Invoice Currency Choice and its Determinants in Japanese
Trade: New Evidence from Japanese Customs Data

*Faculty of Economics, Gakushuin University, Japan / Policy Research
Institute, Ministry of Finance, Japan*
Junko SHIMIZU
*Department of Economics, Yokohama National University, Japan / Policy
Research Institute, Ministry of Finance, Japan*
Kiyotaka SATO
*School of International and Public Affairs, Columbia University, USA /
NBER / National Graduate Institute for Policy Studies, Japan*
Takatoshi ITO
*Faculty of Economics, Shiga University, Japan / Policy Research
Institute, Ministry of Finance, Japan*
Yushi YOSHIDA
*Faculty of Economics, Chuo University, Japan / Policy Research
Institute, Ministry of Finance, Japan*
Taiyo YOSHIMI
Policy Research Institute, Ministry of Finance, Japan
Uraku YOSHIMOTO

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Invoice Currency Choice and its Determinants in Japanese Trade: New Evidence from Japanese Customs Data[*1]

Junko SHIMIZU[*2,7]

Kiyotaka SATO[*3,7]

Takatoshi ITO[*4]

Yushi YOSHIDA[*5,7]

Taiyo YOSHIMI[*6,7]

Uraku YOSHIMOTO[*7]

-- Abstract --

In this study, we use microdata from Japanese customs declarations and calculate semiannual invoice currency shares by country, both on a value and transaction basis. From country-level data, we can confirm the following: First, the impression that Japan's trade is biased toward the U.S. dollar (USD) is mainly due to choices in the U.S., China, and resource-rich countries with large trade volumes. Second, the yen invoicing is selected on a value basis and an even larger transaction number basis, and the local currency invoicing is also used on a bilateral country basis. Third, the choice of invoice currency has changed in recent years. From 2014 to 2020, the USD lost the most shares, falling in 23 of the 34 countries. By conducting an empirical analysis exploring the determinants of invoice currency, our main findings confirm that the intermediate goods trade share has the effect of reducing Yen and increasing USD invoicing in export, while the higher the inflation gap, the more likely one is to use USD invoicing, which suggests that Japanese firms will be further exposed to foreign exchange risk in the future.

Keywords: Invoice currency share, Customs data, Trading partner

JEL Classification: F23, F31, F33

1. Introduction

The Japanese Ministry of Finance has been publishing the shares of invoice currencies by trading partner region on a semi-annual basis. This provided valuable data for understanding developments in the currencies that Japanese firms choose for their imports and exports. However, information aggregated at the regional level was strongly influenced by the choice of countries accounting for large trade volumes and does not provide information on the extent to which the yen or trading partner currencies are used in trade with individual trading partner countries. In recent years, there has been a notable increase in the use of local currencies in Asian countries. Still, the data aggregated for Asia did not make it possible to understand the situation accurately.

Regarding the use of invoice currencies, the pattern observed for Japan is somewhat of a puzzle: although Japan is a developed country, Japanese firms are more likely to invoice their exports and imports in a third-country currency, the U.S. dollar (USD), than the yen – even in trade with emerging Asian economies. This pattern differs from that observed for major advanced countries and conflicts with stylized facts regarding the use of invoice currencies (outlined below). Various studies, such as Ito et al. (2010, 2013, 2016, 2018, 2021) and Shimizu et al. (2021), have investigated this puzzle through interviews with firms and questionnaire surveys. The studies suggest that firms' foreign exchange risk management is the main reason. As Japanese firms have expanded their supply chains across Asia through overseas subsidiaries, they have adopted the USD to conduct intra-firm trade, with the corporate finance division at the headquarters in Japan collectively managing foreign exchange risk. However, the sample sizes and response rates of such surveys are limited. Against this background, calculating and analyzing the shares of invoice currencies by trading partner country based on Japanese customs data can help to address a range of crucial issues, such as the actual use of the yen in trade invoicing and what factors are contributing to the use of the yen or other currencies in trade invoicing.

To address these issues, in the current study, we calculate country-level invoice currency shares, both on a value basis and on a transaction basis, using Japanese customs data, and examine developments in invoice currency shares of the yen, the USD, and partner country currencies at the country level. This provides valuable information for considering future corporate currency risk management and the government's international economic policies. Notably, such information on invoice currency shares by country is likely to provide a valuable reference for firms newly entering trade transactions. Furthermore, finding the determinants of invoice currency choice will allow us to discuss how the recent supply chain restructuring will affect the invoice currency choice.

The remainder of this study is organized as follows. Section 2 presents some theoretical considerations and stylized facts on the choice of invoice currency and provides characteristics of Japanese firms' choice of invoice currency from trade statistics published by the Ministry of Finance. Section 3 explains the invoice currency share data calculation by trading partner countries conducted for this study and the countries considered. Section 4 provides an overview of the results of currency share by country. In Section 5, using the currency share by country as a dependent variable, we conduct a panel analysis to investigate what country factors significantly affect currency invoicing. Section 6 summarizes the empirical results and draws policy implications.

2. Characteristics of Japanese Firm's Choice of Invoice Currency

The yen's nominal exchange rate against the USD followed a long-term appreciation trend from the end of the Bretton Woods system in 1971 until 2012, albeit with some short-term fluctuations. Japanese firms have been confronting the foreign exchange risk of substantial yen fluctuations.[1] The impact of exchange rate fluctuations

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[1] That said, the peak of the real effective exchange rate was in 1995.

on import and export prices, especially in the short term, varies greatly depending on which currency is used as the invoice currency. If Japanese firms choose to export in yen, they are unaffected by exchange rate fluctuations because their counterparts bear the exchange rate risk. This means that exporters pass entirely on exchange rate fluctuations to their export partners. Conversely, when a Japanese firm exports in USD (or in the partner country's currency), the selling price in USD (or the partner country's currency) in the destination country will be stable; however, the Japanese exporter will bear any gains or losses from exchange rate fluctuations. This latter pricing behavior is called zero exchange rate pass-through (ERPT) or complete pricing-to-market (PTM), where export prices are stable in the destination country's currency.

Let us consider a concrete example. For exports denominated in USD, the yen amount received is the USD export price multiplied by the yen-dollar exchange rate. Therefore, when the yen weakens against the USD, the amount received in yen increases, which has a positive impact on firms' profits and is likely to raise their share prices. On the other hand, for imports denominated in USD, the amount paid in yen equals the USD import price multiplied by the yen-USD exchange rate. Hence, a yen depreciation increases import payments. If this increase in import payments is passed on to consumer prices, domestic prices will rise, resulting in cost-push inflation. Thus, the choice of invoice currency and the ERPT/PTM are interrelated and can significantly impact firms' profits and domestic prices.

Many studies have examined the choice of invoice currency. Among the first was Grassman (1973, 1976), who highlighted that trade in industrial products among developed countries tended to be invoiced in the exporting country's currency (referred to as Grassman's Law). This gives rise to the following stylized fact:

Stylized Fact 1: Trade in industrial products between developed countries is invoiced in the exporting country's currency.

Moreover, it has been pointed out that trade between developed and developing countries tends to be invoiced in the currency of the developed country (Grassman, 1973; Page, 1977, 1981). This tendency in the invoice currency choice is easy to understand if one considers that when developed countries export manufacturing products to developing countries, they are better positioned to negotiate export contracts than developing countries. Therefore, the next stylized fact is as follows:

Stylized Fact 2: When manufacturing products are exported from developed countries to developing countries, they are traded in the developed country's currency.

Furthermore, McKinnon (1979) presents an important hypothesis regarding industry- and product-specific differences in invoice currency choice. This can be summarized as the following stylized fact:

Stylized Fact 3: Exports of differentiated goods are traded in the exporting country's currency. Homogeneous goods such as crude oil are traded in the international key currency such as the USD.

The puzzle mentioned earlier is that Japan's patterns regarding invoice currency use do not fit these stylized facts. To illustrate this, Table 1 shows the shares of total exports and imports of the six major countries in 1980, 2000, and 2019, invoiced in their currencies and USD. The table shows that for Japan, the share invoiced in its currency is relatively low for both exports and imports. In contrast, the share invoiced in USD is still very high

compared to other countries, even though it has declined recently. In 2019, for example, 49.7% of Japan's exports were invoiced in USD, about 12 percentage points higher than the share invoiced in yen. The pattern is particularly pronounced for Japanese imports, with only 25.5% of Japan's imports in 2019 invoiced in yen, while 67.4% were invoiced in USD. Looking at the corresponding shares for other major developed economies shows that for Germany, the share of its currency has been high since the days of the German mark, exceeding 75% for both imports and exports. France and Italy, which had a low currency share before the introduction of the euro, have benefited from the single currency, the euro, and now have their currency shares of more than 70%. As the key currency nation for the U.S., the share of imports and exports invoiced in its currency, the USD, is as high as 95%. Unlike their counterparts in the U.S., who do not have to worry about exchange rate risk, at least in the short term, Japanese firms, to a large extent, do not conduct trade in their currency. Still, Japanese firms use a third-country currency (the USD) or the partner country's currency. Thus, they often suffer large exchange rate fluctuations.

Table 1: Share of Invoice Currencies for Six Major Economies (%)

	Export					
	Share of Own Currency			Share of U.S. dollar		
	1980	2000	2019	1980	2000	2019
U.S.	97.0	96.1†	95.7‖	97.0	96.1†	95.7‖
Japan	28.9	36.1	37.2	66.3	52.4	49.7
Germany	82.3	72.0‡	75.9	7.2	17.1‡	17.7
U.K.	76.0	50.0	37.7	17.0	29.0	32.7
France	62.5	75.6	72.3	13.2	21.0	22.0
Italy	36.0	75.2‡	82.3‖	30.0	18.1‡	14.1‖

	Import					
	Share of Own Currency			Share of U.S. dollar		
	1980	2000	2019	1980	2000	2019
U.S.	85.0	93.2†	95.1‖	85.0	93.2†	95.1‖
Japan	2.4	23.5	25.5	93.1	70.7	67.4
Germany	43.0	72.7‡	77.4	32.3	18.7‡	20.2
U.K.	38.0	47.0	24.8	29.0	34.0	43.6
France	34.1	74.9	74.2	33.1	21.0	23.4
Italy	18.0	71.0‡	71.2‖	45.0	24.9‡	25.9‖

Note: ‡Data in 2001, ‡Data in 2002, †Data in 2004, ‖ Data in 2018

Source: Ito et al. (2018), Chapter 2, excerpted from Table 2-1.

Next, look at changes in invoice currency shares by a trading partner based on Japanese invoice currency share data by region published by the Ministry of Finance. First, the USD is the largest share of Japan's exports to the U.S. For example, in the second half of 2022, 86.7% of Japan's exports to the U.S. were invoiced in USD, while the share invoiced in yen was only 13.2% (Figure 1-1). This situation has not changed since 1987, the first year these statistics were available. This high USD invoice share in Japan's exports to the U.S. conflicts with Stylized Fact 1. Moreover, Figures 1-2 show that more than 70% of Japan's imports from the U.S. are also invoiced in USD. Although the yen invoice share today is moderately higher than in the 1990s, it remained at only 22.3% in the second half of 2022.

Figure 1-1: Share of Currency in Exports from Japan
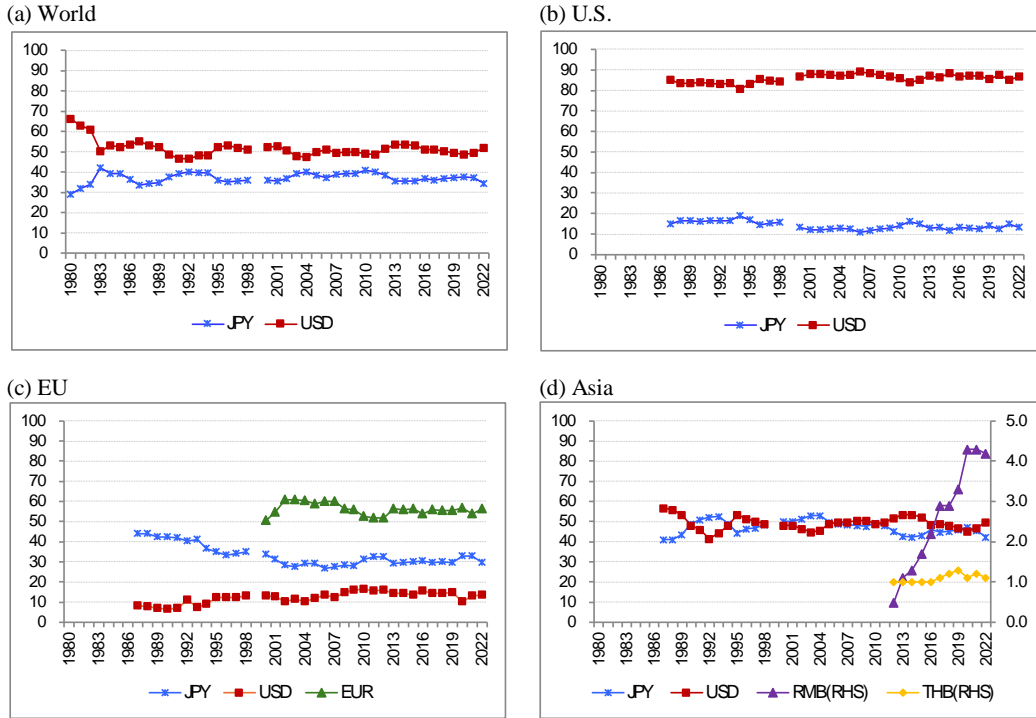
(a) World

(b) U.S.

(c) EU

(d) Asia

Source: Ministry of Finance, Japan (https://www.customs.go.jp/toukei/shinbun/tuukahappyou.html)

Note: Data are published in semiannual figures, but data for the second half of each year are used in this table.

Figure 1-2: Share of Currency in Imports to Japan
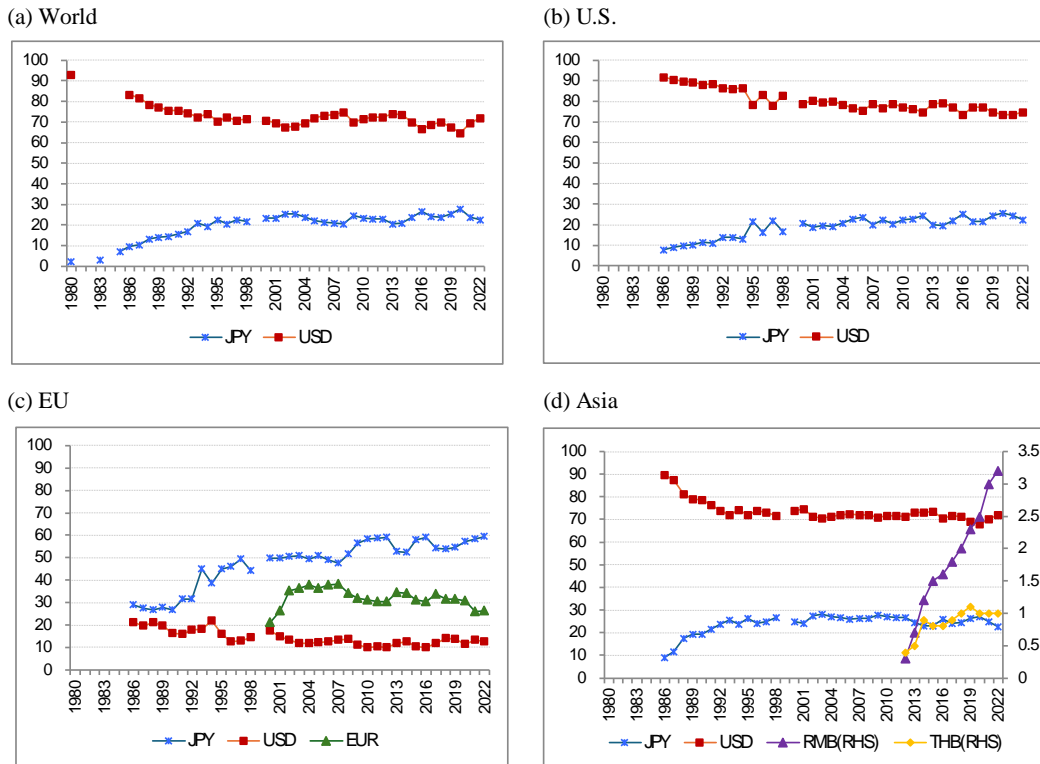
(a) World

(b) U.S.

(c) EU

(d) Asia

Source: Ministry of Finance, Japan (https://www.customs.go.jp/toukei/shinbun/tuukahappyou.html)

Note: Data are published in semiannual figures, but data for the second half of each year are used in this table.

Shimizu et al. (2021), Ito et al. (2018), and Ito et al. (2021) suggest that the following two factors explain why Japanese firms' exports are mainly invoiced in dollars. The first, as mentioned, is linked to managing foreign exchange risk: as supply chains through overseas subsidiaries have expanded, Japanese firms have sought to unify intra-firm trade in one currency, the USD, with the corporate finance division at the headquarters in Japan managing foreign exchange risk. Second, Japanese firms face fierce price competition in overseas markets. Competition is not limited to Western firms. Asian firms from South Korea and Taiwan are also competitors, and Japanese firms cannot afford to change their prices every time the yen-dollar exchange rate changes. Therefore, Japanese firms use the PTM strategy to stabilize local selling prices and secure market share. This strategy is observed mainly in Japan's trade with Europe: more than 50% of Japanese exports to Europe are invoiced in the destination country's currency, i.e., the euro. At the same time, the share of European exports to Japan (i.e., Japanese imports) invoiced in the yen has been on the rise since the 2000s and, in the first half of 2022, exceeded 60% for the first time with a value of 60.9%.

In Japan's trade with Asia, the USD and the yen shares in Japanese exports are almost on par. This pattern has remained unchanged since 1987, the first year these statistics were available. While most of Japan's exports to Asia are invoiced in two developed-country currencies, the yen and the USD, the fact that the share of yen invoicing in Japan's exports is below 50% and is on par with the share of USD invoicing conflicts with Stylized Fact 2 in that much of the trade uses a third-country currency, the USD, rather than the yen or local Asian currencies. This pattern is even more pronounced in Japan's imports from Asia. Although the USD share has gradually declined since the 1990s and fell below the 70% level in 2019, the share of yen invoicing has not increased. Instead, the decline in the USD share has been mirrored by a rise in the share of Asian currencies.

Data on trade with Asia invoiced in Asian local currencies, such as the Chinese yuan and the Thai baht, is available from 2012 onward and shows that the share of Japanese exports invoiced in yuan has risen from 0.5% in late 2012 to 4.2% in the second half of 2022. On the other hand, the share of exports invoiced in Thai baht has remained unchanged at around 1%. While looking at these shares alone might lead one to conclude that Japan's trade with other Asian countries is rarely invoiced in local currencies, this would be premature since these shares are calculated as the local currency shares in Japan's total trade with Asia, not in the bilateral trade between Japan and individual countries. Therefore, to understand the extent to which the yen and local currencies are used in bilateral trade, it is necessary to look not at regional data but at country-level bilateral trade. Such an understanding is essential both for firms' currency risk management and the government's international economic policies, and providing the necessary information is one of the significant contributions of this study.

3. Analysis Using Japanese Customs Data

This study forms part of the "Joint Research Using Export/Import Declaration Data," for which the Ministry of Finance (MOF) publicly solicited applications in FY2021 based on the "Basic Policy on Economic and Fiscal Management and Reform 2021" (Cabinet decision on June 18, 2021), which calls for making the best use of data compiled by the government. For the analysis, we sort the microdata of import/export (2014–2020) held by Japan Customs by invoice currency code and calculate the invoice currency shares. The procedures for exports and imports, respectively, are as follows:

(a) For exports, the total number of transactions[2] and the total declared value are calculated using the invoice currency code for each destination country code.

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[2] The number of declaration columns is used. The same applies for imports.

(b) For imports, the total number of transactions and the total value on a customs valuation basis are calculated using the invoice currency code used for each country-of-origin code.

Based on the above data, we calculate the annual invoice currency shares of major currencies (USD, yen, and euro) and the destination/origin country currency by country, both on a value basis and in terms of the number of transactions and examine developments in the invoice currency shares over the period from 2014 to 2020.[3]

As sample countries, we used the top 34 countries to rank Japan's export and import partners in 2020. A list of these countries and their shares in Japan's exports and imports are shown in Tables 2. China is the top export destination, accounting for 22.07% of Japan's exports. While the U.S. (18.44%) is second, ranks three to seven are taken up by other Asian countries, led by South Korea (6.97%) and Taiwan (6.93%), followed by Hong Kong (4.99%), Thailand (3.98%), and Singapore (2.76%) – the top 34 countries in the table account for just under 95% of Japan's total exports.

Among import partners, China ranks first with 25.77%, far ahead of the U.S. (10.95%), followed by Australia (5.63%), and then several Asian countries, led by Taiwan (4.21%), South Korea (4.18%), Thailand (3.74%), and Vietnam (3.46%). Oil-producing countries such as Saudi Arabia (2.89%) and the United Arab Emirates (2.56%) are ranked in the top 10. The top 34 countries account for over 93% of Japan's total imports.

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[3] The reason for aggregating the invoice currency shares on an annual basis is that shares calculated on a more frequent basis – such as a monthly or semiannual basis – are unduly affected by larger-value import and export declarations.

Table 2: Ranking of Japan's Export and Import Partner Countries in 2020

<Export>

Ranking	Country	Value (1,000USD)	Share (%)
1	China	141,250,228	22.07%
2	U.S.	117,998,858	18.44%
3	South Korea	44,587,147	6.97%
4	Taiwan	44,326,213	6.93%
5	Hong Kong	31,947,803	4.99%
6	Thailand	25,469,579	3.98%
7	Singapore	17,640,049	2.76%
8	Germany	17,538,203	2.74%
9	Vietnam	17,088,307	2.67%
10	Malaysia	12,569,861	1.96%
11	Australia	12,117,894	1.89%
12	Netherlands	10,890,745	1.70%
13	U.K.	10,698,313	1.67%
14	Indonesia	9,153,703	1.43%
15	India	9,091,201	1.42%
16	Philippines	8,787,896	1.37%
17	Mexico	8,375,102	1.31%
18	Canada	7,228,848	1.13%
19	Belgium	6,540,010	1.02%
20	Russia	5,870,453	0.92%
21	France	5,635,608	0.88%
22	United Arab Emirates	5,544,442	0.87%
23	Switzerland	4,819,440	0.75%
24	Panama	4,576,599	0.72%
25	Saudi Arabia	4,228,529	0.66%
26	Italy	3,770,360	0.59%
27	Brazil	2,948,566	0.46%
28	Poland	2,853,711	0.45%
29	Turkey	2,663,466	0.42%
30	Spain	2,156,720	0.34%
31	Liberia	2,152,908	0.34%
32	New Zealand	1,841,372	0.29%
33	South Africa	1,667,207	0.26%
34	Hungary	1,582,988	0.25%
	Others	34,337,244	5.37%
	Total	639,949,573	100.00%

<Import>

Ranking	Country	Value (1,000USD)	Share (%)
1	China	163,842,431	25.77%
2	U.S.	69,625,747	10.95%
3	Australia	35,784,604	5.63%
4	Taiwan	26,762,045	4.21%
5	South Korea	26,557,825	4.18%
6	Thailand	23,753,550	3.74%
7	Vietnam	22,025,435	3.46%
8	Germany	21,273,953	3.35%
9	Saudi Arabia	18,384,592	2.89%
10	United Arab Emirates	16,305,587	2.56%
11	Malaysia	15,898,744	2.50%
12	Indonesia	15,477,546	2.43%
13	Canada	10,931,577	1.72%
14	Russia	10,699,448	1.68%
15	Italy	10,471,183	1.65%
16	Philippines	9,362,936	1.47%
17	France	9,238,268	1.45%
18	Qatar	9,139,655	1.44%
19	Singapore	8,550,761	1.35%
20	Switzerland	7,547,358	1.19%
21	Brazil	7,489,412	1.18%
22	Chile	6,982,832	1.10%
23	Ireland	6,568,914	1.03%
24	U.K.	6,403,501	1.01%
25	South Africa	5,761,992	0.91%
26	Mexico	5,433,080	0.85%
27	India	4,713,717	0.74%
28	Kuwait	4,535,828	0.71%
29	Belgium	3,254,686	0.51%
30	Spain	3,160,375	0.50%
31	Netherlands	3,091,714	0.49%
32	Sweden	2,823,070	0.44%
33	New Zealand	2,495,429	0.39%
34	Peru	2,329,383	0.37%
	Others	39,029,874	6.14%
	Total	635,707,052	100.00%

Source: Japan's International Trade in Goods, Japan External Trade Organization (JETRO).

4. Summary of Findings

We start by presenting a separate overview of the results for exports and imports. Table 3 shows the invoice currency shares (of the yen, USD, euro, and partner country currency) in Japanese exports in 2020 by trading partner country both on a value basis and in terms of the number of transactions. Moreover, changes in these shares from 2014 are shown in parentheses. Looking at the invoice currency shares (in value terms) in Japan's exports in 2020 shows that for ten of the top 34 export destinations (excluding the U.S.), the USD makes up the largest share; for nine, the yen makes up the largest share; for 11, the destination country currency makes up the largest share, and for four, another currency (the euro) makes up the largest share.

Looking at changes from 2014, the currency that saw the broadest decline in its invoicing share in Japanese exports is the USD, with 22 out of the 34 countries registering a decrease in the USD share. On the other hand, the invoice currency share of the yen increased for 20 countries, while the share of destination country currency increased in the case of 23 countries. The table thus shows that the U.S. invoice currency share has been decreasing while the shares of the yen and destination country currencies have been increasing. A closer look at Asian countries reveals that the USD share has declined in Japanese exports to eight of the 11 countries. Taiwan, Vietnam, and India are the exceptions, while the share of destination country currencies has been rising. Among emerging market currencies, the largest increases in the destination country currency share were seen in exports to China (+6.8 percentage points), Brazil (+5.7 percentage points), and India (+5.3 percentage points).

Next, comparing the shares based on value and the number of transactions shows several differences. Regarding the number of transactions, the yen accounts for the largest invoice currency share in exports to 22 countries. In comparison, the destination country's currency accounts for the largest share of exports to another six countries. Only in exports to four countries (excluding the U.S.) does the USD account for the largest invoice currency share. Specifically, in exports to Asia, the yen accounts for most transactions with all countries, suggesting that small-value transactions are invoiced in yen and high-value transactions are invoiced in dollars. Examining Japanese firms' choice of invoice currency through questionnaire surveys, Ito et al. (2018, 2021) and Shimizu et al. (2021) showed that the larger a firm, the more likely it was to use the USD for invoicing, and the fact that this pattern is confirmed in the customs declaration data is a major finding. Compared to the shares in 2014, just like on a value basis, when focusing on the number of transactions, there are 24 countries for which the share of Japanese exports invoiced in USD has declined. The share invoiced in the destination country currency has increased in most cases. Among emerging market currencies, the largest increases in the share invoiced in the destination country currency were seen in exports to Brazil (+10.0 percentage points), China (+9.3 percentage points), and Russia (+9.1 percentage points).

Table 3: Invoice Currency Shares by Partner Country (Exports, 2020)

		Currency Share in Value (2020)				Currency Share in Number of Transaction (2020)			
		U.S.dollar	Japanese yen	Euro	Partner Country Currency	U.S.dollar	Japanese yen	Euro	Partner Country Currency
Asia	China	47.5% (▲ 9.3%)	41.8% (+2.4%)	0.3% (+0.1%)	10.4% (+6.8%)	36.1% (▲ 9.9%)	49.4% (+0.7%)	0.3% (+0.1%)	14.1% (+9.3%)
	Hong Kong	46.2% (▲ 9.0%)	51.5% (+9.0%)	0.2% (▲ 0.0%)	1.8% (▲ 0.2%)	35.4% (▲ 7.5%)	61.9% (+7.0%)	0.3% (▲ 0.0%)	1.5% (▲ 0.1%)
	South Korea	34.3% (▲ 6.3%)	59.4% (+3.4%)	0.2% (+0.0%)	6.0% (+3.1%)	23.7% (▲ 3.8%)	69.1% (+0.2%)	0.3% (+0.1%)	6.8% (+3.4%)
	Taiwan	44.3% (+4.0%)	52.1% (▲ 5.7%)	0.1% (+0.0%)	3.3% (+1.6%)	29.7% (▲ 1.9%)	64.6% (▲ 0.2%)	0.1% (+0.0%)	5.3% (+1.9%)
	Thailand	42.5% (▲ 2.6%)	41.6% (▲ 2.1%)	0.3% (+0.1%)	15.5% (+4.5%)	29.7% (▲ 3.3%)	52.7% (▲ 1.6%)	0.3% (+0.2%)	17.1% (+4.6%)
	Malaysia	47.4% (▲ 4.1%)	50.4% (+3.9%)	0.2% (+0.0%)	1.9% (+0.1%)	33.2% (▲ 1.6%)	62.3% (+0.4%)	0.1% (▲ 0.0%)	3.9% (+1.2%)
	Indonesia	54.2% (▲ 3.5%)	39.0% (+1.0%)	0.1% (+0.1%)	6.6% (+2.4%)	43.0% (▲ 5.3%)	48.8% (+0.5%)	0.1% (▲ 0.0%)	7.9% (+4.6%)
	Singapore	59.2% (▲ 6.3%)	36.7% (+5.7%)	0.5% (+0.1%)	3.4% (+0.3%)	38.2% (▲ 3.1%)	55.7% (+1.8%)	0.4% (▲ 0.0%)	5.6% (+1.3%)
	Philippines	55.3% (▲ 1.3%)	44.0% (+1.1%)	0.1% (+0.0%)	0.6% (+0.1%)	40.2% (▲ 3.4%)	58.7% (+3.2%)	0.1% (+0.0%)	0.9% (+0.1%)
	Vietnam	65.4% (+4.2%)	34.2% (▲ 4.1%)	0.1% (+0.0%)	0.1% (+0.1%)	45.0% (▲ 0.9%)	54.3% (+0.6%)	0.1% (▲ 0.0%)	0.3% (+0.2%)
	India	50.6% (+0.6%)	38.7% (▲ 5.4%)	1.0% (▲ 0.4%)	9.6% (+5.3%)	31.6% (▲ 3.5%)	55.5% (▲ 1.4%)	0.4% (▲ 0.0%)	12.4% (+4.9%)
Oceania	Australia	15.4% (▲ 10.1%)	22.5% (+2.1%)	0.3% (+0.1%)	61.7% (+7.9%)	16.4% (▲ 0.3%)	55.4% (+6.5%)	0.4% (+0.1%)	27.6% (▲ 6.2%)
	New Zealand	13.7% (▲ 4.2%)	46.5% (▲ 5.8%)	0.1% (▲ 0.1%)	36.8% (+14.1%)	5.3% (▲ 2.7%)	71.4% (▲ 15.0%)	0.1% (▲ 0.1%)	21.3% (+17.5%)
Europe	U.K.	27.0% (+6.0%)	19.9% (+1.1%)	16.1% (▲ 8.6%)	37.0% (+1.4%)	11.7% (+1.8%)	40.6% (+3.6%)	29.5% (▲ 3.4%)	18.2% (▲ 2.1%)
	Switzerland	48.1% (+8.7%)	21.1% (▲ 11.7%)	4.4% (▲ 2.2%)	26.4% (+5.2%)	14.7% (+6.0%)	59.6% (▲ 1.5%)	16.7% (+1.5%)	9.0% (▲ 3.0%)
	Germany	12.0% (▲ 1.3%)	33.7% (▲ 1.1%)	53.7% (+1.9%)	*	10.6% (▲ 0.6%)	43.1% (+1.0%)	46.3% (▲ 0.2%)	*
	Netherlands	10.6% (▲ 3.3%)	23.9% (▲ 0.5%)	65.3% (+3.7%)	*	7.9% (▲ 1.1%)	28.4% (+0.3%)	63.1% (+0.4%)	*
	France	7.3% (+1.5%)	38.7% (+17.5%)	53.9% (▲ 19.1%)	*	9.2% (+1.1%)	40.3% (+2.2%)	50.5% (▲ 3.3%)	*
	Italy	11.6% (+3.5%)	34.1% (▲ 7.7%)	53.8% (+4.1%)	*	8.3% (+0.5%)	45.8% (+1.2%)	45.7% (▲ 1.7%)	*
	Spain	10.8% (+4.2%)	21.2% (+2.0%)	67.9% (▲ 6.2%)	*	6.8% (+1.9%)	44.1% (+11.1%)	49.0% (▲ 13.1%)	*
	Belgium	7.5% (▲ 3.8%)	36.4% (+7.8%)	56.0% (▲ 3.9%)	*	8.6% (+2.0%)	28.2% (▲ 1.9%)	63.1% (+0.1%)	*
	Russia	15.1% (▲ 11.5%)	32.1% (+7.9%)	15.7% (+0.4%)	37.2% (+3.3%)	12.9% (▲ 12.4%)	61.8% (+9.5%)	7.6% (▲ 6.2%)	17.8% (+9.1%)
	Poland	24.8% (+14.4%)	22.6% (▲ 6.3%)	51.1% (▲ 5.1%)	1.5% (▲ 3.0%)	9.2% (+0.8%)	38.8% (+1.6%)	51.5% (▲ 2.2%)	0.5% (▲ 0.2%)
	Hungary	6.7% (▲ 8.6%)	18.7% (+5.2%)	74.6% (+3.5%)	0.1% (—)	7.6% (▲ 0.2%)	23.9% (+3.5%)	68.3% (▲ 3.2%)	0.0% (—)
	Turkey	18.0% (▲ 6.8%)	25.7% (▲ 15.9%)	54.5% (+23.2%)	1.8% (+0.3%)	16.3% (▲ 1.3%)	45.1% (▲ 9.1%)	37.1% (+9.4%)	1.5% (+0.9%)
North & Latin America	U.S.	86.7% (▲ 0.3%)	13.0% (+0.2%)	0.2% (+0.1%)	*	76.1% (▲ 3.1%)	23.7% (+3.0%)	0.2% (+0.0%)	*
	Canada	43.9% (▲ 8.8%)	9.2% (▲ 1.2%)	0.1% (+0.0%)	46.8% (+10.1%)	51.8% (▲ 4.6%)	27.3% (+4.6%)	0.3% (+0.2%)	20.6% (▲ 0.1%)
	Mexico	65.9% (▲ 10.8%)	22.0% (+1.4%)	0.4% (+0.3%)	11.7% (+9.1%)	69.5% (▲ 11.4%)	23.6% (+6.6%)	0.2% (+0.1%)	6.8% (+4.7%)
	Brazil	50.5% (▲ 10.6%)	39.7% (+4.9%)	0.9% (+0.2%)	8.9% (+5.7%)	46.2% (▲ 13.0%)	39.2% (+3.0%)	0.7% (+0.2%)	13.9% (+10.0%)
	Panama	33.4% (+5.0%)	66.6% (▲ 5.0%)	0.0% (—)	0.0% (—)	18.4% (▲ 27.1%)	81.0% (+27.0%)	0.4% (+0.1%)	0.0% (—)
Others	United Arab Emirates	35.2% (+4.6%)	60.0% (▲ 6.1%)	3.4% (+0.4%)	1.4% (+1.0%)	25.5% (+0.1%)	72.8% (▲ 1.1%)	1.1% (+0.5%)	0.6% (+0.5%)
	Saudi Arabia	35.8% (▲ 1.7%)	62.5% (+1.1%)	1.3% (+0.6%)	0.2% (▲ 0.0%)	63.8% (+0.4%)	33.7% (▲ 1.3%)	2.0% (+0.9%)	0.3% (▲ 0.1%)
	South Africa	14.1% (+1.9%)	38.2% (+6.8%)	38.4% (▲ 4.1%)	9.2% (▲ 4.8%)	16.8% (+5.2%)	47.8% (▲ 1.8%)	24.3% (+1.5%)	10.9% (▲ 5.0%)
	Liberia	41.0% (▲ 15.2%)	58.9% (+15.2%)	0.1% (—)	0.0% (—)	1.0% (▲ 4.7%)	96.0% (+4.7%)	2.4% (▲ 0.4%)	0.0% (—)

Note: Figures in parentheses show the change in invoice currency shares from 2014 to 2020. The asterisk (*) denotes cases where the partner country currency is the USD or the euro. The minus sign (-) denotes cases where it is difficult to state the figures as a percentage due to the absence of actual results or because the value is minimal.

Next, Table 4 shows the invoice currency shares (for the yen, USD, euro, and partner country currency) for imports in 2020 by country of origin. Among the top 34 countries of origin in 2020, the USD accounts for the largest invoice currency share (in value terms) for 17 countries (excluding the U.S.), the yen accounts for the largest share for 15 countries, and the partner country's currency accounts for the largest share for two countries.

The USD invoice share is highest for imports from the oil-producing countries of the Middle East: for all four countries in the list, it is over 95%. Other countries for which the USD invoice share is high are South Africa (77.1%), Brazil (76.3%), and Russia (74.3%), imports from which are mainly resource related. The yen invoice share is highest for imports from Ireland (77.4%), Sweden (74.8%), and Chile (70.4%), and overall, the yen invoice share tends to be high for imports from Europe. Apart from the U.S. (71.8%), the country with the highest country of their currency share is the Netherlands, with 43.8%.

Comparing the shares in 2020 with those in 2014 shows that the currency with the most widespread decline in use in Japanese imports is the USD, with the share falling for imports from 23 out of the 34 countries. A decline follows this in using partner country currencies, whose invoice share declined in the imports from 14 countries (excluding the U.S.). Reflecting these declines, the invoice currency share of the yen increased in imports from 24 countries, showing that, as a trend, the USD share has declined, and the yen share has increased. This is particularly the case of imports from Europe, where the invoicing share of the yen has risen for eight of the 11 countries. The most significant increases in the yen invoicing share were observed in imports from Italy (+21.0 percentage points), Singapore (+17.3 percentage points), and Switzerland (+15.7 percentage points).

As for exports, differences can be seen between the value-based and transaction-based shares. On a transaction basis, the USD accounts for the largest share of imports from 21 countries, followed by the yen and the partner country currency, which account for the largest shares of imports from six and seven countries (excluding the U.S.), respectively. This suggests that – unlike in the case of exports – when it comes to imports, small-value transactions tend to be invoiced in USD, while high-value transactions tend to be invoiced in yen. Next, the comparison with 2014 indicates that the USD invoice share declined in imports from 20 countries, which is similar to the result on a value basis, and the yen invoice share increased in the imports from most of these countries. The share of invoices in the partner country currency has not increased much, with imports from Thailand (+3.5 percentage points) and China (+3.2 percentage points) seeing the largest increases in partner currency shares among emerging market currencies.

Table 4: Invoice Currency Shares by Partner Country (Imports, 2020)

		Currency Share in Value (2020)				Currency Share in Number of Transaction (2020)			
		U.S.dollar	Japanese yen	Euro	Partner Country Currency	U.S.dollar	Japanese yen	Euro	Partner Country Currency
Asia	China	72.7% (▲1.6%)	21.4% (▲0.7%)	0.5% (▲0.5%)	5.1% (+2.9%)	72.5% (▲3.6%)	20.6% (+0.7%)	0.8% (▲0.1%)	5.5% (+3.2%)
	South Korea	37.4% (▲4.3%)	58.7% (+3.2%)	0.2% (▲0.0%)	3.5% (+1.1%)	29.9% (+1.3%)	62.5% (▲1.6%)	0.4% (+0.1%)	7.1% (+0.3%)
	Hong Kong	14.3% (▲0.5%)	84.0% (+1.4%)	0.2% (▲0.5%)	0.9% (+0.3%)	59.7% (▲3.5%)	29.3% (+3.1%)	2.1% (+0.2%)	6.3% (+0.2%)
	Taiwan	73.1% (+2.5%)	24.0% (▲2.5%)	0.2% (+0.1%)	2.6% (+0.1%)	61.9% (+2.9%)	31.3% (▲3.2%)	0.5% (+0.1%)	5.9% (+0.2%)
	Thailand	49.8% (▲2.9%)	35.9% (▲0.2%)	0.3% (+0.1%)	13.8% (+3.0%)	47.2% (+0.5%)	34.8% (▲4.0%)	0.6% (▲0.2%)	17.1% (+3.5%)
	Malaysia	65.5% (+17.0%)	32.2% (▲18.4%)	0.3% (+0.2%)	1.3% (+1.1%)	66.4% (▲2.5%)	28.2% (+0.5%)	0.9% (+0.3%)	3.3% (+1.7%)
	Indonesia	62.8% (▲11.5%)	35.5% (+10.8%)	0.1% (+0.0%)	1.2% (+0.6%)	73.3% (+1.3%)	23.2% (▲0.1%)	0.7% (▲0.2%)	2.0% (▲0.3%)
	Singapore	40.0% (▲16.0%)	56.5% (+17.3%)	0.2% (▲0.1%)	3.2% (▲1.1%)	61.8% (▲4.2%)	30.5% (+5.2%)	1.0% (▲0.0%)	6.2% (▲0.9%)
	Philippines	40.8% (▲2.9%)	58.4% (+3.0%)	0.5% (+0.2%)	0.4% (▲0.3%)	45.3% (▲1.5%)	53.6% (+1.6%)	0.5% (+0.2%)	0.6% (▲0.1%)
	Vietnam	66.6% (▲13.6%)	33.1% (+13.6%)	0.2% (▲0.1%)	0.0% (▲0.0%)	76.2% (▲3.5%)	22.8% (+3.8%)	0.7% (▲0.3%)	0.1% (▲0.0%)
	India	78.5% (▲5.2%)	18.8% (+4.4%)	1.3% (+0.1%)	0.9% (+0.5%)	72.5% (+0.7%)	18.8% (+0.7%)	5.6% (▲1.3%)	1.8% (+0.5%)
Oceania	Australia	53.7% (▲0.9%)	44.4% (+0.8%)	0.0% (+0.0%)	1.8% (+0.1%)	58.0% (▲3.6%)	22.3% (+3.7%)	0.5% (+0.2%)	18.4% (▲0.2%)
	New Zealand	26.8% (▲9.3%)	59.4% (+3.9%)	0.3% (▲0.2%)	11.8% (+4.5%)	28.4% (▲5.4%)	45.8% (▲4.0%)	0.7% (▲0.2%)	23.0% (+8.8%)
Europe	U.K.	32.1% (+3.8%)	40.1% (+6.1%)	7.1% (▲1.5%)	20.4% (▲7.6%)	21.7% (+1.3%)	29.5% (+2.2%)	8.6% (▲0.2%)	39.2% (▲3.3%)
	Switzerland	6.7% (▲2.3%)	61.4% (+15.7%)	3.4% (+0.3%)	27.5% (▲14.1%)	11.0% (+0.9%)	44.6% (+4.5%)	10.5% (▲0.7%)	31.3% (▲7.1%)
	Germany	9.5% (+3.3%)	53.8% (+1.2%)	33.1% (▲5.9%)	*	9.5% (+1.2%)	36.1% (+2.0%)	53.1% (▲3.1%)	*
	Italy	6.4% (▲1.6%)	63.5% (+21.0%)	27.6% (▲19.9%)	*	4.8% (▲0.2%)	44.5% (+10.2%)	49.7% (▲9.9%)	*
	France	15.0% (+4.1%)	53.1% (+2.5%)	27.9% (▲9.3%)	*	10.3% (▲0.5%)	41.6% (+2.1%)	46.6% (▲1.5%)	*
	Spain	7.7% (▲12.4%)	58.6% (+7.3%)	31.3% (+3.2%)	*	7.9% (+0.8%)	37.9% (+3.2%)	52.9% (▲4.0%)	*
	Ireland	18.1% (+5.5%)	77.4% (▲1.3%)	4.4% (▲4.0%)	*	28.8% (+9.8%)	58.6% (▲7.1%)	12.0% (▲2.6%)	*
	Belgium	9.7% (▲9.1%)	49.6% (▲5.6%)	17.5% (▲7.1%)	*	14.0% (▲0.2%)	31.3% (+4.2%)	53.7% (▲3.3%)	*
	Netherlands	11.4% (+3.2%)	37.9% (▲27.4%)	43.8% (+18.3%)	*	12.3% (+1.8%)	28.7% (▲12.2%)	58.0% (+10.8%)	*
	Sweden	7.0% (▲1.2%)	74.8% (+9.3%)	13.2% (▲4.5%)	4.2% (▲3.9%)	10.9% (+0.3%)	54.9% (+1.7%)	22.5% (+2.5%)	11.1% (▲4.1%)
	Russia	74.3% (▲4.9%)	24.3% (+4.0%)	0.9% (+0.6%)	0.4% (+0.4%)	61.0% (+1.8%)	24.8% (▲6.7%)	12.2% (+4.7%)	1.1% (+0.4%)
North & Latin America	U.S.	71.8% (▲3.7%)	27.4% (+4.2%)	0.4% (▲0.4%)	*	80.9% (▲2.4%)	17.8% (+2.2%)	0.8% (+0.2%)	*
	Canada	51.3% (▲10.4%)	44.9% (+11.0%)	0.2% (▲0.1%)	3.3% (▲0.4%)	66.0% (▲0.8%)	22.8% (+3.0%)	0.9% (+0.3%)	9.4% (▲2.7%)
	Mexico	57.9% (▲7.8%)	41.0% (+8.1%)	0.4% (▲0.3%)	0.1% (▲0.0%)	66.4% (▲4.3%)	31.2% (+4.4%)	1.2% (+0.2%)	0.3% (▲0.2%)
	Brazil	76.3% (+3.5%)	23.5% (▲3.1%)	0.1% (▲0.3%)	0.0% (+0.0%)	80.5% (▲8.2%)	16.7% (+8.5%)	1.8% (▲0.1%)	0.6% (▲0.2%)
	Chile	29.3% (▲5.2%)	70.4% (+5.1%)	0.1%	—	68.7% (▲8.2%)	29.0% (+7.7%)	1.2% (▲0.1%)	—
Others	United Arab Emirates	96.7% (+14.8%)	3.3% (▲14.8%)	0.0% —	0.0% —	86.7% (+4.0%)	9.0% (▲4.5%)	1.9% (+0.8%)	1.6% (▲0.1%)
	Saudi Arabia	97.0% (▲1.3%)	3.0% (+1.3%)	0.0% —	0.0% —	80.9% (▲0.0%)	18.5% (+0.9%)	0.3% (+0.0%)	0.3% (▲0.8%)
	Kuwait	96.2% (▲3.4%)	3.8% (+3.4%)	0.0% —	0.0% —	87.5% (▲0.7%)	10.1% (▲0.3%)	0.0% —	2.2% (+1.1%)
	Qatar	98.2% (+0.7%)	1.8% (▲0.7%)	0.0% (+0.0%)	0.0% (▲0.0%)	93.1% (▲1.4%)	5.6% (+1.1%)	1.1% (+0.9%)	0.1% (▲0.4%)
	South Africa	77.1% (+5.2%)	21.7% (+0.7%)	0.8% (▲5.9%)	0.2% (+0.1%)	56.0% (▲1.5%)	30.1% (+1.1%)	8.8% (▲1.1%)	2.6% (+0.3%)

Note: Figures in parentheses show the change in invoice currency shares from 2014 to 2020. The asterisk (*) denotes cases where the partner country currency is the USD or the euro. The minus sign (-) denotes cases where it is difficult to state the figures as a percentage due to the absence of actual results or because the value is minimal.

As we showed, this study provides an overview of the choice of invoice currency in Japan's exports and imports to and from the top 34 partner countries. The overall trend is toward a declining share of the USD in exports and imports. Moreover, this trend was found to be more pronounced for exports. Further, not only were there differences in invoice currency shares between imports and exports, but they also differed by region. The following summarizes the patterns in invoice currency shares by region, first for exports and then for imports.[4]

Exports to Asia

- In terms of the invoice currency shares in Japan's exports, Asian countries can be divided into three groups. The first group comprises China, Indonesia, Singapore, the Philippines, Vietnam, and India, for which the USD is the dominant invoice currency. The second group has only one country, South Korea, for which the yen is the dominant invoice currency. The third group comprises Hong Kong, Taiwan, Thailand, and Malaysia, for which the USD and the yen are on par. Why these differences are observed, even though these countries all fall into the same region and are among Japan's major trading partners, is something that requires further analysis, focusing, for example, on differences in major commodities and price competitiveness in exports to these countries.

- In recent years, the share of Japanese exports invoiced in USD has decreased, while the share invoiced in yen and the destination country's currency has increased. This is especially the case in exports to Asia. In terms of invoicing in destination country currencies, the use of the Chinese yuan, the Thai baht, and the Indian rupee has seen particularly notable increases. On the other hand, USD invoicing has increased exports to Taiwan and Vietnam, which have seen a rise in Japanese exports in recent years. In contrast, the invoicing share of the USD overall has remained unchanged when aggregating data for Asia as a whole. Thus, a key finding is that the data used in this study made it possible to identify country-specific characteristics that cannot be observed from the data compiled for the Asian region.

- Another finding is that in Japan's exports to Asia, there are notable differences in invoice currency shares on a value basis and a transactions basis. For the yen, the share tends to be more prominent on a transaction basis than on a value basis, while for the USD, the opposite is the case. This suggests that larger transactions, such as intra-firm trade, tend to be invoiced in USD, while relatively small transactions are invoiced in yen. This is another new finding of this study.

Exports to Oceania

- Since Australia and New Zealand are developed countries, there is a strong tendency for exports to both countries to be mainly invoiced in the partner country's currency or yen. When the partner country's currency is a hard currency, as in the case of these two countries, the USD is ranked third.

Exports to Europe

- For exports to countries that have adopted the euro, the euro accounts for most countries' largest share on a value basis, followed by the yen. However, on a transaction number basis, the yen share is higher and almost on par with the share of exports invoiced in euros. This indicates that the pattern of the yen being used for relatively small transactions and the euro being used for larger amounts is also evident in exports to Europe.

- In exports to countries that have not adopted the euro, such as the U.K. and Switzerland, the share of

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[4] Note that for some countries there were large changes in invoice currency shares in a short period of time. Since there were no major changes in the number of transactions for these countries, these large changes in invoice currency shares likely reflect either fluctuations in the volume of trade in a particular good or a switch in the invoice currency. When explaining large changes in invoice currency shares, it is important to distinguish whether such changes were caused by changes in the value (volume) of exports of goods that are traditionally invoiced in USD, yen, or the partner country's currency, or whether they were caused by a switch in the invoice currency – for example, if goods that were traditionally invoiced in USD started to be invoiced in yen. This is an issue we hope to examine in detail in the future.

the USD tends to be higher than in exports to other European countries.

- Exports to Eastern European countries and Turkey are predominantly invoiced in euros. This pattern has intensified in recent years in exports to Turkey.
- In exports to Russia, the Russian ruble accounts for the largest share on a value basis, remaining above 30% throughout the entire period. However, on a transaction number basis, the ruble invoice share is about 20 percentage points lower than on a value basis. On a transaction number basis, the yen accounts for the largest share, suggesting that the ruble is used as the invoice currency for large export transactions. In contrast, the yen is used for relatively small export transactions.

Exports to North America and Central and South America

- In exports to the U.S. and Mexico, the USD accounts for the largest share on a value and a transaction basis, while in exports to Canada, the USD and the Canadian dollar are on par on a value basis. Moreover, in exports to the U.S., there has been no notable change in this pattern. However, in exports to Canada and Mexico, recent years have seen a shift from the USD to the destination country currencies – i.e., the Canadian dollar and the Mexican peso. Meanwhile, in exports to Brazil, the invoice share of the USD has also been declining, while the shares of the yen and the Brazilian real have been increasing.

Exports to other regions

- The yen tends to account for the largest invoice share in exports to the oil-producing countries of the Middle East. Our previous studies, which indicate that the yen invoice is usually selected only when exporting competitive or differentiated goods, suggest that Japanese firms use the yen to invoice the differentiated goods they export to Middle Eastern countries.
- In exports to South Africa, the euro and the yen are widely used as invoice currency.

Next, we summarize the pattern of invoice currency shares for imports by region. Since imports from the U.S. and resource-rich countries, which are among Japan's top trading partners, are denominated mainly in USD, the invoice share of the USD in Japan's imports is high, and there has been little change in this pattern.

Imports from Asia

- Regarding Japanese imports from Asia, the number of countries for which the USD makes up the largest invoice share in Japanese imports is larger than the corresponding number for exports. Specifically, while the yen accounts for the largest invoice share in imports from Hong Kong, South Korea, Singapore, and the Philippines, the USD makes up the largest share in imports from all other countries. Among these, the USD invoice share has increased in recent years in imports from Taiwan and Malaysia, while the yen invoice share in imports from these countries has tended to decline. A possible explanation for this trend is the large volume of imported goods commonly invoiced in USD, such as electronic and electrical parts and components.
- Asian countries for which the USD invoice share in Japan's imports has been declining and the yen invoice share has been rising are South Korea, Indonesia, Singapore, the Philippines, Vietnam, and India.
- Comparing shares on a value basis and a transaction number basis shows that in imports from many countries, the yen invoice share is higher on a value basis than on a transaction basis. This pattern contrasts with exports and is also observed for imports from many non-Asian countries.

Imports from Oceania

- Unlike exports to Oceania, in the case of imports, USD invoicing is used more than invoicing in the partner country's currency. This is likely due to the high share of primary commodities in imports from the region. While there has been no change in the invoice currency pattern in imports from Australia,

in imports from New Zealand, there has been a slight downward trend in USD invoicing and an upward trend in New Zealand dollar invoicing.

Imports from Europe

- In trade with Europe, the share of imports invoiced in yen has increased, except for imports from France, Ireland, Belgium, and the Netherlands. In trade with the U.K. and Switzerland, the USD shares in imports and exports have decreased, while the yen and partner currency shares have increased markedly. We conjecture that the yen invoice share in imports from European countries is higher than in imports from other regions, which indicates that European firms have adopted a PTM strategy for their Japanese customers. However, the pattern varies from country to country, and further analysis is needed.

- On a value basis, most imports from Europe are invoiced in yen; on a transaction number basis, the majority are invoiced in euros. Further analysis is needed to examine how this relates to the PTM strategies of European firms.

- In imports from Russia, USD invoicing accounts for a large share. This likely mainly reflects that most imports from Russia consist of natural resources.

Imports from North America and Central and South America

- In imports from the U.S., the share of USD invoicing has been decreasing, while the share of yen invoicing has been increasing, although these changes have been relatively small. The reason for these trends and whether they are likely to continue will require particular analysis, mainly since the U.S. is Japan's second-largest import partner.

- Imports from Canada and Mexico have seen a marked decrease in the USD share and an increase in the yen share since 2019. This period coincides with the tentative agreement of the U.S.-Mexico-Canada Agreement (USMCA) to replace the North American Free Trade Agreement (NAFTA).

Imports from other regions

- In imports from the Middle East, which primarily consist of resource imports, the USD invoice share remains close to 100%. Similarly, imports from South Africa remain predominantly invoiced in USD, and the USD share has increased. This strong preference for USD invoicing in resource imports is responsible for USD invoicing continuing to dominate Japan's imports.

Previously published data on trade invoice currency shares by region showed no substantial changes in the high share of the USD in Japanese firms' choice of invoice currency. Moreover, many respondents indicated that they do not change their invoice currency much in the firm surveys conducted by Ito et al. (2010, 2011, 2015, 2016, 2017, 2019). However, the country-level analysis in this study using customs data showed that during the observation period from 2014 to 2020, a certain degree of change in the invoice currency shares was observed in the imports from and exports to individual countries. There are various possible reasons for this. For example, we conjecture that the trend of a decline in USD invoicing and a rise in partner currency invoicing in trade with Asian countries suggests that in the intra-firm trade as part of the supply chains developed in Asia, firms are beginning to adopt strategies to mitigate foreign exchange risks for their local subsidiaries by using their local currencies. Moreover, in transactions with Europe, especially on the import side, yen invoicing is rising, suggesting that European firms are increasingly pursuing a PTM strategy toward Japan. On the other hand, for some countries, such as the U.S. and Germany, there has not been much change in invoice currency shares.

5. Empirical Analysis: Determinants of Invoice Currency Choice in Japan

Various empirical investigations of the determinants of invoice currency choice have been conducted in previous studies. Typical examples are Goldberg and Tille (2008), which uses 24 sample countries and provides

evidence that the export share to the U.S. matters, and transaction costs play a minor role. Kamps (2006) uses 42 countries and confirms that a country's membership or prospective membership in the EU plays a decisive role in choosing the euro as an invoicing currency in its trade. As for a country analysis, Friberg and Wilander (2008) performs an econometric analysis on currency invoicing in Swedish exports based on questionnaire survey and confirms that firms who sell differentiated products are more likely to use kronor as their main currency for exports.

Those conducted using customs data from undisclosed countries include the following. Goldberg and Tille (2016), who use Canadian import transactions, conclude that the invoicing choice results from a bargaining process between trading partners. Chung (2016), who uses U.K. export customs data, shows that U.K. exporters relying on foreign currency-denominated imported inputs are less likely to invoice in their home currency. Chen, Chung, and Novy (2022) used U.K. import customs data and showed that Vehicle Currency Pricing (VCP) is pervasive for U.K. imports, with more than half of the transactions in their sample invoiced in neither sterling nor the exporter's currency.

An empirical study of invoice currency for Japanese firms is presented by Ito et al. (2010, 2013, 2016). Interviews and questionnaire surveys confirm that the USD invoiced share is substantial in Japanese exports, which contrasts markedly with advanced countries' exports where exporters' currency is typically chosen for export invoicing. This is mainly due to the behaviour of large firms in unifying their transactions in their supply chains in USD from the perspective of exchange rate risk management. Ito et al.'s analysis (2010, 2016) has been based on firm-level data, but the number of sample firms was small. The data used in this empirical analysis is invoice currency share data, constructed by aggregating customs data by country, including all trade transactions in Japan. As indicated in the previous section, the invoice currency share of Japan's trades varies between the yen (PCP), the USD (VCP), and the partner countries' currency (LCP) widely from country to country and even from year to year. Although all are trade transactions with Japan, they can be regarded as representing the invoice currency choice of trading partner countries. Analyzing the factors and using explanatory variables that show the characteristics of each country would be an exciting study for predicting future trends of invoice currencies in world trade.

5-1. Model and Explanatory Variables

In this section, we empirically investigate the determinants of currency shares for Japan's export and import invoicing using the cross-partner country time-series data discussed in the previous section. This analysis allows us to investigate the conditions of Japan and its partner economies and trade characteristics that would affect the choice of a currency for Japan's trade invoicing. We conduct panel data analysis with 34 countries from 2014 through 2020. In this analysis, we investigate the yen invoicing (PCP), the USD invoicing (VCP), and the partner countries' currency invoicing (LCP).

Our specification on the share of invoice currency for export or import invoicing is as follows:

$$ICS_{i,t}^c = \alpha_0^c + \alpha_1^c \cdot MF_{i,t} + \alpha_2^c \cdot ER_{i,t} + \alpha_3^c \cdot PN_{i,t} + \alpha_4^c \cdot FM_{i,t} + \varepsilon_{i,t}^c \qquad (1)$$

where $ICS_{i,t}^c$ is the invoice currency share of major currency C (either one of the yen, the USD, or the partner country's local currency) used for invoicing exports to or imports from country i in year t. Vector $MF_{i,t}$ represents the fundamental macroeconomic factors of country i, including country i's real GDP, country i's inflation differentials vis-à-vis Japan, country i's per capita income level relative to the U.S., and the total value of country i's export to, or import from Japan.

Vector $ER_{i,t}$ represents the exchange rate and system factors country i, including country i's currency's nominal exchange rate vis-à-vis the yen, nominal exchange rate volatility (standard deviation of nominal

exchange rate in previous two years), transaction cost calculated by currency i's bid-ask spread of the exchange rate vis-à-vis the yen from Bloomberg quotation, and the USD coefficient of Frankel and Wei (1994) model, which indicates the country's exchange rate system.

Vector $PN_{i,t}$ represents the production network factors of country i with Japan, including country i's share of intermediate goods in exports from Japan and country i's number of Japanese subsidiaries, and country i's share of imports from Japan in the country i's imports. In the analysis of import invoicing, we use additional factors to indicate the types of goods by processing stage, the share of primary goods, intermediate goods, and final goods in import to Japan based on the RIETI TID2020 database.[5] Vector $FM_{i,t}$ represents the degree of country i's financial market development including the degree of country i's financial openness (The Chinn-Ito index) and ratio of total foreign assets and liabilities to nominal GDP followed by Lane and Milesi-Ferretti (2003). In all sample countries, the panel is unbalanced because, in some cases, not all of the above data were available.[6] We chose a fixed effect model that included the year and country fixed effects.

Based on the previous literature on trade invoicing, we decided on the above explanatory variables for fundamental economic factors. Before discussing the empirical analysis's results, we will explain the meanings and expected coefficients of these explanatory variables.

The first determinant, suggested by many previous studies like Bacchetta and van Wincoop (2005), is the relative size of the exporting and importing countries. Firms in any country have some preference for invoicing in their currency to reduce their exchange rate risks. Such a "coalescing effect" (Goldberg and Tille, 2008) can positively affect a country's real GDP and local currency invoicing with Japan. In addition, which country bears the currency risk depends on the strength of the bargaining power between the two countries. Let us consider that trade with countries with relatively sizeable real GDP means that the power of those customers is vital. We expect a negative sign for the yen invoicing and a positive sign for the local currency invoicing. As the "coalescing effects" in Goldberg and Tille (2008), we add the indicator of relative income, which is a country's per capita income relative to that of the U.S. as a proxy for the economy's capacity to produce differentiated goods follows by Ito and Kawai (2016). Firms of highly differentiated goods may have bargaining power in the market, so we expect a positive for yen or local currency invoicing and a negative for USD invoicing.

Inflation differentials used to be included in many previous studies, which suggested that firms do not tend to use the currency with high inflation. It worked well when analyzing the European economy with high inflation rates, which tended to use the DM rather than other European currencies, such as the Italian lira and the Spanish peseta in the 1980s. This analysis covers trade with Japan, and since Japan's inflation rate is relatively low relative to other neighboring countries for the sample period, it will be interesting to see how this impacts trade invoicing with Japan. If Japan's trading partners are unwilling to reserve or accept the yen as a trade invoicing currency because holding yen does not provide any interest income, they prefer to use the USD, vehicle currency invoicing rather than the yen. Accordingly, we expect a negative effect on yen invoicing.

We use the nominal exchange rate (in logarithm) and its volatilities regarding the exchange rate-related factors. Japan's trading partners include many Asian countries. The currencies of these countries are not yet internationalized, and their exchange rates tend to be volatile, especially against the yen, which is one reason for the preference for the USD in trade with Asian countries. If the volatility is high, it is likely to negatively impact the yen invoicing and positively affect the USD invoicing. Recently, Asian currencies have been holding firm against the yen on the back of high growth potential, and it will be interesting to see how such changes in nominal exchange rates affect these currencies. In addition, we use the USD coefficient of the Frankel and Wei (1994) model, which indicates the country's exchange rate arrangement. As explained previously, some Asian countries

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[5] https://www.rieti.go.jp/jp/projects/rieti-tid/
[6] The information of all variables' descriptive statistics is in Appendix 1.

have policies to stabilize the USD, so dollar invoicing is preferred in those countries.

Previous studies have shown that production network-related explanatory variables are essential in Japanese trade invoicing. According to Ito et al. (2010, 2013, 2016, 2018, 2021), Japanese firms' choice of invoice currency depends primarily on whether the trade is intra-firm, and they tend not to use the yen to avoid imposing exchange rate risk on their overseas subsidiaries. In this analysis, we use the intermediate goods trade share as a proxy variable for the share of intra-firm trade, predicting that a higher share has a more negative impact on yen invoicing. The number of foreign subsidiaries per country is similarly used as a proxy variable for the share of intra-firm trade. For imports, while most imports of primary commodities such as crude oil are denominated in USD, we also add explanatory variables related to the nature of imported goods, given the recent tendency to use yen invoicing for final goods imports, especially from European and Asian countries.

5-2. Export Results

We run a regression equation (1) for the yen, the USD, and the partner's country currency share on a value basis. We do the same regression for the robustness check using the dataset with share on a transaction number basis, and the dataset without U.S. transactions (Appendix 2 and 3).

Table 5 reports the results for estimating invoice currency share of the yen based on export value. First, we confirm that the inflation differentials negatively affect the yen share for export invoicing. How can we interpret the result that the inflation rate differential has a negative impact on yen invoicing? For example, when exports are invoiced in yen, importers in the counterpart firms must hold yen as a reserve for payment, but since the yen interest rate is near zero, there is virtually no return to be gained by holding yen. Thus, the implication is that the importers from Japan do not want to be paid in yen. As expected, the intermediate goods share in exports from Japan to the country is found to have a negative impact on the yen invoicing. In the results using the dataset with share on a transaction number basis, we confirm that the volatilities of the nominal exchange rate negatively affect the yen share for export invoicing (Appendix 2).

Table 5: Determinants of the Japanese Yen Invoicing in Export (2014–2020)

VARIABLES	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect
lnExchange Rate	-0.0535	-0.0722	0.0248	0.0294	0.0263	0.0197	0.0456		
	(0.1390)	(0.1250)	(0.0744)	(0.0942)	(0.0751)	(0.0950)	(0.0888)		
Exchange Rate Volatility		-0.139						-0.2320	-0.1870
		(0.1460)						(0.1650)	(0.1930)
F.W.Coefficient			0.0243	0.0241	0.0212	0.0143	0.0117	0.0215	0.0205
			(0.0194)	(0.0193)	(0.0178)	(0.0188)	(0.0183)	(0.0204)	(0.0207)
Inflation Differential			-0.0065**	-0.0065**	-0.0069**	-0.0065**	-0.0060**	-0.0066*	-0.0060*
			(0.0030)	(0.0029)	(0.0033)	(0.0028)	(0.0027)	(0.0035)	(0.0035)
lnGDP				-0.0084		0.0013	-0.0470	-0.0162	-0.0346
				(0.0660)		(0.0747)	(0.0716)	(0.0543)	(0.0530)
lnTotal Export					0.0330				
					(0.0692)				
Share of Intermediate Goods						-0.1522*	-0.1472**	-0.1602**	-0.1570**
						(0.0748)	(0.0666)	(0.0689)	(0.0684)
lnFinancial Openness							-0.0760	-0.0575	
							(0.0506)	(0.0479)	
FX spread								0.1860	
								(0.1260)	
Relative Income									0.0006
									(0.0010)
Import Share									-0.5190
									(0.5190)
Constant	0.4912	0.5474*	0.2682	0.3145	-0.6481	0.369	0.9851**	0.8082*	0.6830**
	(0.3551)	(0.3160)	(0.1943)	(0.3271)	(1.8668)	(0.3481)	(0.4730)	(0.4432)	(0.3290)
Import Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	231	231	224	224	224	217	217	217	203
Number of countries	33	33	32	32	32	31	31	31	29
Within R-squared	0.0188	0.0212	0.1010	0.1010	0.1140	0.1360	0.1540	0.2080	0.2280

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 reports the results for estimating the local currency's invoice currency share based on export value. We confirm that the Frankel and Wei coefficient (hereafter, F.W. coefficient) has a negative impact on the local currency invoicing as expected. Although we have no other significant results in the share based on trade value, we have more significant results using the dataset with share on a transaction number basis (Appendix 2). The local currency share is negatively affected by the inflation differentials, and these results are identical to those for the yen share. In addition, the volatility of their nominal exchange rate vis-à-vis the Japanese yen also has a negative impact on the local currency share. Interestingly, the relative income positively impacts the local currency invoicing, which suggests that Japanese firms export to countries with relatively high GDP per capita using the country's currency.

Table 6: Determinants of the Local Currency Invoicing in Export (2014–2020)

VARIABLES	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect
lnExchange Rate	-0.0016	0.0132	0.0276	0.0130	0.0263	0.0112	0.0126		
	(0.0194)	(0.0253)	(0.0239)	(0.0291)	(0.0236)	(0.0285)	(0.0297)		
Exchange Rate Volatility		0.111						0.0959	0.0939
		(0.0956)						(0.1180)	(0.1200)
F.W.Coefficient			-0.0536**	-0.0532**	-0.0512**	-0.0457**	-0.0459**	-0.0441*	-0.0507**
			(0.0227)	(0.0220)	(0.0229)	(0.0218)	(0.0221)	(0.0226)	(0.0219)
Inflation Differential			0.0005	0.0005	0.0008	0.0009	0.0009	0.00045	0.00169
			(0.0021)	(0.0022)	(0.0019)	(0.0020)	(0.0020)	(0.0019)	(0.0019)
lnGDP			0.0270			0.0080	0.0054	0.0242	0.0157
			(0.0545)			(0.0517)	(0.0490)	(0.0446)	(0.0467)
lnTotal Export				-0.0240					
				(0.0196)					
Share of Intermediate Goods						-0.0599	-0.0597	-0.0691	-0.1220
						(0.0643)	(0.0643)	(0.0640)	(0.0808)
lnFinancial Openness							-0.0041	-0.0014	
							(0.0454)	(0.0436)	
FX spread								-0.0261	
								(0.0249)	
Relative Income									0.0011
									(0.0011)
Import Share									-0.5230
									(0.4700)
Constant	0.2240***	0.1791**	0.1862***	0.0401	0.8533	0.2070	0.2404	0.2542	0.6130
	(0.0499)	(0.0677)	(0.0565)	(0.3203)	(0.5640)	(0.2880)	(0.3601)	(0.3550)	(0.3622)
Import Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	230	230	223	223	223	216	216	216	203
Number of countries	33	33	32	32	32	31	31	31	29
Within R-squared	0.0316	0.0346	0.0715	0.0733	0.0815	0.1020	0.1020	0.1030	0.1600

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 reports the results for estimating USD invoice currency share based on export value. At first, the yen's depreciation increases the USD invoicing. In addition, the Japanese exporter chooses USD invoicing if the F.W. coefficient is higher, i.e., if the exporting partner has an exchange rate policy linked to the dollar. Although we have no significant results about the inflation differentials in the share based on trade value, we have significant results using the dataset with share on a transaction number basis (Appendix 2). Contrary to the yen and the local currency invoicing, the inflation differentials positively affect the USD share. During this analysis's sample period, Japan's inflation was generally low relative to other countries. Countries with large inflation rate disparities with Japan are often emerging rather than advanced countries. The results suggest that exporters to emerging markets with high inflation rates choose the USD, vehicle currency invoicing. Contrary to the yen case, a higher intermediate goods trade share results in more dollar-invoiced exports. This result is consistent with our previous research showing that intra-firm trade with foreign subsidiaries tends to unify all their trade transactions with the USD. Interestingly, the relative income has a negative impact on the USD invoicing, which suggests that Japanese firms export to countries with relatively high GDP per capita using their local currency invoicing, not the USD, a vehicle currency invoicing.[7]

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[7] We confirm this result with data excluding trade to the U.S.

Table 7: Determinants of the USD Invoicing in Export (2014–2020)

VARIABLES	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect
lnExchange Rate	0.1500*	0.1431*	0.0726*	0.1120*	0.0717*	0.1253*	0.1131*		
	(0.0785)	(0.0757)	(0.0407)	(0.0643)	(0.0401)	(0.0635)	(0.0586)		
Exchange Rate Volatility		-0.0519						-0.1070	-0.0706
		(0.1660)						(0.1380)	(0.1920)
F.W.Coefficient			0.0244	0.0232	0.0263	0.0274	0.0286	0.0387*	0.0460**
			(0.0211)	(0.0212)	(0.0201)	(0.0214)	(0.0207)	(0.0213)	(0.0190)
Inflation Differential			0.0040	0.0042	0.0042	0.0038	0.0035	0.0038	0.0014
			(0.0029)	(0.0030)	(0.0033)	(0.0028)	(0.0028)	(0.0033)	(0.0030)
lnGDP				-0.0729		-0.0648	-0.0418	0.0145	0.0740
				(0.0771)		(0.0679)	(0.0652)	(0.0512)	(0.0555)
lnTotal Export					-0.0208				
					(0.0721)				
Share of Intermediate Goods						0.2241**	0.2212**	0.1821**	0.1992**
						(0.0978)	(0.0947)	(0.0761)	(0.0910)
lnFinancial Openness							0.0363	0.0462	
							(0.0555)	(0.0523)	
FX spread								-0.1740	
								(0.1340)	
Relative Income									-0.0026*
									(0.0014)
Import Share									0.6350
									(0.5720)
Constant	-0.0139	0.0069	0.1600	0.5550	0.7390	0.3410	0.0468	0.1630	-0.3510
	(0.2020)	(0.1950)	(0.1022)	(0.4214)	(1.9721)	(0.3573)	(0.4762)	(0.4670)	(0.4144)
Import Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	231	231	224	224	224	217	217	217	203
Number of countries	33	33	32	32	32	31	31	31	29
Within R-squared	0.1180	0.1180	0.0700	0.0777	0.0745	0.1300	0.1340	0.1710	0.2390

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The almost same analysis was performed with the share of the number of transactions as the explained variable and with data excluding trade to the U.S. from the sample, with almost the same results. A table of these results is presented in the Appendix 2 and 3.

5-3.   Import Results

Next, we show the results for import. Table 8 reports the results for estimating invoice currency share of the yen based on value in import. Contrary to the results in exports, the inflation differentials positively affect the yen share for import invoicing. The most interesting result is that the export share of the final goods is positive in yen invoicing. Just as Japanese firms choose the partner currency for important export destinations and adopt a PTM strategy, we confirm that foreign firms exporting to Japan adopt a PTM strategy when exporting to Japan because they consider Japan to be an essential market for their final goods exports.

Table 8: Determinants of the Japanese Yen Invoicing in Import (2014–2020)

VARIABLES	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect
lnExchange Rate	0.0133	0.0252	0.00660	0.0326	0.0215	0.0219	0.0293	0.0202	0.0228	0.0228
	(0.0339)	(0.0285)	(0.0319)	(0.0284)	(0.0265)	(0.0273)	(0.0277)	(0.0274)	(0.0286)	(0.0277)
Exchange Rate Volatility		0.1680		0.0904	0.1220	0.1391	0.0743	0.1612	0.1800	0.1353
		(0.1030)		(0.1030)	(0.1000)	(0.1050)	(0.0991)	(0.1090)	(0.1080)	(0.1080)
F.W.Coefficient			0.0114							
			(0.0166)							
Inflation Differential				0.0017*	0.0010	0.0013	0.0013	0.0012	0.0011	0.0013
				(0.0009)	(0.0011)	(0.0010)	(0.0010)	(0.0010)	(0.0009)	(0.0009)
lnGDP				-0.0423						
				(0.0354)						
lnTotal Import					0.0144	0.0090	0.0193	0.0092	0.0117	0.0092
					(0.0154)	(0.0142)	(0.0161)	(0.0141)	(0.0135)	(0.0141)
lnFinancial Openness					0.0296					
					(0.0236)					
FX spread						-0.0085	-0.0099	-0.0108	-0.0205	-0.0090
						(0.0188)	(0.0209)	(0.0192)	(0.0174)	(0.0182)
Relative Income							-0.0515			
							(0.0319)			
Share of Intermediate Goods								-0.0355		
								(0.0321)		
Share of Final Goods									0.1230**	
									(0.0543)	
Share of Primary Goods										-0.0163
										(0.0246)
Constant	0.2691***	0.2352***	0.2760***	0.5080**	-0.3010	-0.0062	-0.1030	0.0053	-0.1290	-0.0116
	(0.0717)	(0.0603)	(0.0682)	(0.2400)	(0.5110)	(0.4160)	(0.4330)	(0.4160)	(0.3980)	(0.4150)
Export Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	238	238	238	238	238	238	238	238	238	238
Number of countries	34	34	34	34	34	34	34	34	34	34
Within R-squared	0.0555	0.0756	0.0615	0.1080	0.1040	0.0907	0.1390	0.1080	0.1730	0.0936

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9 reports the results for estimating the local currency's invoice currency share based on import value. We find that the volatility in the exchange rate against the yen positively impacts local currency invoicing. This means that import partners prefer to be paid in their currency rather than in the yen or the USD when the exchange rate against the yen is highly volatile. The total import value negatively affects local currency invoicing. This implies that the large value of Japan's imports means that Japan is an important export partner and does not use its currency to impose foreign exchange risk on Japanese firms. It was also confirmed that the higher the transaction cost of the exchange, the less the local currency is used. The result is that the higher the relative income, the more imports are invoiced in the country's currency. This is consistent with previous studies findings that the producing country's currency tends to be chosen when the imported material is a competitive good.

Table 9: Determinants of the Local Currency Invoicing in Import (2014–2020)

VARIABLES	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect
lnExchange Rate	-0.0122	-0.0131	-0.00518	-0.0206	-0.00945	-0.0114	-0.0197	-0.0110	-0.0117	-0.0117
	(0.0136)	(0.0151)	(0.0162)	(0.0172)	(0.0143)	(0.0131)	(0.0139)	(0.0130)	(0.0129)	(0.0132)
Exchange Rate Volatility		-0.0125		0.0497	0.0322	0.0341	0.1110**	0.0287	0.0240	0.0353
		(0.0420)		(0.0458)	(0.0423)	(0.0458)	(0.0531)	(0.0501)	(0.0523)	(0.0461)
F.W.Coefficient			-0.0120							
			(0.0109)							
Inflation Differential				-0.0011	-0.0002	-0.0004	-0.0004	-0.0004	-0.0003	-0.0004
				(0.0007)	(0.0008)	(0.0007)	(0.0006)	(0.0007)	(0.0007)	(0.0007)
lnGDP				0.0384						
				(0.0228)						
lnTotal Import					-0.0243**	-0.0173*	-0.0270**	-0.0174*	-0.0180*	-0.0174*
					(0.0109)	(0.0091)	(0.0112)	(0.0091)	(0.0093)	(0.0091)
lnFinancial Openness					-0.0337*					
					(0.0177)					
FX spread						-0.0397*	-0.0400**	-0.0392*	-0.0368*	-0.0396*
						(0.0197)	(0.0171)	(0.0197)	(0.0196)	(0.0196)
Relative Income							0.0489**			
							(0.0196)			
Share of Intermediate Goods								0.0088		
								(0.0174)		
Share of Final Goods									-0.0306	
									(0.0488)	
Share of Primary Goods										0.0041
										(0.0091)
Constant	0.2080***	0.2111***	0.2021***	-0.0355	1.0432***	0.6912**	0.7911***	0.6880**	0.7223**	0.6920**
	(0.0300)	(0.0342)	(0.0324)	(0.1350)	(0.3740)	(0.2580)	(0.2740)	(0.2570)	(0.2690)	(0.2590)
Export Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	238	238	238	238	238	238	238	238	238	238
Number of countries	34	34	34	34	34	34	34	34	34	34
Within R-squared	0.0235	0.0237	0.0369	0.0681	0.1060	0.0900	0.1470	0.0921	0.1000	0.0903

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10 reports the results for estimating USD invoice currency share based on import value. We confirm that the volatility in the exchange rate against the yen has a negative impact on USD invoicing. While previous studies indicated a preference for the vehicle currency invoicing, the USD, rather than the yen, when exchange rate volatility is high, this study shows a preference for the local currency rather than the USD. This result is also the same as the data without U.S. trade. However, the results also confirm that the higher the transaction cost of a currency, the more the USD is used as an invoicing currency in imports. This suggests Japanese firms are more concerned with currency transaction costs than exchange rate volatility when importing. Finally, the final goods export share is negative in the USD invoicing, consistent with the results in the yen invoicing.

Similar to the case of exports, the almost same analysis was performed with the share of the number of transactions as the explained variable and with data excluding trade to the U.S. from the sample, with almost the same results. A table of these results is presented in the Appendix 4 and 5.

Table 10: Determinants of the USD Invoicing in Import (2014–2020)

VARIABLES	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect
lnExchange Rate	-0.0014	-0.0097	-0.0071	-0.0150	-0.0099	-0.0085	-0.0105	-0.0069	-0.0093	-0.0091
	(0.0284)	(0.0242)	(0.0281)	(0.0265)	(0.0251)	(0.0239)	(0.0253)	(0.0243)	(0.0238)	(0.0240)
Exchange Rate Volatility		-0.1160		-0.0740	-0.1171	-0.1350	-0.1213	-0.1540	-0.1691*	-0.1320
		(0.1070)		(0.1080)	(0.1030)	(0.1014)	(0.1000)	(0.1030)	(0.0992)	(0.1030)
F.W.Coefficient			0.0099							
			(0.0129)							
Inflation Differential				-0.0007	-0.0008	-0.0009	-0.0009	-0.0009	-0.0007	-0.0009
				(0.0010)	(0.0010)	(0.0010)	(0.0011)	(0.0011)	(0.0010)	(0.0010)
lnGDP				0.0270						
				(0.0395)						
lnTotal Import					0.0123	0.0111	0.00694	0.0109	0.0087	0.0109
					(0.0088)	(0.0095)	(0.0088)	(0.0094)	(0.0085)	(0.0095)
lnFinancial Openness					0.0025					
					(0.0214)					
FX spread						0.0428*	0.0445*	0.0448*	0.0530**	0.0432*
						(0.0235)	(0.0249)	(0.0236)	(0.0242)	(0.0235)
Relative Income							0.0201			
							(0.0323)			
Share of Intermediate Goods								0.0320		
								(0.0316)		
Share of Final Goods									-0.1041**	
									(0.0471)	
Share of Primary Goods										0.0115
										(0.0176)
Constant	0.5150***	0.5381***	0.5212***	0.3662	0.1841	0.2244	0.2561	0.2142	0.3293	0.2280
	(0.0604)	(0.0523)	(0.0593)	(0.2510)	(0.2880)	(0.2790)	(0.2690)	(0.2840)	(0.2400)	(0.2790)
Export Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	238	238	238	238	238	238	238	238	238	238
Number of countries	34	34	34	34	34	34	34	34	34	34
Within R-squared	0.0589	0.0714	0.0647	0.0850	0.0846	0.0981	0.1220	0.1160	0.1740	0.0999

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. Conclusion

The country-level invoice currency shares revealed by this study indicate that in trade with many countries, the invoice share of the yen is higher than the previously published data on currency shares for the world as a whole or by region. While the data for Japan's trade overall give the strong impression that, compared to other countries, a much higher share of imports and exports are invoiced in the USD and a lower share in the domestic currency (i.e., the yen), the analysis here showed that this is mainly due to the choice of currency used in trade with the U.S., China, and resource-rich countries, which account for large shares of Japan's trade. The finding using country-level data that, on a trade value basis, to a certain extent, the yen is chosen as the invoice currency and, on a transaction number basis, an even larger share of trade is invoiced in yen, is a significant contribution both in the field of academia and for industry.

The same can be said about the use of partner country currencies. For example, the Thai baht, which, according to previously available data, was used as an invoice currency in only 1% of exports to Asia, was found to be used in 16% of exports to Thailand on a value basis and 17% on a transaction number basis. Moreover, not only were exports invoiced in the partner country currency in the case of advanced country currencies such as the Australian dollar (invoice share on an export value basis in 2020: 61.7%), Canadian dollar (46.8%), and New Zealand dollar (36.8%), but also to some extent in the case of emerging market currencies such as the Russian ruble (37.2%), Mexican peso (11.7%), Chinese yuan (10.4%), Indian rupee (9.6%), and Brazilian real (8.9%). Such information benefits firms newly starting trade with these countries and compiling and analyzing such data

is of great significance.

From our empirical analysis exploring the determinants of invoice currency, we confirm our previous studies' tendency that the intermediate goods trade share reduces the yen invoicing and increases the USD invoicing in export. We also confirm that the higher the import of the final goods, the more likely it is to use the yen invoicing in import, which explains the high yen invoice share of imports from Europe. The emerging currency invoicing share is significantly negatively related to the F.W. coefficient and transaction costs, which has been confirmed in other previous studies. In recent years, policies to lower transaction costs of local currencies, such as the internationalization policy of the Chinese yuan and the LCSF of ASEAN countries, have been actively implemented, and Asian currency-denominated transactions may further increase Japan's trade in the future.

One concern is that the widening of the inflation gap and the depreciation of the yen have a negative impact on yen invoicing. The recent trend of yen depreciation and an inflationary gap between Japan and its major trading partner countries mean that Japanese firms will be further exposed to foreign exchange risk. What mechanisms are at work to negatively impact yen invoicing will need to be further investigated.

The U.S.-China trade war that broke out in 2019, the COVID-19 pandemic and supply shortages of intermediate goods such as semiconductors since the following year, and the hike in resource prices due to Russia's invasion of Ukraine are leading to the restructuring of Japanese firms' supply chains and changes in the composition of goods traded (such as a decrease in automotive-related parts and increase in electronic parts). The trend toward a weaker yen, which has become more pronounced since early 2022, may bring about even more significant structural changes in Japanese exports and imports, including the return of some supply chains to the domestic market in the future. To determine what factors are driving preferences for invoicing in the USD, yen, or trade partner currency, it will be necessary to combine country-level information on the type of goods traded (by item and by processing stage/type of process) and trading partners (intra- or inter-firm trade), as well as information on the exchange rate system and exchange rate fluctuations in the partner country currency, and examine the determinants of the choice of invoice currency in detail based on such information. We wish to tackle these issues in the future.

References

伊藤隆敏・鯉渕賢・佐藤清隆・清水順子（2011）「貿易ネットワークにおけるインボイス通貨選択と
　　為替リスク管理：「平成 22 年度日本企業海外現地法人アンケート調査」結果概要」、*RIETI
　　Discussion Paper*、No.11-J-070、RIETI。

伊藤隆敏・鯉渕賢・佐藤清隆・清水順子（2015）「日本企業の為替リスク管理とインボイス通貨選択：
　　平成 26 年度日本企業海外現地法人アンケート調査結果概要」、*RIETI Discussion Paper*、15-J-054。

伊藤隆敏・鯉渕賢・佐藤清隆・清水順子（2017）「日本企業の為替リスク管理とインボイス通貨選択：
　　「2017 年度日本企業の貿易建値通貨の選択に関するアンケート調査」結果」、*RIETI Discussion
　　Paper*、18-J-025。

伊藤隆敏・鯉渕賢・佐藤清隆・清水順子・吉見太洋（2019）「日本企業の為替リスク管理とインボイ
　　ス通貨選択　平成 30 年度日本企業の海外現地法人アンケート調査結果概要」、*RIETI Discussion
　　Paper*、19-J-042。

Bacchetta, Philippe and Eric van Wincoop (2005) "A Theory of the Currency Denomination of International
　　Trade," *Journal of International Economics*, 67(2), 295–319.

Chen, Natalie, Wanyu Chung and Dennis Novy (2022) "Vehicle Currency Pricing and Exchange Rate Pass-
　　Through," *Journal of the European Economic Association,* 20(1), 312–351.

Chung, Wanyu (2016). "Imported Inputs and Invoicing Currency Choices: Theory and Evidence Using UK
　　Transaction Data," *Journal of International Economics,* 99, 237–250.

Frankel, Jeffrey A., S.J. Wei (1994) "Yen Bloc or Dollar Bloc? Exchange Rate Policies of the East Asian
　　Economies," in T. Ito and A. Krueger (eds.) *Macroeconomic Linkage: Savings, Exchange Rates, and Capital
　　Flows*, University of Chicago Press.

Friberg, Richard, and Fredrik Wilander (2008) "The Currency Denomination of Exports—A Questionnaire
　　Study," *Journal of International Economics*, 75(1), 54–69.

Goldberg, Linda S. and Cedric Tille (2008) "Vehicle Currency Use in International Trade," *Journal of International
　　Economics*, 76, 177–192.

Goldberg, Linda S. and Cedric Tille (2016) "Micro, Macro, and Strategic Forces in International Trade Invoicing:
　　Synthesis and Novel Patterns," *Journal of International Economics*, 102, 173–187.

Grassman, Sven (1973) "A Fundamental Symmetry in International Payments," *Journal of International
　　Economics*, 3, 105–116.

Grassman, Sven (1976) "Currency Distribution and Forward Cover in Foreign Trade," *Journal of International
　　Economics*, 6, 215–221.

Ito, Hiro and Masahiro Kawai (2016) "Trade Invoicing in Major Currencies in the 1970s–1990s: Lessons for
　　Renminbi Internationalization," *Journal of the Japanese and International Economies*, 42, 123–145.

Ito, Takatoshi, Satoshi Koibuchi, Kiyotaka Sato, and Junko Shimizu (2010) "Why Has the Yen Failed to Become
　　a Dominant Invoicing Currency in Asia? A Firm-Level Analysis of Japanese Exporters' Invoicing
　　Behaviour," *NBER Working Paper*, No.16231, NBER.

Ito, Takatoshi, Satoshi Koibuchi, Kiyotaka Sato, and Junko Shimizu (2013) "Choice of Invoicing Currency: New
　　Evidence from a Questionnaire Survey of Japanese Export Firms," *RIETI Discussion Paper*, No.13-E-034,
　　RIETI.

Ito, Takatoshi, Satoshi Koibuchi, Kiyotaka Sato, and Junko Shimizu (2016) "Choice of Invoice Currency in
　　Japanese Trade: Industry and Commodity Level Analysis," *RIETI Discussion Paper*, No.16-E-031, RIETI.

Ito, Takatoshi, Satoshi Koibuchi, Kiyotaka Sato and Junko Shimizu (2018) "*Managing Currency Risk*," Edward
　　Elgar.

Ito, Takatoshi, Satoshi Koibuchi, Kiyotaka Sato, Junko Shimizu and Taiyo Yoshimi (2021) "The Dollar, the Yen,

or the RMB? A Survey Data Analysis of Invoicing Currencies among Japanese Overseas Subsidiaries," *RIETI Discussion Paper*, No.21-E-016, RIETI.

Kamps, Annette (2006) "The Euro as Invoicing Currency in International Trade," *Working Paper*, No.665, European Central Bank.

Lane, Philip R., and Gian Maria Milesi-Ferretti (2003) "International Financial Integration," *IMF Working Paper*, WP/03/86, IMF.

McKinnon, Ronald I. (1979) "*Money in International Exchange: The Convertible Currency System*," Oxford University Press.

Page, S. A. B. (1977) "Currency of Invoicing in Merchandise Trade," *National Institute Economic Review*, 81, 77–81.

Page, S. A. B. (1981) "The Choice of Invoicing Currency in Merchandise Trade," *National Institute Economic Review*, 98, 60–72.

Shimizu, Junko, Takatoshi Ito, Kiyotaka Sato, Satoshi Koibuchi (2021) "*Japanese Firms' Foreign Exchange Risk Management – Rationality, Strategy and Puzzle of Invoice Currency Choice* (Japanese)", NIKKEI BP.

Appendix 1: Information of All Variables' Descriptive Statistics

Information of All Variables' Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Export					
Yen Invoice Share (value based)	238	0.3654	0.1549	0.0650	0.8437
USD Invoice Share (value based)	238	0.3588	0.2141	0.0474	0.8806
Local Currency Invoice Share (value based)	237	0.2218	0.2579	0.0000	0.8806
Yen Invoice Share (transaction number based)	238	0.4878	0.1670	0.1619	0.9592
USD Invoice Share (transaction number based)	238	0.2786	0.2018	0.0097	0.8110
Local Currency Invoice Share (transaction number based)	238	0.1813	0.2215	0.0000	0.7934
Country Specific Data					
Total Export Value	238	27.6685	1.1650	25.0551	30.4223
Log GDP	231	1977.6430	3803.8340	49.9215	21372.5700
Number of Subsidiaries of Japanese Firms	238	710.3739	1184.2670	18.0000	6670.0000
Chinn & Ito Index	231	1.1953	1.3713	-1.2262	2.3220
FX Spread (Bid-Ask Spread in Bloomberg quotation)	224	0.0926	0.0982	0.0041	0.4933
Nominal Exchange Rate (v.s. the Japanese yen)	231	52.0330	52.9902	0.0046	186.2216
Exchange Rate Volatilities (in 2 years)	231	0.0542	0.0328	0.0122	0.1965
Inflation Differential (CPI difference with Japan)	231	1.4639	2.7546	-2.9868	15.3434
Financial Market Openness Index [1]	238	201.7775	227.3909	20.6407	1036.8540
Frankel & Wei Coefficient [2]	238	0.5575	0.3459	0.0000	1.3851
Import Share from Japan in the Country's Total Imports	210	0.0529	0.0395	0.0073	0.1772
Relative Income [3]	231	46.7314	35.1128	2.8887	160.2598
Intermediate Goods Share in Export from Japan	217	0.5641	0.1546	0.2136	0.8166
Import					
Yen Invoice Share (value based)	238	0.3021	0.1411	0.0406	0.6592
USD Invoice Share (value based)	238	0.5084	0.2849	0.0476	0.9510
Local Currency Invoice Share (value based)	238	0.1797	0.2271	0.0000	0.8332
Yen Invoice Share (transaction number based)	238	0.3938	0.2119	0.0040	0.9162
USD Invoice Share (transaction number based)	238	0.4919	0.3017	0.0559	0.9960
Local Currency Invoice Share (transaction number based)	238	0.1142	0.1765	0.0000	0.7543
Country Specific Data					
Total Import Value	238	27.8793	0.9493	26.1605	30.6080
Log GDP	238	6.7373	1.1410	4.6631	9.9699
Number of Subsidiaries of Japanese Firms	238	698.5294	1189.5540	2.0000	6670.0000
Chinn & Ito Index	224	1.1600	1.3778	-1.2262	2.3220
FX Spread (Bid-Ask Spread in Bloomberg quotation)	238	0.0778	0.0839	0.0041	0.4933
Nominal Exchange Rate (v.s. the Japanese yen)	238	52.6202	54.8761	0.0025	186.2216
Exchange Rate Volatilities (in 2 years)	238	0.0470	0.0282	0.0116	0.1965
Inflation Differential (CPI difference with Japan)	224	1.4860	2.7883	-2.9868	15.3434
Financial Market Openness Index [1]	238	263.2893	320.6911	20.6407	1815.3390
Frankel & Wei Coefficient [2]	238	0.5866	0.3380	0.0000	1.3851
Export Share to Japan in the Country's Total Exports	238	0.0549	0.0512	0.0000	0.2622
Relative Income [3]	238	54.1843	37.9013	2.8887	168.9007
Final Goods Share in Japanese Import from the Country [4]	238	0.3593	0.2339	0.0000	0.8424
Intermediate Goods Share in Japanese Import from the Country [4]	238	0.4091	0.1773	0.0499	0.9628
Primary Goods Share in Japanese Import from the Country [4]	238	0.2317	0.2852	0.0006	0.9501

Authors' calculation.

Note 1: Financial Openness is the ratio of total foreign assets and liabilities to nominal GDP followed by Lane and Milesi-Ferretti (2003).

Note 2: F.W. coefficient is a country's currency's USD coefficient of Frankel and Wei (1994) regression model.

Note 3: Relative income is calculated by a country's per capita income relative to that of U.S. followed by Ito and Kawai (2016).

Note 4: Data are based on RIETI TID Data 2020 (https://www.rieti.go.jp/en/projects/rieti-tid/).

Appendix 2: Share based on Transaction Number (Export)

Share based on Transaction Number (EXPORT)

VARIABLES	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect
lnExchange Rate	0.022	0.007	0.037	0.051	0.059			-0.026	-0.055	-0.0571*	-0.030	-0.041	-0.047			0.039	0.0692*	0.0686*	0.040	0.047	0.053		
	(0.0479)	(0.0441)	(0.0362)	(0.0438)	(0.0460)			(0.0243)	(0.0336)	(0.0310)	(0.0231)	(0.0347)	(0.0344)			(0.0290)	(0.0343)	(0.0384)	(0.0305)	(0.0357)	(0.0351)		
Exchange Rate Volatility		-0.1181*				-0.097	-0.123	-0.217*						-0.100	-0.101		0.225**					0.062	0.065
		(0.0615)				(0.1050)	(0.1030)	(0.1110)						(0.1100)	(0.1190)		(0.0945)					(0.0910)	(0.0971)
F.W.Coefficient			0.001	0.001	0.000	0.007	0.011			-0.0323**	-0.0324**	-0.0332**	-0.0336**	-0.0382**	-0.0404**			0.0273**	0.0275***	0.0265**	0.0268**	0.0322***	0.0341***
			(0.0142)	(0.0143)	(0.0150)	(0.0149)	(0.0150)			(0.0156)	(0.0157)	(0.0161)	(0.0157)	(0.0165)	(0.0173)			(0.0105)	(0.0100)	(0.0105)	(0.0098)	(0.0094)	(0.0101)
Inflation Differential			-0.0031**	-0.0029**	-0.0027**	-0.0031**	-0.0036**			-0.0029**	-0.0027**	-0.0026**	-0.0024**	-0.0017	-0.0015			0.0045***	0.0042***	0.0041***	0.0039***	0.0033**	0.0029*
			(0.0011)	(0.0012)	(0.0012)	(0.0014)	(0.0014)			(0.0012)	(0.0012)	(0.0012)	(0.0012)	(0.0014)	(0.0015)			(0.0013)	(0.0012)	(0.0012)	(0.0012)	(0.0015)	(0.0016)
lnGDP				-0.0237	-0.0407	0.0152	0.0068			0.0509		0.0242	0.0238	-0.0548	-0.0558			-0.0524		-0.0222	-0.0218	0.0523	0.0519
				(0.0344)	(0.0407)	(0.0386)	(0.0360)			(0.0428)		(0.0509)	(0.0498)	(0.0515)	(0.0535)			(0.0390)		(0.0443)	(0.0437)	(0.0456)	(0.0469)
lnTotal Export			0.0007								-0.0077								0.0065				
			(0.0081)								(0.0112)								(0.0120)				
Share of Intermediate Goods				-0.0105	-0.0087	-0.0234	-0.0078					0.0035	0.0020	0.0105	0.0039					-0.0079	-0.0065	-0.0183	-0.0085
				(0.0461)	(0.0435)	(0.0514)	(0.0443)					(0.0282)	(0.0279)	(0.0199)	(0.0228)					(0.0314)	(0.0315)	(0.0286)	-0.033
lnFinancial Openness				-0.0270								-0.0363	-0.0380							0.0255	0.0272		
				(0.0296)								(0.0288)	(0.0290)							(0.0216)	(0.0219)		
FX spread				-0.0044									-0.0420								0.0402		
				(0.0196)									(0.0276)								(0.0355)		
Relative Income						0.000	-0.001							0.0018**	0.0020**							-0.0015*	-0.0017*
						(0.0007)	(0.0007)							(0.0008)	(0.0008)							(0.0008)	(0.0008)
							-0.3390								0.1420								0.1180
							(0.4950)								(0.1170)								(0.2810)
Constant	0.421***	0.468***	0.348*	0.498***	0.718**	0.395	0.485**	0.243***	0.330***	0.005	0.496	0.313	0.342	0.492	0.506	0.190**	0.100	0.459*	-0.006	0.204	0.175	0.009	0.018
	(0.123)	(0.112)	(0.188)	(0.177)	(0.292)	(0.235)	(0.211)	(0.062)	(0.090)	(0.260)	(0.346)	(0.369)	(0.365)	(0.322)	(0.338)	(0.074)	(0.091)	(0.244)	(0.371)	(0.337)	(0.335)	(0.285)	(0.301)
Import Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	231	231	224	217	217	217	203	231	231	224	224	217	217	217	203	231	231	224	224	217	217	217	203
Number of countries	33	33	32	31	31	31	29	33	33	32	32	31	31	31	29	33	33	32	32	31	31	31	29
Within R-squared	0.069	0.077	0.129	0.141	0.148	0.134	0.155	0.107	0.133	0.210	0.198	0.223	0.231	0.235	0.245	0.266	0.300	0.418	0.401	0.449	0.459	0.453	0.465

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 3: Share based on Value without US Sample (Export)

Share based on Value without US sample (EXPORT)

VARIABLES	JPY	JPY	JPY	JPY	JPY	JPY	JPY	JPY	Local	Local	Local	Local	Local	Local	Local	Local	USD	USD	USD	USD	USD	USD	USD	USD	USD
	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect
lnExchange Rate	0.0210	0.00644	0.0202	0.0444	0.0344	0.0478	0.0560	0.0763	-0.0224	-0.0542	-0.00384	-0.0524*	-0.0251	-0.0481	-0.0233	0.0248	0.0403	0.0702*	0.0240	0.0428	0.0711*	0.0431	0.0497	0.0498	0.0638
	(0.0486)	(0.0449)	(0.0479)	(0.0457)	(0.0372)	(0.0450)	(0.0478)	(0.0878)	(0.0239)	(0.0330)	(0.0148)	(0.0302)	(0.0228)	(0.0314)	(0.0278)	(0.0286)	(0.0295)	(0.0349)	(0.0255)	(0.0315)	(0.0392)	(0.0313)	(0.0366)	(0.0335)	(0.0532)
Exchange Rate Volatility		-0.110*								-0.238**								0.225**							
		(0.0624)								(0.107)								(0.0966)							
F.W.Coefficient			0.0020	0.0008	0.0010	0.0015	0.0006	0.0150			-0.0420**	-0.0331**	-0.0332**	-0.0327*	-0.0340**	-0.0551**			0.0368**	0.0277**	0.0268**	0.0270**	0.0261**	0.0268***	0.0335
			(0.0178)	(0.0139)	(0.0142)	(0.0143)	(0.0150)	(0.0196)			(0.0192)	(0.0158)	(0.0159)	(0.0163)	(0.0149)	(0.0208)			(0.0152)	(0.0102)	(0.0106)	(0.0101)	(0.0106)	(0.00894)	(0.0201)
Inflation Differential				-0.0031**	-0.0032**	-0.0031**	-0.0029**	-0.0066*				-0.0028**	-0.0025**	-0.0027**	-0.0020**	0.003				0.0044***	0.0046***	0.0043***	0.0042***	0.0040***	0.0022
				(0.0012)	(0.0011)	(0.0012)	(0.0013)	(0.0033)				(0.0013)	(0.0012)	(0.0013)	(0.0011)	(0.0018)				(0.0013)	(0.0013)	(0.0012)	(0.0012)	(0.0011)	(0.0029)
lnGDP				-0.0186		-0.0232	-0.0391	-0.0627				0.0512		0.0469	-0.0327	-0.0302					-0.0524		-0.0233	0.0168	0.0233
				(0.0339)		(0.0345)	(0.0411)	(0.0836)				(0.0430)		(0.0463)	(0.0510)	(0.0470)					(0.0391)		(0.0445)	(0.0495)	(0.0652)
lnTotal Export					0.00069								-0.00770									0.00655			
					(0.0080)								(0.0114)									(0.0119)			
Share of Intermediate Goods						-0.0105	-0.0087	-0.1540***						0.00162		-0.111							-0.00752		0.248**
						(0.0455)	(0.0432)	(0.0551)						(0.0282)		(0.0805)							(0.0311)		(0.0936)
lnFinancial Openness							-0.0255	-0.0652							-0.0379	-0.0349							0.0243	0.0151	0.0645
							(0.0305)	(0.0459)							(0.0277)	(0.0488)							(0.0216)	(0.0229)	(0.0464)
FX spread							-0.0055	0.2070							-0.0392	-0.0102							0.0413		-0.198
							(0.0200)	(0.122)							(0.0258)	(0.0248)							(0.0342)		(0.121)
Relative Income								0.0004							0.0016**	0.0013								-0.0015*	-0.0022
								(0.0010)							(0.0007)	(0.0012)								(0.0008)	(0.0014)
Import Share								-0.6750								-0.5790									1.091*
								(0.4770)								(0.4750)									(0.6400)
Constant	0.435***	0.477***	0.435***	0.483***	0.365*	0.510***	0.716***	0.975*	0.214***	0.307***	0.194***	-0.026	0.462	-0.012	0.565*	0.613	0.174**	0.086	0.191***	0.154*	0.435*	-0.028	0.196	0.029	-0.351
	(0.121)	(0.111)	(0.120)	(0.169)	(0.185)	(0.174)	(0.293)	(0.523)	(0.059)	(0.086)	(0.042)	(0.259)	(0.349)	(0.269)	(0.323)	(0.362)	(0.074)	(0.090)	(0.066)	(0.079)	(0.242)	(0.367)	(0.333)	(0.344)	(0.414)
Import Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	224	224	224	217	217	210	210	203	224	224	224	217	217	210	217	203	224	224	224	217	217	217	210	217	203
Number of countries	32	32	32	31	31	30	30	29	32	32	32	31	31	30	31	29	32	32	32	31	31	31	30	31	29
Within R-squared	0.0655	0.0725	0.0657	0.130	0.128	0.140	0.146	0.228	0.117	0.147	0.175	0.217	0.205	0.219	0.271	0.160	0.260	0.294	0.316	0.397	0.416	0.399	0.446	0.472	0.239

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix 4: Share based on Transaction Number (Import)

Share based on Transaction Number (IMPORT)

VARIABLES	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect
lnExchange Rate	0.0153 (0.0379)	0.0203 (0.0453)	-0.0009 (0.0440)	-0.0097 (0.0404)	0.0028 (0.0386)	-0.0103 (0.0395)	-0.0036 (0.0343)	-0.0015 (0.0353)	-0.0225 (0.0173)	-0.0091 (0.0234)	-0.0341 (0.0240)	-0.0196 (0.0190)	-0.0188 (0.0196)	-0.0328 (0.0241)	-0.0195 (0.0189)	-0.0218 (0.0215)	-0.0192 (0.0157)	-0.0001 (0.0336)	-0.0016 (0.0371)	0.0292 (0.0371)	0.0236 (0.0347)	0.0239 (0.0345)	0.0231 (0.0372)	0.0240 (0.0357)	0.0220 (0.0352)	0.0191 (0.0316)
Exchange Rate Volatility			-0.2500 (0.197)	-0.3202* (0.160)	-0.3814* (0.198)	-0.2570 (0.158)	-0.1800 (0.143)	-0.3301** (0.146)			0.0452 (0.0614)	0.0153 (0.0669)	0.0356 (0.0663)	0.1402* (0.0786)	0.0143 (0.0755)	-0.00170 (0.0804)	-0.0538 (0.0582)			0.2340 (0.1880)	0.301q** (0.1390)	0.3063** (0.1440)	0.3051* (0.1790)	0.2962** (0.1350)	0.2433* (0.1240)	0.3254** (0.1340)
F.W.Coefficient		-0.00851 (0.0360)								-0.0229 (0.0266)									0.00253 (0.0255)							
Inflation Differential			0.0040 (0.0031)	0.0019 (0.0032)	0.0024 (0.0030)	0.0024 (0.0029)	0.0019 (0.0027)	0.0025 (0.0026)			-0.0016 (0.0014)	-0.0005 (0.0011)	-0.0002 (0.0011)	-0.0005 (0.0010)	-0.0004 (0.0011)	-0.0003 (0.0011)	0.0002 (0.0010)			-0.0039 (0.0028)	-0.0034 (0.0027)	-0.0033 (0.0029)	-0.0033 (0.0028)	-0.0033 (0.0027)	-0.0031 (0.0027)	-0.0034 (0.0025)
lnGDP			-0.00887 (0.0592)								0.0480 (0.0310)									-0.0359 (0.0621)						
lnTotal Import				0.0722** (0.0298)	0.0717** (0.0314)	0.0572** (0.0263)	0.0653** (0.0267)	0.0582** (0.0256)				-0.0375** (0.0174)	-0.0457** (0.0205)	-0.0519** (0.0210)	-0.0371** (0.0175)	-0.0393** (0.0180)	-0.0321* (0.0175)				-0.0300 (0.0190)	-0.0320 (0.0242)	-0.0309 (0.0228)	-0.0299 (0.0193)	-0.0340* (0.0195)	-0.0312 (0.0190)
lnFinancial Openness				0.0783 (0.0661)									-0.0436 (0.0289)									-0.0111 (0.0596)				
FX spread					0.0448 (0.0584)	0.0435 (0.0581)	0.0117 (0.0469)	0.0455 (0.0517)						-0.0391 (0.0266)	-0.0378 (0.0315)	-0.0295 (0.0328)	-0.0121 (0.0182)						-0.0056 (0.0502)	-0.0055 (0.0498)	0.0116 (0.0454)	-0.0036 (0.0451)
Relative Income					-0.0737 (0.0626)									0.0752** (0.0299)									0.0049 (0.0625)			
Share of Intermediate Goods						-0.0785 (0.0917)									0.0305 (0.0436)									0.0117 (0.0617)		
Share of Final Goods							0.377** (0.139)									-0.105 (0.102)									-0.182 (0.124)	
Share of Primary Goods								-0.0900 (0.0751)									0.0183 (0.0169)									0.0778 (0.0678)
Constant	0.353*** (0.082)	0.348*** (0.085)	0.462 (0.378)	-1.974* (1.111)	-1.302 (0.790)	-1.146 (0.776)	-1.550* (0.765)	-1.201 (0.748)	0.166*** (0.038)	0.152*** (0.039)	-0.135 (0.173)	1.209** (0.503)	1.646** (0.699)	1.344** (0.524)	1.185** (0.502)	1.300** (0.531)	1.012* (0.506)	0.500*** (0.072)	0.502*** (0.073)	0.666 (0.411)	1.270** (0.556)	1.382 (0.924)	1.275** (0.587)	1.264** (0.578)	1.452** (0.546)	1.294** (0.550)
Export Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238	238
Number of countries	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Within R-squared	0.046	0.047	0.062	0.112	0.124	0.114	0.229	0.114	0.034	0.043	0.049	0.074	0.085	0.108	0.083	0.101	0.085	0.050	0.050	0.086	0.098	0.099	0.099	0.099	0.153	0.118

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 5: Share based on Value without US Sample (Import)

Share based on Value without US sample (IMPORT)

VARIABLES	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	JPY Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	Local Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect	USD Fixed Effect
lnExchange Rate	0.0128	0.0061	0.0323	0.0213	0.0290	0.0202	0.0228	0.0228	-0.0113	-0.0041	-0.0199	-0.0097	-0.0087	-0.0191	-0.0106	-0.0112	-0.0113	-0.0005	-0.0063	-0.0146	-0.0095	-0.0095	-0.0101	-0.0066	-0.0089	-0.0088
	(0.0343)	(0.0322)	(0.0285)	(0.0266)	(0.0279)	(0.0276)	(0.0287)	(0.0278)	(0.0138)	(0.0164)	(0.0172)	(0.0141)	(0.0145)	(0.0139)	(0.0132)	(0.0130)	(0.0133)	(0.0288)	(0.0285)	(0.0266)	(0.0253)	(0.0253)	(0.0255)	(0.0246)	(0.0240)	(0.0242)
Exchange Rate Volatility			0.0945	0.127	0.0777	0.167	0.188	0.140			0.0489	0.0140	0.0293	0.114*	0.0274	0.0216	0.0339			-0.0810	-0.125	-0.126	-0.130	-0.165	-0.182*	-0.142
			(0.107)	(0.104)	(0.103)	(0.114)	(0.112)	(0.112)			(0.0483)	(0.0467)	(0.0448)	(0.0559)	(0.0531)	(0.0559)	(0.0492)			(0.111)	(0.106)	(0.106)	(0.103)	(0.106)	(0.102)	(0.106)
F.W.Coefficient		0.0114								-0.0122									0.00989							
		(0.0167)								(0.0110)									(0.0129)							
Inflation Differential			0.00162*	0.0010	0.0013	0.0012	0.0010	0.0013			-0.0010	-0.0005	-0.0001	-0.0004	-0.0004	-0.0003	-0.0004			-0.0006	-0.0007	-0.0008	-0.0008	-0.0008	-0.0006	-0.0008
			(0.0010)	(0.0012)	(0.0010)	(0.0010)	(0.0009)	(0.0009)			(0.0008)	(0.0007)	(0.0008)	(0.0007)	(0.0007)	(0.0007)	(0.0007)			(0.0010)	(0.0010)	(0.0011)	(0.0011)	(0.0011)	(0.0010)	(0.0010)
lnGDP			-0.0431								0.0398*									0.0277							
			(0.0355)								(0.0230)									(0.0396)							
lnTotal Import				0.0144	0.0193	0.0091	0.0116	0.0091				-0.0178*	-0.0243**	-0.0271**	-0.0172*	-0.0178*	-0.0172*				0.0121	0.0123	0.00718	0.0112	0.00910	0.0112
				(0.0154)	(0.0161)	(0.0142)	(0.0137)	(0.0143)				(0.0093)	(0.0110)	(0.0114)	(0.0092)	(0.0094)	(0.0093)				(0.0095)	(0.0088)	(0.0088)	(0.0094)	(0.0086)	(0.0095)
lnFinancial Openness				0.0307									-0.0350*									0.00116				
				(0.0240)									(0.0180)									(0.0217)				
FX spread					-0.0093	-0.0105	-0.0205	-0.0089						-0.0409**	-0.0397*	-0.0372*	-0.0401*						0.0445*	0.0450*	0.0534**	0.0434*
					(0.0212)	(0.0195)	(0.0176)	(0.0185)						(0.0171)	(0.0198)	(0.0197)	(0.0197)						(0.0251)	(0.0237)	(0.0243)	(0.0237)
Relative Income					-0.0522									0.0506**									0.0207			
					(0.0320)									(0.0197)									(0.0324)			
Share of Intermediate Goods						-0.0360									0.0085									0.0324		
						(0.0323)									(0.0176)									(0.0317)		
Share of Final Goods							0.123**									-0.0312									-0.106**	
							(0.0543)									(0.0491)									(0.0468)	
Share of Primary Goods								-0.0163									0.0049									0.0120
								(0.0253)									(0.0097)									(0.0185)
Constant	0.275***	0.282***	0.517**	-0.2990	-0.0927	0.0141	-0.1200	-0.0028	0.186***	0.179***	-0.0639	0.679**	1.026**	0.765***	0.662**	0.695**	0.666**	0.503***	0.509***	0.352	0.190	0.178	0.237	0.195	0.310	0.209
	(0.070)	(0.067)	(0.238)	(0.511)	(0.434)	(0.418)	(0.401)	(0.417)	(0.030)	(0.032)	(0.135)	(0.265)	(0.375)	(0.276)	(0.260)	(0.272)	(0.262)	(0.059)	(0.058)	(0.250)	(0.278)	(0.287)	(0.269)	(0.284)	(0.240)	(0.279)
Export Country Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231	231
Number of countries	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Within R-squared	0.0541	0.0601	0.108	0.104	0.139	0.108	0.173	0.0927	0.0208	0.0346	0.0679	0.0683	0.105	0.147	0.0891	0.0978	0.0876	0.0573	0.0632	0.0851	0.0846	0.0846	0.123	0.117	0.177	0.100

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1