The above observation indicates that Japanese invoice currency choice conflicts with the stylized fact 1. Previous studies also argued that Japanese invoice currency choice differed markedly from the other advanced countries. Specifically, the United States typically choose the U.S. dollar invoiced transactions in both exports and imports.

⁷ The data is available from the website of the Trade Statistics of Japan, Ministry of Finance from the second half of 2000 (<http://www.customs.go.jp/toukei/shinbun/trade-st/tuukahappyou.htm>). The data for 1999 or before was published from Ministry of International Trade and Industry (MITI) and Bank of Japan.

⁸ See Krugman (1987), Marston (1990), and Tavlas and Ozeki (1992).

Before the introduction of the Euro in 1999, European countries also had a strong tendency to use their own currency in their exports.

In fact, as shown in Figure 1(b), Japanese exports to the United States are mainly invoiced in U.S. dollars. Figure 1(c) also indicates that only 30.5 percent of Japanese exports to European Union (EU) are invoiced in the yen. Although not reported in Figure 1(c), 53.9 percent are invoiced in European currencies, mainly the Euro, in 2016.⁹ Thus, this observation strongly suggests that Japanese firms tend to choose local currency invoicing in exports to advanced countries, which is consistent with the PTM behavior of Japanese exporting firms,¹⁰ and again conflicts with the stylized fact 1.

More interesting evidence is the share of yen invoiced exports to Asia. Figure 1(d) shows that the share of yen invoiced exports has not increased for the last twenty-nine years in Japanese exports to Asia. Specifically, the share of the yen rose to about 50 percent or more in the early 1990s and in the first-half of 2010s. But, the share of the yen declined to a large extent from 49.2 percent in 2010 to 43.2 percent in 2015, while the share of the U.S. dollar increased from 48.7 in 2010 to 52.2 in 2015. In 2016, the share of U.S. dollar invoicing somewhat declined to 48.6 percent, while the share of the yen invoicing rose to 46.1 percent. But, the share of U.S. dollar invoicing still exceeds that of yen invoicing, which also conflicts with the stylized fact 2.

Why is the role of the yen smaller in Asia than that of the U.S. dollar? Until around the mid-1990s, when a question of yen internationalization was lively debated, the use of the yen was expected to grow as the invoice currency in Asia, especially if intra-firm trade increased between Japanese parent companies and Asia-based local subsidiaries through active foreign direct investment by Japanese firms.¹¹ In particular, since most exports from Japan to Asia were regarded as capital goods and differentiated products, the share of yen invoicing was expected to increase steadily. Although Japanese firms have in practice built a regional production network for the last few decades, however, the U.S. dollar has been used more than the yen in Japanese exports to Asia. To consider why the share of yen invoiced exports is so small, it is necessary to investigate the far more detailed data on the invoice currency in Japanese exports by industry.

⁹ The share of Euro, UK pound, and Swedish krona is 47.9 percent, 5.6 percent, and 0.4 percent, respectively, in the first-half of 2016. See the website of the Trade Statistics of Japan, Ministry of Finance (<http://www.customs.go.jp/toukei/shinbun/trade-st/tuukahappyou.htm>).

¹⁰ For an empirical analysis of the PTM behavior and the exchange rate pass-through in Japanese exports, see Knetter (1989, 1993), Marston (1990), Takagi and Yoshida (2001) and Parsons and Sato (2008).

¹¹ Kawai (1996), for instance, pointed out that the international use of the yen would naturally grow as Japan's economic interdependence with Asia deepened through intra-industry trade, foreign direct investments and various types of financial flows.

3.2 Evidence from Japanese Imports

Let us turn to the share of invoice currency in Japanese imports. Figure 2(a) presents the share of the yen and the U.S. dollar in Japanese imports from 1980 to 2016. First, in Japanese imports from the world, the share of the yen increased gradually from 2.4 percent in 1980 to 25.5 percent in 2002, but it declined to 20.8 percent in 2014. In 2016, the share of the yen increased again to 26.8 percent. But, the U.S. dollar is the most used currency in Japanese imports and its share is 66.7 percent in 2016.

*** Figure 2 around here.***

Why is the U.S. dollar share very high in Japanese imports? It is well known that Japan has imported a large amount of crude oil and raw materials that tend to be invoiced in U.S. dollars as suggested by stylized fact 3. However, Japan's import pattern has structurally changed in recent years with a substantial increase in imports of manufactured products including both finished goods and intermediate inputs from foreign countries. Figure 2(c) shows the invoice currency choice of Japanese imports from EU countries, where the yen share is surprisingly high. As of 2016, 59.2 percent of Japanese imports from EU countries are invoiced in the yen. Although not reported in Figure 2(c), the euro share is only 27.8 percent.¹² This evidence indicates that trade of manufacturing goods between advanced countries is less likely to be invoiced in U.S. dollars. Instead, either exporter's or importer's currency tends to be used in trade between advanced countries.

It must be noted, however, that stylized fact 1 tells us that exporter's currency tends to be used in trade between advanced countries. Figure 2(c) does show that the importer's currency (i.e., the yen) is largely used in Japanese imports from EU countries. In addition, Figure 1(c) also shows that 47.9 percent of Japanese exports to EU countries are invoiced in the importer's currency (i.e., euro), while only 30.5 percent is invoiced in the yen. Thus, contrary to the stylized fact 1, the evidence from Japanese invoice currency choice suggests that the importer's currency tends to be used in trade between advanced countries, which is a typical PTM behavior discussed in the literature.

Figure 2(d) shows, however, that more than 70 percent of imports from Asia are invoiced in U.S. dollars and the share of yen invoicing has never exceeded 30 percent.

¹² The share of euro in Japanese imports from EU countries is not presented in Figure 2(c). The data is taken from the Trade Statistics of Japan, Ministry of Finance. As of 2016, the U.S. dollar share is only 9.9 percent in Japanese imports from EU countries.

In 2016, only 25.9 percent of Japan's imports from Asia are invoiced in the yen, and 70.4 percent are invoiced in U.S. dollars. It is confirmed that the U.S. dollar is still dominantly used in trade between Japan and Asia.

This dominant use of the U.S. dollar is unlikely to be explained by the stylized facts. As the regional integration has been deepening and production network has been developed, trade of manufacturing products has been growing between Japan and Asian countries. According to stylized fact 2, manufacturing products tend to be invoiced in the advanced country's currency in trade between the advanced country and the developing country. In addition, Japanese manufacturing subsidiaries have increased their overseas production in Asia, and intra-firm trade of manufacturing products including both finished goods and intermediate inputs has grown considerably between Japan and Asia. It should be natural to expect further use of the yen in trade between Japan and Asia.

Thus, our main objective is to investigate why the U.S. dollar is used more than the yen in Japanese trade with Asia. To discuss why the use of the yen is relatively small in Asia, we will observe the industry breakdown data of the invoice currency choice in Section 4. We then investigate the firm-level invoice currency choice in Section 5 and after, the data of which is obtained from the questionnaire survey studies.

4. Japan's Invoice Currency Choice by Industry

To analyze the industry-level choice of invoice currency in Japanese exports and imports, let us look at the industry-breakdown data published by the Bank of Japan (BOJ). BOJ publishes only December data from 1999 to the present.¹³ We observe both the December 2015 and 1999 data and check whether the industry-level invoicing behavior has changed over time.

4.1 Industry-level Currency Choice in Japanese Exports

Table 1 presents the industry-breakdown data of invoice currency choice as of December 2015. First, the share of yen invoiced exports is generally much lower than that of U.S. dollar invoiced exports in all industries except General Machinery. In exports of

¹³ BOJ collects the export price data when cargo is loaded in Japan at the customs clearance stage, and the free on board (FOB) prices at the Japanese port of exports are surveyed. Information on invoice (contract) currency choice for each transaction is collected by the survey. Import price data is also collected in a similar way. See the BOJ website (https://www.boj.or.jp/en/statistics/pi/cgpi_2010/index.htm/) for further details.

Textiles, Chemicals & Related Products, and Metals & Related Products, the share of U.S. dollar invoicing exceeds 70 percent. Even in exports of Electric & Electronic Products and Transportation Equipment, which are generally considered differentiated products, the yen invoiced share is only 36.0 percent and 29.8 percent, respectively. Thus, stylized fact 3 does not necessarily hold in Japanese machinery exports. Only in the case of General Machinery exports, the share of yen invoicing is 59.4 percent, which is consistent with the stylized fact 3.

*** Table 1 around here.***

Second, most Japanese exports are invoiced in only three currencies: the yen, U.S. dollar, and euro. In exports of Transportation Equipment, however, other currencies account for 10.5 percent, which suggests that Japanese firms tend to choose the importer's currency in their exports of Transport Equipment to advanced countries, which is literally a PTM behavior.

Third, the invoicing behavior has not changed much from 1999 to 2015, but the share of yen invoicing has increased to some extent in most industries (Table 2). The question of why the yen invoicing share has increased is worth investigating, and it will be discussed in the subsequent sections.¹⁴

*** Table 2 around here.***

4.2 Industry-level Currency Choice in Japanese Imports

Let us next look at the invoice currency share in Japanese imports. As of December 2015, 91.3 percent of imports of Petroleum, Coal & Natural Gas, which accounts for 30 percent of Japanese total imports, are invoiced in U.S. dollars (Table 1). As of December 1999, 100 percent of the above imports are invoiced in U.S. dollars (Table 2). Although the U.S. dollar share has declined somewhat, it is safe to say that the invoice currency choice in Japanese imports is consistent with stylized fact 3. Table 1 also shows that 88.1 percent of imports in Metals & Related Products are invoiced in foreign currencies as of December 2015.

In Japanese imports of three major machinery industries (General Machinery, Electric Machinery, and Transport Equipment), 33–37 percent are invoiced in the yen, while more than 60 percent are invoiced in foreign currencies (Table 1). More

¹⁴ See also Ito *et al.* (2016b) for an analysis of more disaggregated data.

interestingly, the share of yen invoicing is higher in Japanese imports of Transport Equipment than in the corresponding exports. The share of yen invoicing between exports and imports is not very different even in the Electric Machinery. This result is quite interesting, because stylized fact 1 says that trade of machinery exports between advanced countries tends to be invoiced in the exporter's currency. Again, the yen invoicing share has increased from 1999 to 2015 in imports of Japanese three major machinery industries.

5. Firm-Level Invoice Currency Choice in Japanese Trade

We have so far observed the invoice currency choice of Japanese exports and imports at a country level and at an industry level. We have shown that the invoice currency choice of Japanese exports and imports conflicts with the stylized facts. Japanese currency invoicing pattern differs markedly from the invoicing pattern of other advanced countries. But, due to data availability limitations, we have not yet investigated sufficiently why the U.S. dollar is more used in Japanese trade than the yen, especially in trade with Asian countries.

In this section, we investigate the firm-level invoice currency choice mainly focusing on Japanese exports. Previous studies conducted the questionnaire survey with Japanese head offices in 2009 and in 2013 to obtain the firm-level information on their invoicing choice by industry/commodity and by export destination.¹⁵ We utilize their findings and information on firm-level invoice currency choice, and attempt to discuss why the U.S. dollar is more used than the yen in Asia.

5.1 Invoice Currency Choice of Japanese Head Offices' Exports to the World

Figure 3 presents the share of invoice currency in Japanese Head Offices' exports to the world. This chapter reports a simple arithmetic average of the shares of invoice currency answered by sample firms. However, the arithmetic average figures do not take into account the export size of sample firms, which tends to distort the actual share of invoice currency. To reveal the actual share of invoice currency, Figure 3 also reports the weighted average share of invoice currency by using the information on the amounts of

¹⁵ See Ito *et al.* (2010, 2013, 2016a) for the details of their questionnaire survey studies. Questionnaires were sent out to 920 firms in September 2009 and to 962 firms in September 2013 by postal mail in cooperation with Research Institute of Economy, Trade, and Industry (RIETI), Japan. They finally received responses from 227 firms by December 2009 and 185 firms by December 2013.

firms' foreign sales.¹⁶

*** Figure 3 around here.***

When looking at the simple arithmetic average data of All Manufacturing exports, the share of yen invoicing (48.2 percent) is higher than that of U.S. dollar invoicing (42.1 percent) in the 2009 survey, whereas the share of U.S. dollar invoicing (49.1 percent) becomes higher than that of yen invoicing (41.8 percent) in the 2013 survey. This evidence suggests that the share of yen invoicing (U.S. dollar invoicing) has been declining (rising) from 2009 to 2013, which is supported by the data on the invoice currency share of “duplicated sample firms” that answered the questionnaires of both 2009 and 2013 surveys. The share of invoice currency is very similar between the arithmetic average and duplicated sample firms.

Let us next observe the weighted average data on the invoice currency share. The share of yen invoicing in terms of weighted average is only 28.7 percent in the 2009 survey, and the share becomes much lower (21.9 percent) in the 2013 survey. On the other hand, the weighted average share of U.S. dollar invoicing is 54.1 percent in the 2009 survey, and becomes higher (62.1 percent) in the 2013 survey. This evidence suggests that the larger the firm size, the higher the share of U.S. dollar invoicing is. Large-size firms tend to have more subsidiaries in foreign countries than small size firms, and hence the large size firms tend to conduct intra-firm trade. In intra-firm trade, Japanese head offices do not have a strong incentive to pass through exchange rate risk to their own overseas subsidiaries. Instead, Japanese head offices are likely to choose the importer's currency invoicing so that their subsidiaries can avoid taking exchange rate risk. In contrast, smaller firms with a few or no overseas subsidiaries have a stronger tendency to avoid exchange rate risk and hence to choose the yen invoiced exports. Thus, the weighted average share of yen invoicing does reflect the actual invoice currency choice of Japanese exports.

5.2 Head Offices' Exports to Advanced Countries and Asian Countries

Figure 4 presents the invoice currency share in head offices' exports to advanced countries. Even though all figures are the simple arithmetic average share, the share of

¹⁶ The amount of foreign sales is not in practice equal to that of exports. But, as long as using the firm level data, it is reasonable to use the amount of foreign sales, because it is usually very hard to obtain the firm-level export amount data.

yen invoicing is far smaller than that of foreign currency invoicing. In exports to the United States, the U.S. dollar share is 78–80 percent, which indicates that stylized fact 3 does not hold in Japanese exports to the United States. In exports to Euro area, about 50 percent are invoiced in the euro, while 30–35 percent are invoiced in the yen. In exports to UK, the share of the UK pound is 32.1 percent in the 2009 survey and 29.3 percent in the 2013 survey, though this information is not reported in Figure 4. The UK pound plus euro account for 47–48 percent, and the yen accounts for 35–37 percent. Thus, we may conclude that Japanese exports to advanced countries are mainly invoiced in the importer's currency, implying the strong PTM behavior of Japanese firms.

*** Figure 4 around here.***

Figure 5 shows the invoice currency share in head offices' exports to selected Asian countries. First, according to the 2009 survey, 55 percent are invoiced in the yen in exports to China, and more than 60 percent are invoiced in the yen in exports to Korea, Taiwan, and Thailand. Second, the share of the yen declined in the 2013 survey. In exports to China, the yen accounts for 44.6 percent, while the U.S. dollar accounts for 47.1 percent. In exports to other Asian countries, the share of the U.S. dollar increased to 36–46 percent, and the share of the yen is somewhat higher than that of U.S. dollar. The above observation suggests an increase in U.S. dollar invoiced exports to Asia, though the share of the yen is still somewhat higher than that of U.S. dollar invoicing.

*** Figure 5 around here.***

Why did the yen-invoicing share fall in Japanese head offices' exports to Asian countries? This fall may be due to a decline in business performance of Japanese firms. For example, up to the mid-2000s, Japanese major electrical machinery makers played a large role in purchasing intermediate inputs for their final goods production. As long as Japanese major machinery makers are final buyers along production chains, trade of intermediate input goods tends to be invoiced in the yen. In recent years, however, business performance of Japanese major machinery makers has clearly declined, while other country's makers such as Apple and Samsung become a large buyer in Asian supply chains. Non-Japanese buyers do not have an incentive to use the yen for their trade invoicing. Instead, the U.S. dollar tends to be chosen for trade invoicing in Asia, especially when the U.S. machinery makers are the final buyer along production chains or when the final export market is the United States.

6. Invoice Currency Choice of Japanese Overseas Subsidiaries

6.1 Currency Choice in Intra-firm Trade

Let us next look at the invoice currency choice in exports and imports of Japanese overseas subsidiaries. Since regional production and supply chains are driven by active operations of multinational companies, our analysis of subsidiary's invoicing choice has important implications for the yen internationalization in the regional integration process. We rely on the results of questionnaire surveys with Japanese overseas subsidiaries conducted by RIETI in 2010 and 2014.¹⁷ As will be shown and discussed below, the yen is used only in Asia-based subsidiary's trade with Japan, and the U.S. dollar is largely used in their trade with other countries, even in intra-Asian trade.

Figure 6 presents the invoice currency choice of Asia-based subsidiary's trade with Japan. Subsidiaries generally use either the yen or U.S. dollar in trade with Japanese head offices and group companies, i.e., in intra-firm trade. The share of the yen declined and that of the U.S. dollar increased from the 2010 survey to the 2014 survey. More specifically, in Asia-based subsidiary's imports from Japan, the yen is used more if exporters are Japanese head offices. But, in Asia-based subsidiary's exports to Japan, the yen is used more if importers are group companies, whereas the U.S. dollar is used more than the yen especially when subsidiaries export to Japan.

*** Figure 6 around here.***

Japanese *Sogo Shosha* (large trading company) is also a trading partner for Asia-based subsidiaries. *Sogo Shosha* used to play a major role in Japanese exports and imports. With its own large foreign exchange position for both buying and selling, *Sogo Shosha* could manage foreign exchange risk relatively easily and efficiently. Since the U.S. dollar

¹⁷ Ito, *et al.* (2011, 2015a, 2015b) conducted the questionnaire survey in cooperation with RIETI, and sent out the questionnaires to 16,020 and 18,932 Japanese subsidiaries in August 2010 and November 2014, respectively. 1,479 and 1,640 subsidiaries responded to the questionnaires conducted in 2010 and 2014, respectively. They obtained the product level information (i.e., the name of products traded and which currency is used for the product), and collected the information on who is the trading partner, a group company (including a parent company) or other non-related company, for each product or intermediate input traded, which enables the distinction of invoicing choice between intra-firm trade and arm's length trade.

has been the most used currency in Japanese exports and imports, *Sogo Shosha* tends to own a large position of the U.S. dollar. Thus, it is said that the U.S. dollar is generally used if Japanese firms export or import through *Sogo Shosha*. However, Figure 6 shows that the choice of invoice currency in Asia-based subsidiary's imports from *Sogo Shosha* is very similar to that in imports from Japanese head office. In addition, *Sogo Shosha* plays only a minor role in Japanese trade in recent years. Although not reported in Figure 6, only one fifth of Asia-based subsidiary's imports from Japan are through *Sogo Shosha*, and three quarters of Asia-based subsidiaries imports from Japan are intra-firm trade.¹⁸

Figure 7 shows the invoice currency choice of Asia-based subsidiary's trade with other countries (excluding Japan). Obviously, the U.S. dollar is typically chosen in their trade with other countries, irrespective of whether the trading partner is group companies, foreign companies, or customers. In both intra-firm trade and arm's length trade, the U.S. dollar tends to be used in Asia-based subsidiary's trade with other countries.

*** Figure 7 around here.***

6.2 Implications for the Use of Local Currencies in Asia

Why do Asia-based subsidiaries choose not the local currency but the U.S. dollar in their exports to other countries excluding Japan? Asian currencies are typically considered a “minor” currency, because most Asian countries impose strict capital controls and are reluctant to internationalize their currency. In intra-Asian trade, exporters and importers tend to avoid using minor currencies and to choose “major” currency such as the U.S. dollar as an invoice currency.

In Asia-based subsidiary's trade with Japanese head offices and group companies, the subsidiaries have two choices, either the yen or the U.S. dollar, as an invoice currency for their trade with Japan. Suppose an Asia-based subsidiary imports intermediate inputs from the Japanese head office, and exports its finished products to the head office. If the amounts of exports to Japan are the same as those of imports from Japan, the subsidiary can avoid exchange rate risk irrespective of the choice of invoice currency, which is called “natural hedge.”

The choice of invoice currency depends on the destination market. If the final destination of the subsidiary's export products is the Japanese market, both the subsidiary

¹⁸ For further details, please see Ito *et al.* (2015b). Since the volume of Asia-based subsidiary's exports to Japan through *Sogo Shosha* is very small, we do not report the invoice currency choice when subsidiary's export partner is *Sogo Shosha*.

and its head office are willing to choose the yen in their intra-firm trade. However, if Japanese head office re-exports the imported products to the U.S. market, for instance, the U.S. dollar can be rationally chosen even in intra-firm trade between the Asia-based subsidiary and the Japanese head office. The reason is that in exports to the United States, the U.S. dollar is typically chosen, as we discussed in the previous sections.

Thus, as Japanese firms have expanded overseas operations of their subsidiaries, it becomes more important to consider the choice of invoice currency along production or supply chains, where the final destination market determines the invoice currency. As long as the final destination market is the United States or the final buyer is the U.S. companies, it would be rational to choose the U.S. dollar as an invoice currency along production and supply chains. Even though intermediate input goods are actively traded in Asia, the U.S. dollar tends to be chosen in the intra-Asian trade, given the final destination market is the United States.

7. Concluding Remarks

By investigating various data at both customs and firm levels, we have revealed the new evidence of Japanese firms' invoice currency choice.

1. Japanese firms tend to choose the U.S. dollar or the importer's currency in Japanese exports to advanced countries, irrespective of differences in industry characteristic or product differentiation.
2. Japanese firms tend to choose the yen in exports to Asian countries, though the share of the yen is lower than that of the U.S. dollar in recent years.
3. Asia-based subsidiaries tend to use mainly the yen and U.S. dollar in their trade with Japanese head offices and group companies. But, the share of the yen declined in recent years.
4. In Asia-based subsidiaries' trade with other countries excluding Japan, the yen is rarely used, even in intra-firm trade. The U.S. dollar is dominantly used.

The above findings have policy implications for the future role of the yen and the Asian local currencies in trade transactions. To facilitate the further use of the yen in Asia, Japan needs to increase its imports from Asian countries. Indeed, Japan has expanded its imports of manufacturing goods from Asian countries. But, if most of imported intermediate inputs are used for final goods production destined for the U.S.

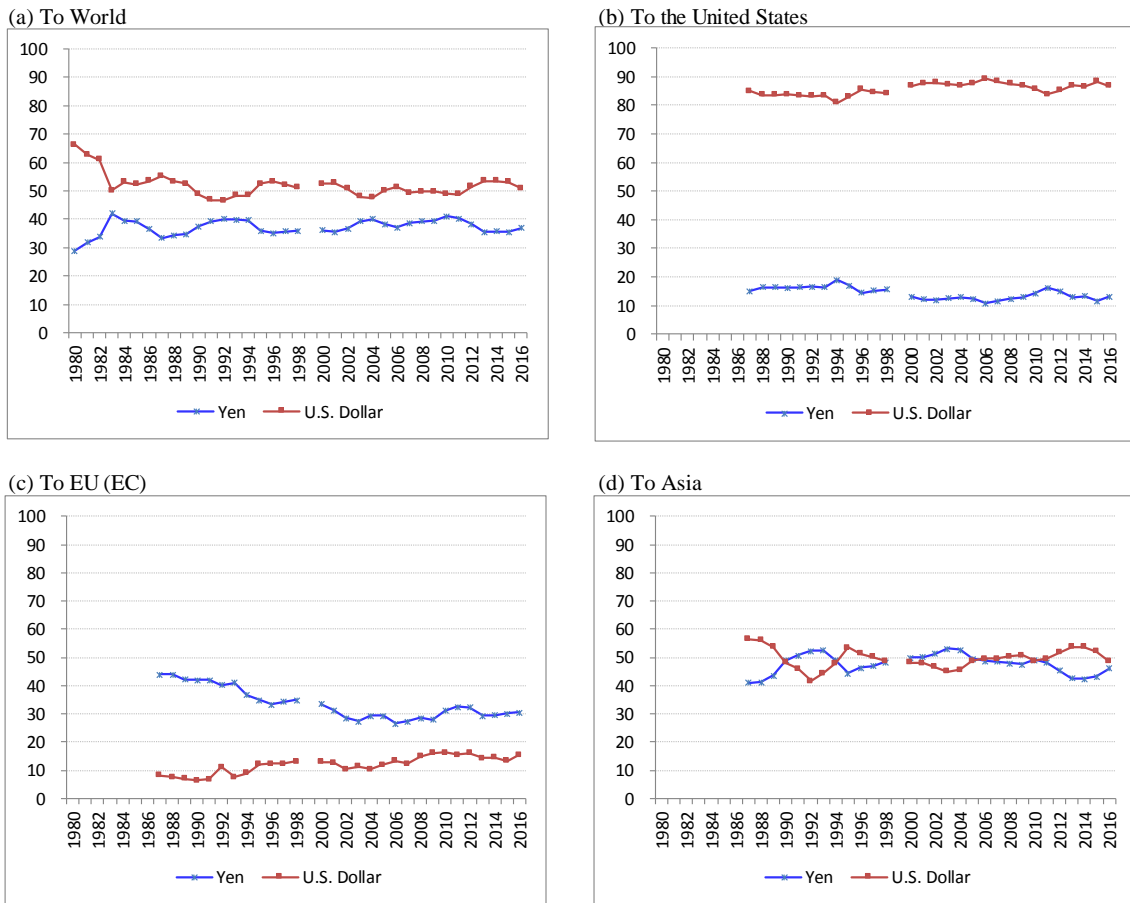
market, the U.S. dollar tends to be chosen in Asia. Similarly, although Chinese government attempts to promote the RMB internationalization, the further use of RMB would not be expected unless China increased its role of final destination market for neighboring Asian countries. Of course, China's domestic demand is potentially very large, and there should be room for the further use of RMB in Asian trade. From the viewpoint of Japanese firms, however, the use of RMB has not grown significantly. As shown in Figure 7, the sum of the yen and the U.S. dollar shares increases from the 2010 survey to the 2013 survey in three out of four figures. Only in Figure 7-A2, the sum of the yen and U.S. dollar shares declines from 83.2 percent to 80.7 percent. Thus, even though we present only the evidence from Japanese multinational companies, our findings have important implications for the invoice currency choice of foreign multinationals operating in Asia. Despite the rapid economic integration in Asia, foreign multinationals are less likely to increase the use of RMB significantly in their trade in Asia.

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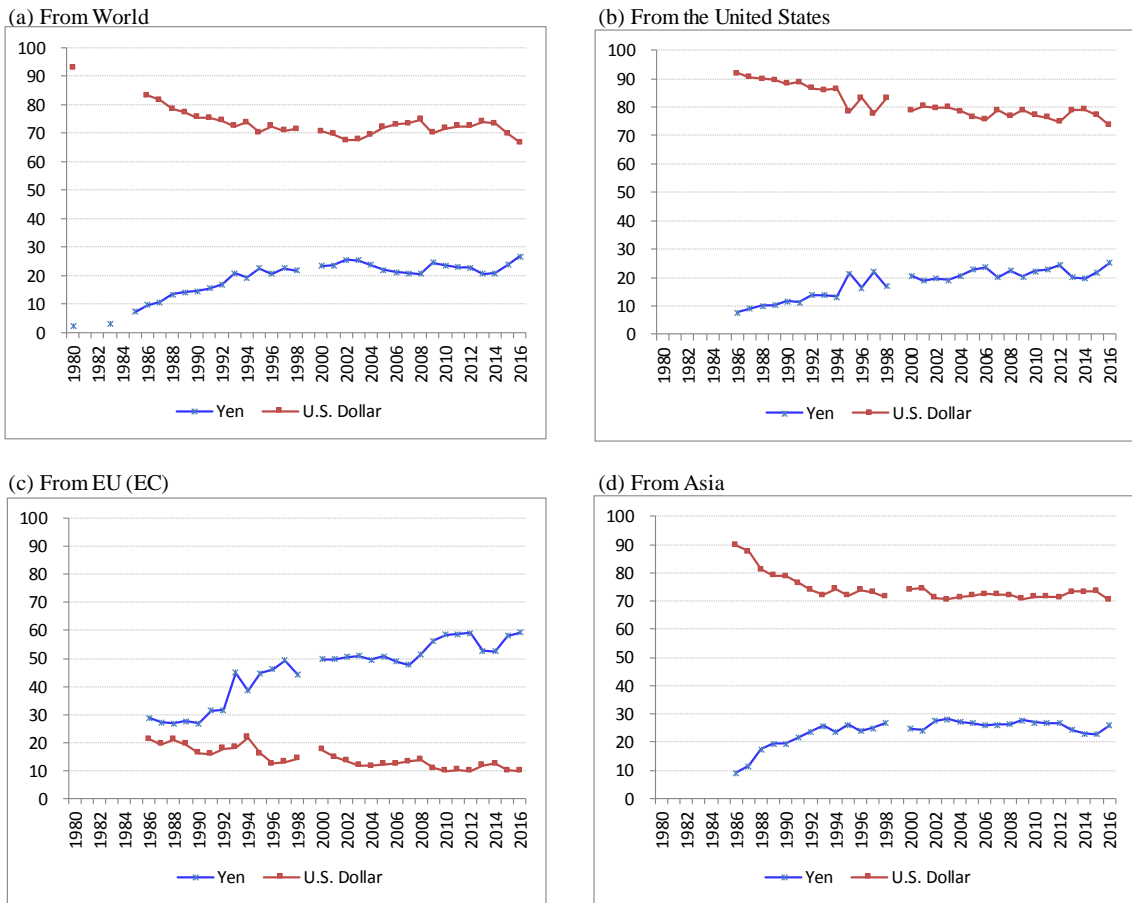
Figure 1. Invoice Currency Choice in Japanese Exports



Notes: The data for 1999 is not available. The September data is used for 1992–97, the March data for 1998, and the second half of the year data for 2000–2016.

Sources: Bank of Japan, *Yushutsu Shinyojo Tokei (Export Letter of Credit Statistics)*; MITI, *Yushutsu Kakunin Tokei (Export Confirmation Statistics)*; MITI, *Yushutsu Hokukosho Tukadate Doko (Export Currency Invoicing Report)*; MITI, *Yushutsu Kessai Tsukadate Doko Chosa (Export Settlement Currency Invoicing)*; the website of the Trade Statistics of Japan, Ministry of Finance.

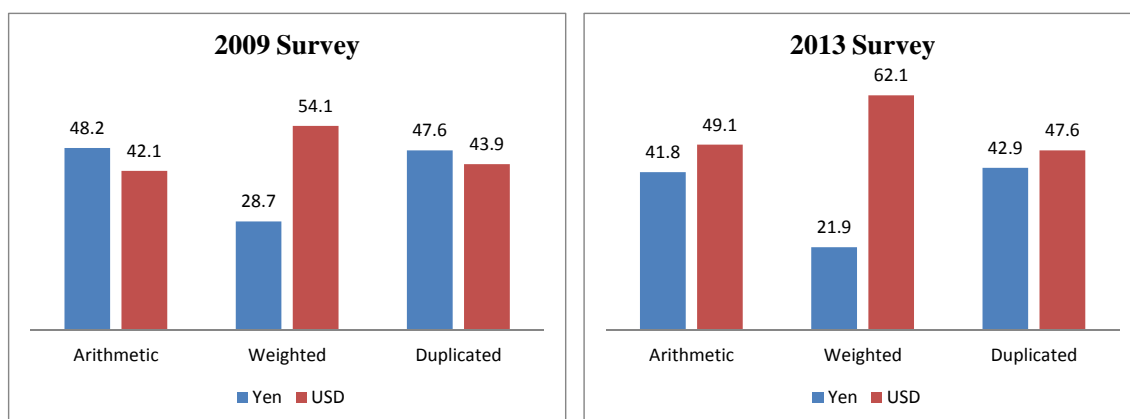
Figure 2. Invoice Currency Choice in Japanese Imports



Notes: The data for 1999 is not available. For imports from the world, the data on yen invoicing is not available for 1981, 1982 and 1984, and the data on US dollar invoicing is not available for 1981–85. The 1986 data is the fiscal year data. The September data is used for 1992–97, the March data for 1998, and the second half of the year data for 2000–2016.

Sources: MITI, *Yunyu Shonin Todokede Hokokusho (Import Approval Notification Report)*; MITI, *Hokokushorei ni Motozuku Hokoku (Report Based on Report Guidance)*; MITI, *Yunyu Hokoku Tokei (Import Report Statistics)*; MITI, *Yunyu Hokukosho Tukadate Doko (Import Currency Invoicing Report)*; MITI, *Yunyu Kessai Tsukadate Doko Chosa (Import Settlement Currency Invoicing)*; the website of the Trade Statistics of Japan, Ministry of Finance.

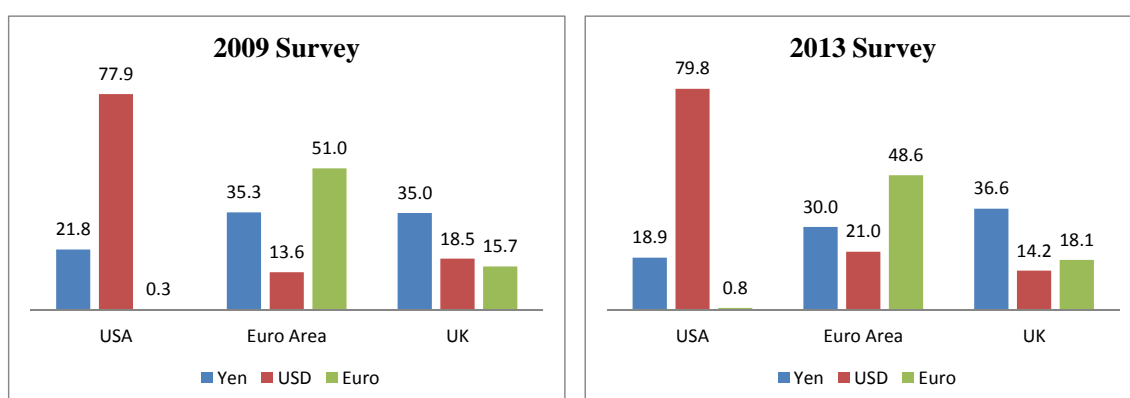
Figure 3. Invoice Currency Choice in Japanese Head Offices' Exports to the World: All Manufacturing (%)



Note: Weighted average is calculated as average of invoicing currency share of all responded firms weighted by amount of foreign sales in FY2008 or FY2012 of each firm. "Duplicated" indicates the sample firms that answered questionnaires of both 2009 and 2013 surveys.

Source: Ito *et al.* (2016a).

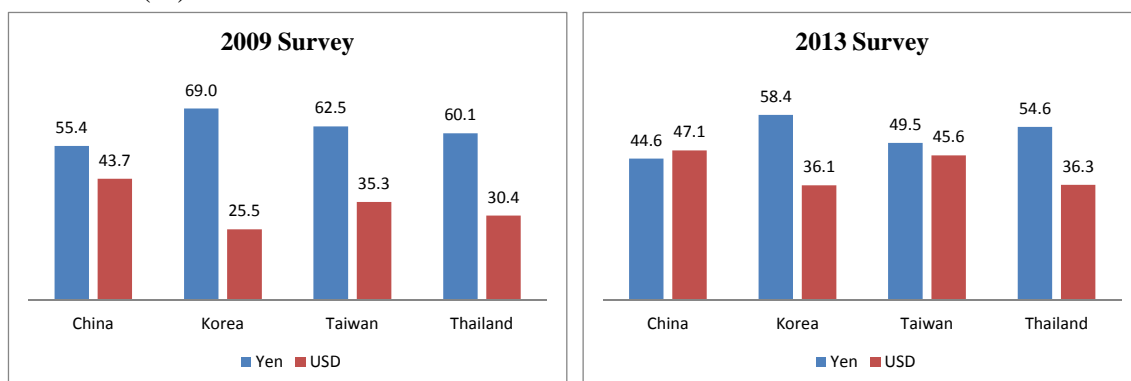
Figure 4. Invoice Currency Choice in Japanese Head Offices' Exports to Advanced Countries: All Manufacturing (%)



Note: Simple arithmetic average share of invoice currency choice of sample firms.

Source: Ito *et al.* (2016a).

Figure 5. Invoice Currency Choice in Japanese Head Offices' Exports to Selected Asian Countries (%)

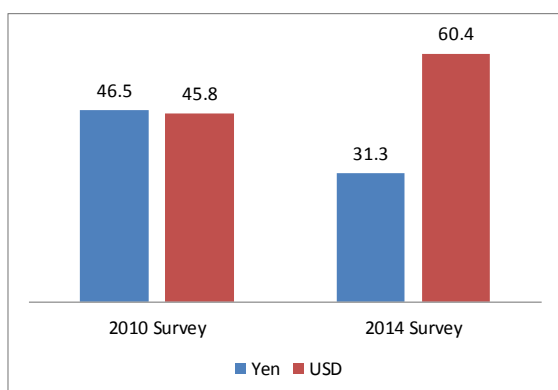


Note: Simple arithmetic average share of invoice currency choice of sample firms.

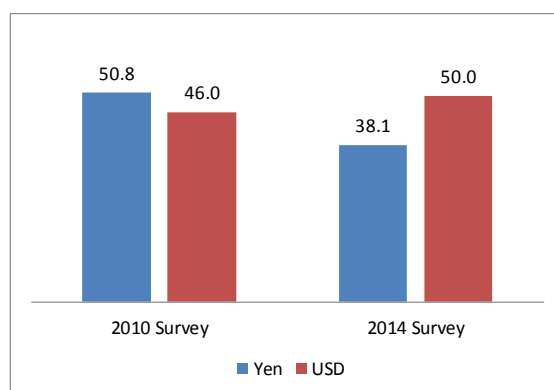
Source: Ito *et al.* (2016a).

Figure 6. Asia-based Subsidiary's Exports to and Imports from Japan

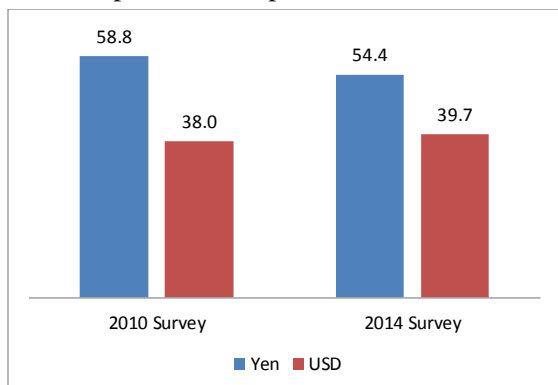
6-A1. Exports to Japanese Head Office



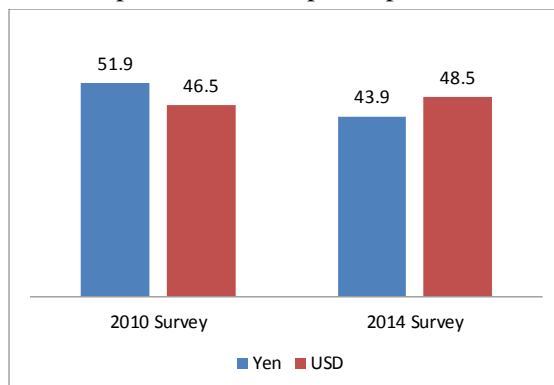
6-A2. Exports to Group Companies



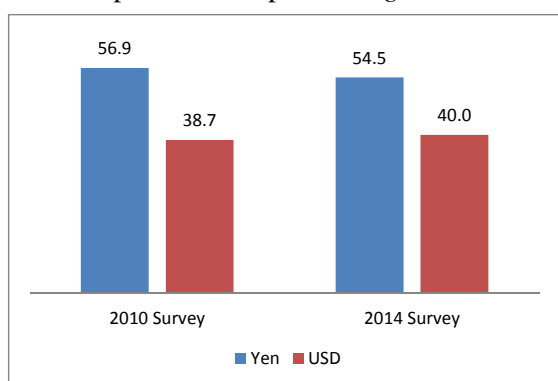
6-B1. Imports from Japanese Head Office



6-B2. Imports from Group Companies



6-B3. Imports from Japanese *Sogo Shosha*



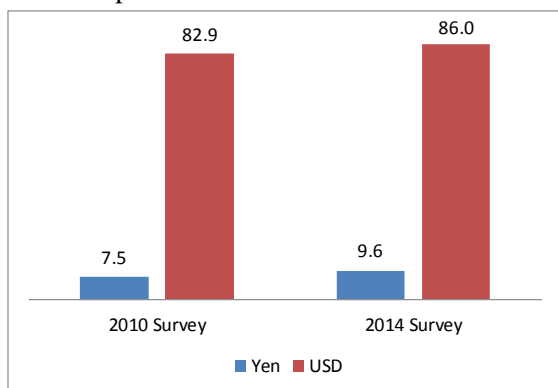
Note: Simple arithmetic average share of invoice currency choice for major export or import goods.

“Japanese *Sogo Shosha*” denotes Japanese large trading companies.

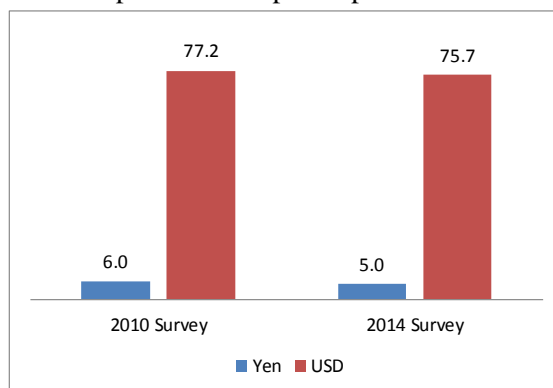
Source: Ito *et al.* (2015b).

Figure 7. Asia-based Subsidiary's Exports to and Imports from Other Countries (Excluding Japan)

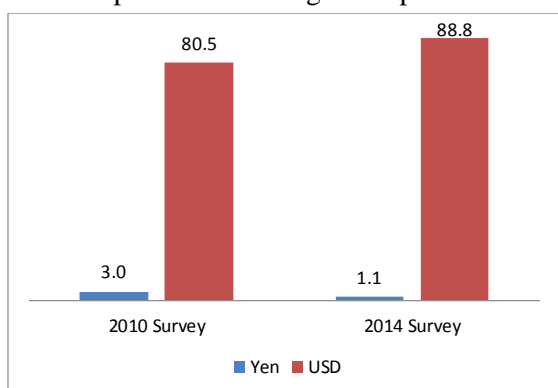
7-A1. Exports to Customers



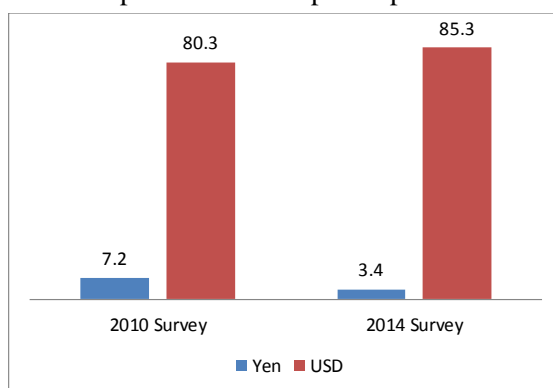
7-A2. Exports to Group Companies



7-B1. Imports from Foreign Companies



7-B2. Imports from Group Companies



Note: Simple arithmetic average share of invoice currency choice for major export or import goods.

Source: Ito *et al.* (2015b).

Table 1. Share of Invoice Currency in Japanese Export and Import Indices as of December 2015 (%)

<i>Industry :</i>	Export Price Index				<i>Industry :</i>	Import Price Index			
	JPY	USD	EUR	Others		JPY	USD	EUR	Others
					Foodstuffs & feedstuffs (75.8)	32.1	60.9	4.2	2.8
Textiles (12.5)	9.5	79.8	10.7	0.0	Textiles (53.5)	56.4	40.1	0.5	2.9
Chemicals & related products (95.4)	26.4	70.5	1.3	1.8	Chemicals & related products (83.3)	51.3	36.4	9.8	2.5
Metals & related products (118.2)	21.9	77.4	0.6	0.0	Metals & related products (117.1)	11.9	86.1	0.0	2.0
					Wood, lumber & related products (16.5)	4.1	79.7	16.1	0.0
					Petroleum, coal & natural gas (305.4)	8.7	91.3	0.0	0.0
General Machinery (192.0)	59.4	27.7	9.6	3.3	General Machinery (53.9)	35.0	59.5	2.7	2.7
Electric & electronic products (232.9)	36.0	55.6	7.8	0.5	Electric & electronic products (184.3)	33.7	64.9	0.6	0.9
Transportation equipment (240.6)	29.8	48.3	11.4	10.5	Transportation equipment (34.1)	37.1	47.4	15.5	0.0
Other Products (108.4)	34.0	60.7	3.7	1.5	Other Products (76.1)	23.3	71.7	2.0	3.0
All Industries (1,000.0)	35.9	53.3	7.1	3.6	All Industries (1,000.0)	25.0	71.3	2.4	1.3

Note: Monthly data (as of December 2015). The share (percentage) of invoice (contract) currency is presented. Figures in parentheses under the name of each industry are weights for all industries (=1,000.0). “General Machinery” denotes “General purpose, production & business oriented machinery”. “Other Products” denotes “Other primary products & manufactured goods”.

Source: Bank of Japan, Export and Import Price Indices (2010 base).

Table 2. Share of Invoice Currency in Japanese Export and Import Indices as of December 1999 (%)

Industry :	Export Price Index					Industry :	Import Price Index				
	JPY	USD	EUR	D.Mark	Others		JPY	USD	EUR	D.Mark	Others
						Foodstuffs & feed stuffs (119.4)	20.4	72.4	0.0	0.3	6.9
Textiles (21.3)	9.1	88.2	0.0	2.4	0.4	Textiles (87.5)	22.3	70.6	0.0	0.9	6.1
Chemicals & related products (76.8)	9.2	90.2	0.0	0.3	0.2	Chemicals & related products (75.3)	35.2	63.8	0.0	0.0	0.8
Metals & related products (73.0)	14.8	82.8	0.0	0.0	2.3	Metals & related products (112.6)	14.7	83.6	0.0	0.0	1.6
						Wood, lumber & related products (51.7)	0.0	100.0	0.0	0.0	0.0
						Petroleum, coal & natural gas (178.2)	0.0	100.0	0.0	0.0	0.0
General machinery & equipment (212.2)	64.1	26.8	4.9	2.1	2.0	Machinery & equipment (282.6)	24.9	65.4	2.7	2.1	5.0
Electrical machinery & equipment (354.8)	19.7	74.8	3.4	0.5	1.6						
Transportation equipment (178.0)	12.8	52.1	18.5	11.3	5.2						
Precision instruments (26.9)	34.6	56.4	8.7	0.0	0.0						
Other manufacturing industry products (57.0)	16.2	78.2	0.0	4.3	1.2	Other primary products & manufactured goods (92.7)	13.8	68.2	0.0	5.2	12.8
All Industries (1,000.0)	26.7	62.4	5.8	3.0	2.1	All Industries (1,000.0)	17.0	76.9	0.8	1.2	4.1

Note: Monthly data (as of December 1999). The share (percentage) of invoice (contract) currency is presented. Figures in parentheses under the name of each industry are weights for all industries (=1,000.0).

Source: Bank of Japan, Export and Import Price Indices (1995 base).