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INVOICING OF JAPANESE EXPORTS AND IMPORTS:
ANALYSIS OF GRANULAR DATA BY INDUSTRY AND BY COUNTRY

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ABSTRACT

As a successful competitive research bid to use Japanese customs data, this study calculates the share of trade denomination currency (invoice currency) in Japan's exports and imports by industry and country from individual export and import documents. The results clarify the characteristics of invoice currency choice. The invoice currency share data by industry and country, compiled from customs data, shows each industry's characteristics by country. We confirm that the industry sector of the traded goods plays a role in the choice of invoice currency shares. In addition, we found that invoice currency shares in some industries varied significantly over the sample period from 2014 to 2022. This indicates that heightened geopolitical risks and supply chain restructuring in recent years may affect the choice of invoice currency. We have confirmed a large gap between the average (vs. world) share and the share by individual industry and country. Time-series changes are also remarkable. Our data indicates that the invoice currency shares aggregated in trade with the world do not necessarily reflect changes in invoice currency shares or the actual use of partner country currencies.

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I. Introduction

Previously published data showed that a relatively low share of its exports and imports is invoiced in the yen and a high share of its exports and imports are invoiced in U.S. dollars, and the tendency is rather stable. Regarding the choice of invoice currency by Japanese firms, Shimizu et al. (2021), Ito et al. (2018), Ito et al. (2021), and other studies have shown that although Japan is a developed country, Japanese exporters and importers use more U.S. dollar invoicing and less yen invoicing in trade even with emerging Asian countries. One of the reasons behind this is that the company's headquarters prefer to use the U.S. dollar invoice throughout its supply chain, which involves many overseas subsidiaries in Asia. The headquarters' treasury department collectively manages the foreign exchange risk. However, when Shimizu et al. (2022) analyzed invoice currency shares by trading partner countries using individual customs data from the Ministry of Finance, they confirmed characteristics unavailable in the previously published aggregate data on the invoice currency shares for the entire world or regions. We found that the yen or counterparty currencies are used more often in bilateral trade data and that their shares have increased in recent years. The impression that Japan does not use the yen so much in its trade is, in fact, largely based on the choice of invoice currencies in the U.S., China, and resource-rich countries with large trade volumes. This again suggests the importance of checking transaction data by country to understand the use of Asian currencies such as the Chinese yuan.

In recent years, invoice currency researchers have become increasingly benefited from the publication of broader and more detailed data sets by the authorities. At the IMF, Boz et al. (2022) investigated a database of 115 countries to provide invoice currency share data on trade with the world for each country since 1990. The Boz et al. (2022) study confirmed the reality of the so-called "Dominant Currency Paradigm (DCP)" discussed by Gopinath et al. (2020). The data they collected shows that the U.S. dollar plays a dominant role in world trade. On the other hand, as suggested by Shimizu et al. (2022), the share of invoice currencies in a country's trade with the rest of the world is easily influenced by transactions with countries with large trade volumes. This is the drawback of underestimating the actual use of emerging market currencies such as the Chinese yuan. The European Central Bank (2021), which discusses invoice currency share data for European countries in detail, also reports that the U.S. dollar is the most used currency in Europe's extraterritorial trade, but the euro also serves as the world's second largest international currency after the U.S. dollar.

Data on the share of invoice currency by goods has also been published in recent reports in the EU and the U.K., indicating a high level of attention to the choice of invoice currency

in countries that, like Japan, have international currencies such as the euro and the British pound as their national currencies. The Eurostat classification of goods has only three sub-categories in addition to "All products": "Primary goods excluding Petroleum", "Petroleum", and "Manufactured goods". The report shows that in 2023, the U.S. dollar share of EU countries' extraterritorial trade in crude oil imports will be over 80%, while over 50% of exports of manufactured goods are invoiced in euros¹.

The U.K. has also published a COI_Report_2021 (2023) showing the invoice currency shares by goods in trade between the U.K. and non-EU countries from 2022. According to this report, the U.S. dollar is the most used currency in the U.K.'s imports from non-EU countries, with a 61% share (in 2021), while the British pound is the most used currency in the U.K.'s exports to non-EU countries, but its share is not so dominant at 33%. By goods, SITC's 10 classifications show their respective invoice currency shares, with Crude materials (inedible, except fuels) accounting for a 57.7% share of U.K. exports (2021) in GBP, and Beverages and tobacco and 48.7% for Beverages and tobacco, and for industrial products, the share is close to that in dollars, with the euro also being used for around 20% of these products².

The U.S.-China trade war that has continued since 2019, the spread of the COVID-19 pandemic and supply shortages of intermediate goods such as semiconductors, and the surge in resource prices due to the Russian and Ukrainian crisis since 2022 are likely to cause supply chain restructuring and changes in trade goods in the Japanese manufacturing industry (automotive-related parts will decrease and electronic parts will increase) The trend toward a weaker yen, which has become more pronounced since early 2022, could lead to further structural changes in Japan's exports and imports, including a reshoring of supply chains to the domestic market and increased inward direct investment by foreign manufacturers.

This paper is the second in a series of data studies on invoice currency shares using the granular Japanese customs data. It will show the share of invoice currency in Japanese imports and exports by industry and by country to identify the characteristics of such choices. The intention of focusing on the invoice currency share by industry is twofold. First, as Ito et al. (2012, 2018) pointed out, intra-firm trade is likely to adopt Pricing-to-Market (PTM) behavior that does not expose local subsidiaries to exchange rate risk in exports from the Japanese headquarters to overseas subsidiaries and stabilizes export prices in terms of the partner countries' currency. In addition, PTM behavior may also induce the use of a partner currency-invoiced export price that will make the local sales price stable in the partner country. PTM behavior also consists of the following factors: exporting in the partner country's

¹ See Appendix 1 for more information.

² See Appendix 2 for more information.

currency to prevent sales prices from being affected by exchange rate fluctuations when competition in the partner country's market is fierce, and adopting a PTM strategy to maintain market share because the partner firm is an important customer for the firm. From the invoice currency share by industry, we can determine the characteristics of each industry sector. Second, McKinnon's (1979) hypothesis regarding the choice of invoice currency is that "Exports of differentiated goods are traded in the currency of the exporting country (in this paper, yen). Homogeneous goods such as crude oil are traded in the vehicle currency (U.S. dollar)." Using Japanese customs data, we can test McKinnon's hypothesis using invoice currency shares by industry.

In terms of invoice currency choice, the country-by-country invoice currency share data compiled from customs data by Shimizu et al. (2022) shows that each country has its characteristics, but it is significant to show how the industry sector of traded goods, in addition to the characteristics of trading partners, affects the choice of invoice currency. It is also significant to demonstrate how the choice of invoice currency is affected not only by the characteristics of trading partners but also by the industry sector of the traded goods to predict how the choice of invoice currency will change in the future as the industry composition of Japan's exports and imports changes.

The rest of this paper is organized as follows. Section 2 reviews the evolution of the share of each industry sector in exports and imports. Section 3 summarizes the characteristics of the invoice currency share of each trading partner country for the industries of interest. Section 4 provides a summary and discusses future issues.

2. Invoice Currency Choice by Industry for Exports and Imports

2-1. Creation of Data by Industry

In Japan's trade statistics, items are recorded by nine-digit statistical numbers, and the statistical tables compiled by statistical numbers are called "Statistical Tables by Commodity" or "Commodity Tables". For example, the table of countries by product published by the Ministry of Finance indicates which countries and the amount of trade (exports or imports) are conducted with each statistical number. However, it is not realistic to calculate the invoice currency share for each item classified by a 9-digit HS code because the number of items would be too large, and the number of customers would be too small to quickly identify individual information, which would effectively lead to the disclosure of such personal information. Even in the release of trade statistics, from the perspective of protecting the information of companies and individuals, measures are taken to ensure that specific personal information is not substantially compromised its

confidentiality. In addition to “Commodity”, “Principal Commodity,” which means the item grouped with the same kinds/types of several 9-digit commodities, is used in publications of the Trade Statistics to grasp the outline of trade of main commodities. Therefore, in this paper, we define “main commodities” as a type of industry, and analyze invoice currency selection by industry. For information on what statistical numbers each of the main commodities are grouped under, please refer to the correspondence table in Appendix 3, the Main Commodities’ Product Code - HS Code Converter as of April 2022

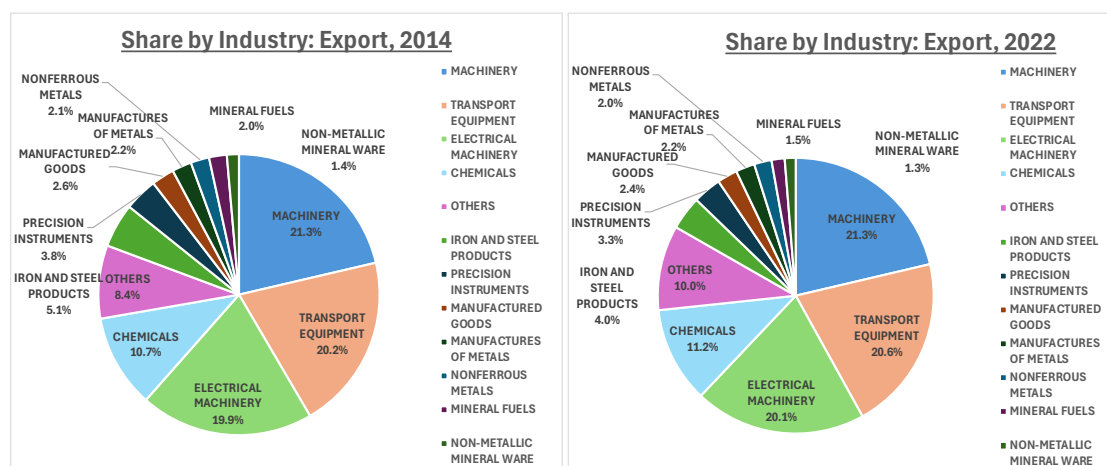
The HS codes are revised once or twice a year due to HS revisions, etc. The HS codes and converters are changed based on the “date of export declaration” for export declarations and the “date of application for declaration” for import declarations. In this study, HS codes and converters for general merchandise are changed based on the “date of export declaration” for export declarations and the “date of application for declaration” for import declarations.

In this paper, we further compiled the aforementioned general merchandise codes to correspond to the major commodities used in the publication of trade statistics. We broadly categorized both imports and exports into 12 commodities (including others). These were then used to calculate annual invoice currency shares for the sample period from 2014 to 2022, by industry.

Graphs 1 and 2 show the shares of all export and import values broken down by the industries mentioned above³. First, in 2022, machinery (21.3%), transport equipment (20.6%), electrical machinery (20.1%), and chemicals (11.2%) ranked first, second, third, and fourth, respectively, in terms of the share of exports by industry sector. The top four industries account for approximately 70% of the total.

³ In this paper, the calculation of industry share is based on the customs declaration data. When classifying by industry and country, the data for items with a small number of objects are missing due to confidentiality obligations, so the figures do not exactly match the figures obtained from the data in the monthly trade statistics published by the Ministry of Finance.

Graph 1: Export Shares of Major Industries based on Product Codes (2014 and 2022)

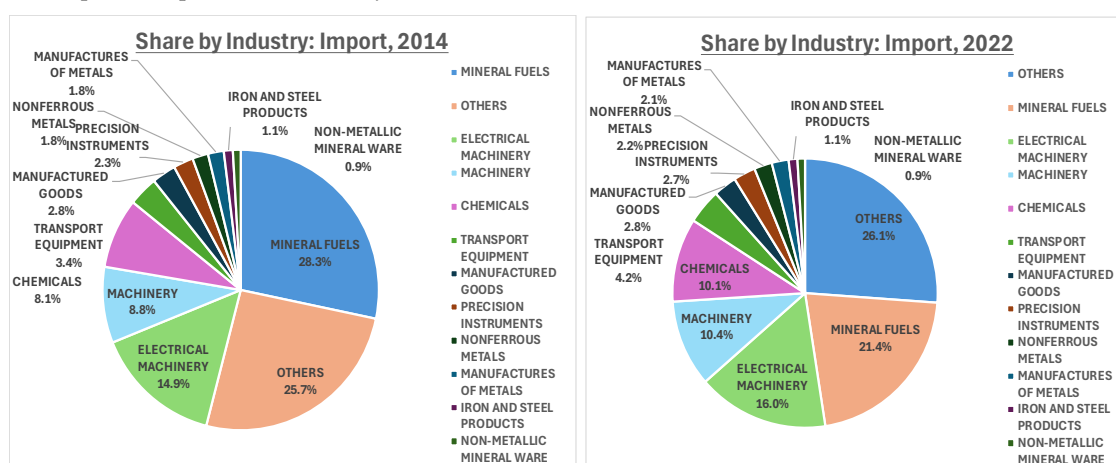


Source: Author's calculations based on customs data.

Note: “Manufactured Goods” here refers to products by raw material in principal commodity code excluding “Non-Metallic Mineral Ware”, “Iron and Steel Products”, “Nonferrous Metals”, and “Manufactures of Metals”.

The 2022 percentages of imports by industry are: unclassified (26.1%), mineral fuels (21.4%), electrical equipment (16.0%), general machinery (10.4%), and chemical products (10.1%). The order of the first and second places is opposite compared to 2014, but there is not much change in the other categories. The top five industries, including unclassified, account for approximately 85%.

Graph 2: Import Share of Major Industries based on Product Codes (2014 and 2022)



Source: Author's calculations based on customs data.

Note: “Manufactured Goods” here refers to products by raw material in principal commodity code excluding “Non-Metallic Mineral Ware”, “Iron and Steel Products”, “Nonferrous Metals”, and “Manufactures of Metals”.

2-2. Invoice currency share by industry

In this paper, we have calculated invoice currency shares for the 12 industries. First, Table 1 summarizes the results of their respective shares in exports to and imports from the world in 2022.

The industries with the highest yen-invoiced share of exports in 2022, excluding unclassified, are machinery (46.8%), followed by non-metallic mineral products (44.9%) and metal products (44.5%). The industries with the highest dollar share are those close to raw materials, such as mineral fuels (91.7%), steel (83.3%), and nonferrous metals (75.7%). The manufacturing industries with the highest U.S. dollar-invoiced shares are electrical machinery (57.8%), chemicals (55.7%), and transport equipment (52.6%), with U.S. dollar-invoiced shares exceeding 50%, but all have seen their shares decline compared to 2014. +The highest share in the partner currency (excluding U.S. dollar-invoiced shipments to the U.S.) is in transport equipment (19.7%), followed by precision instruments (17.8%). The most noticeable change compared to 2014 is in precision equipment, where the share in dollars has decreased by 15.3%, replaced by an increase in the share in yen (+6.6%) and in local currency (+8.9%), respectively.

On the other hand, the highest yen-invoiced shares of imports in 2022 are transport equipment (54.4%), steel (51.7%), and chemicals (50.5%), while the shares of the two industries, excluding iron and steel, have increased compared to 2014. In descending order of U.S. dollar share, nonferrous metals (92.6%), mineral fuels (80.5%), electrical equipment (74.0%), raw material products (62.4%), and general machinery (61.4%). The high share of dollar-invoiced imports in these industries with large import values is the reason why Japan is said to import mainly in dollars. Compared to 2014, the dollar invoiced share has decreased by 5.7% for precision instruments, 4.7% for chemical products, and 3.7% for mineral fuels, instead increasing mainly in yen. Precision instruments (15.0%), followed by metal products (13.4%), and transport equipment (13.0%) have the highest shares in local currency invoicing (except U.S. dollar invoicing in trade with the U.S.). Precision instruments also show changes in imports, although not as pronounced as exports, with a 5.7% drop in the U.S. dollar-invoiced share, replaced by a 3.7% and 1.8% increase in the yen-invoiced and local-currency-invoiced shares, respectively.

Table 1. Invoice Currency Share of Exports and Imports to the World by Industry, 2022

Industry	Invoice Currency	Export		Import	
MACHINERY	Yen	46.8%	(▲2.7%)	25.8%	(▲1.9%)
	Partner's Currency	12.2%	(+3.0%)	11.5%	(+1.1%)
	Others	1.7%	(▲0.5%)	1.2%	(▲0.3%)
	U.S. dollar	39.3%	(+0.2%)	61.4%	(+1.1%)
CHEMICALS	Yen	32.7%	(+0.8%)	50.5%	(+4.0%)
	Partner's Currency	10.8%	(+4.6%)	5.8%	(▲0.5%)
	Others	0.9%	(+0.2%)	2.8%	(+1.1%)
	U.S. dollar	55.7%	(▲5.7%)	40.9%	(▲4.7%)
MANUFACTURES OF METALS	Yen	44.5%	(▲0.7%)	40.3%	(▲3.5%)
	Partner's Currency	12.7%	(+4.0%)	13.4%	(+3.1%)
	Others	2.2%	(▲0.1%)	1.0%	(▲0.2%)
	U.S. dollar	40.6%	(▲3.2%)	45.3%	(+0.6%)
MANUFACTURED GOODS	Yen	32.4%	(▲2.3%)	29.3%	(▲1.4%)
	Partner's Currency	14.5%	(+0.7%)	7.5%	(+1.5%)
	Others	2.0%	(+0.9%)	0.8%	(▲0.0%)
	U.S. dollar	51.1%	(+0.7%)	62.4%	(▲0.1%)
MINERAL FUELS	Yen	8.1%	(▲0.4%)	19.5%	(+3.7%)
	Partner's Currency	0.2%	(+0.1%)	0.0%	(+0.0%)
	Others	0.0%	(+0.0%)	0.0%	(▲0.0%)
	U.S. dollar	91.7%	(+0.3%)	80.5%	(▲3.7%)
PRECISION INSTRUMENTS	Yen	37.9%	(+6.6%)	47.7%	(+3.7%)
	Partner's Currency	17.8%	(+8.9%)	15.0%	(+1.8%)
	Others	1.0%	(▲0.3%)	2.0%	(+0.2%)
	U.S. dollar	43.2%	(▲15.3%)	35.3%	(▲5.7%)
IRON AND STEEL PRODUCTS	Yen	13.8%	(+3.2%)	51.7%	(▲2.2%)
	Partner's Currency	2.5%	(+1.1%)	3.8%	(+2.0%)
	Others	0.4%	(+0.3%)	0.2%	(+0.0%)
	U.S. dollar	83.3%	(▲4.6%)	44.3%	(+0.2%)
ELECTRICAL MACHINERY	Yen	29.6%	(▲1.0%)	20.3%	(▲4.4%)
	Partner's Currency	11.1%	(+2.5%)	5.0%	(+1.0%)
	Others	1.5%	(+0.3%)	0.7%	(▲1.0%)
	U.S. dollar	57.8%	(▲1.8%)	74.0%	(+4.3%)
NON-METALLIC MINERAL WARE	Yen	44.9%	(▲5.9%)	30.7%	(▲5.8%)
	Partner's Currency	10.0%	(+3.1%)	11.6%	(+3.7%)
	Others	0.8%	(+0.1%)	0.8%	(▲0.3%)
	U.S. dollar	44.3%	(+2.7%)	56.9%	(+2.4%)
NONFERROUS METALS	Yen	21.9%	(▲0.6%)	5.4%	(▲1.8%)
	Partner's Currency	2.4%	(+0.8%)	1.9%	(+0.6%)
	Others	0.0%	(▲0.1%)	0.1%	(▲0.1%)
	U.S. dollar	75.7%	(▲0.2%)	92.6%	(+1.2%)
OTHERS	Yen	49.2%	(+4.4%)	32.5%	(+1.7%)
	Partner's Currency	8.8%	(▲1.1%)	6.0%	(▲0.5%)
	Others	1.0%	(▲0.3%)	1.1%	(+0.1%)
	U.S. dollar	41.0%	(▲3.0%)	60.4%	(▲1.4%)
TRANSPORT EQUIPMENT	Yen	25.7%	(▲2.1%)	54.4%	(+5.6%)
	Partner's Currency	19.7%	(+3.4%)	13.0%	(▲2.7%)
	Others	2.0%	(+0.1%)	1.0%	(▲3.9%)
	U.S. dollar	52.6%	(▲1.4%)	31.5%	(+0.9%)

Source: Author's calculations based on customs data.

Note1: “Manufactured Goods” here refers to products by raw material in principal commodity code, excluding “Non-Metallic Mineral Ware”, “Iron and Steel Products”, “Nonferrous Metals”, and “Manufactures of Metals”.

Note2: Figures in parentheses represent the difference from the invoice currency share in 2014; ▲ indicates

a decrease in invoice currency share.

3. Characteristics of Invoice Currency Share by Industry and by Country

The following table shows the characteristics of the invoice currency share of the six major industries with high shares of exports and imports (excluding unclassified industries) for each of the top 10 trading partner countries. Let us summarize the characteristics of the transition from 2014 to 2022.

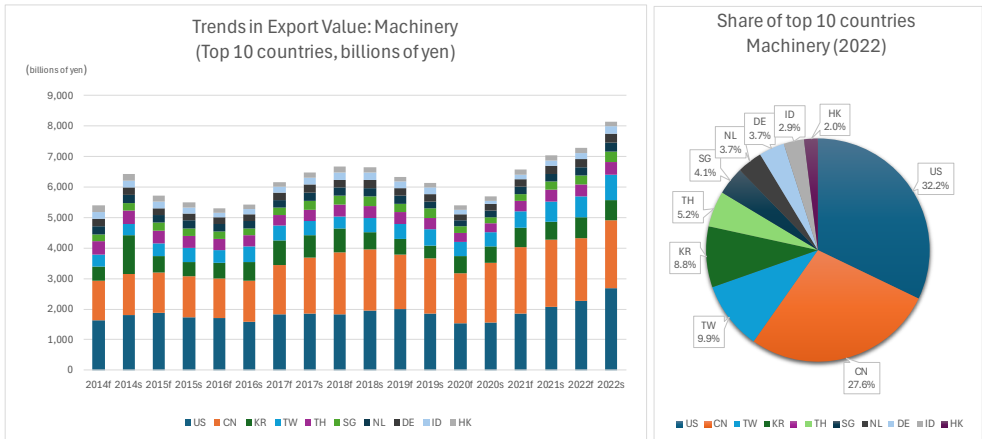
3-1. Export

The following table shows the invoice currency share (yen-invoiced, U.S. dollar-invoiced, and partner countries' local currency-invoiced (excluding U.S. dollar-invoiced exports to the U.S.)) by country for the top 10 trading partner countries in the machinery, transport equipment, electrical machinery, steel, chemicals, and precision instruments industries handled in exports.

Machinery

Graph 3 shows the export value and share (in 2022) of the top 10 countries in machinery. After declining in the first half of 2020 during the COVID-19 pandemic, exports have been growing steadily. The top two countries, the U.S. and China accounted for almost 60% of exports in 2022, with no significant changes in this situation.

Graph 3: Export Value and Share in the top 10 Countries (Machinery, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

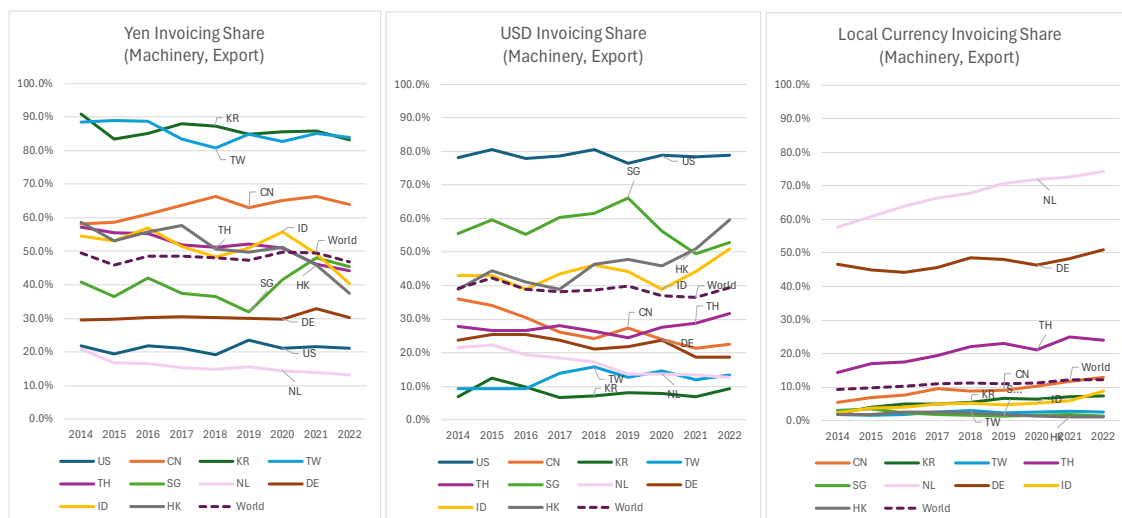
Source: Author's calculations based on customs data.

The top 10 export partners for machinery are the United States, China, Taiwan, South Korea, Thailand, Singapore, the Netherlands, Germany, Indonesia, and Hong Kong. The yen-invoiced share of global exports is generally just under 50%, while the U.S. dollar share is hovering around 40%. The local currency share is trending slightly upward from less than 10% to the 10% range, but there is a marked difference compared to the respective world shares by country.

Exports to South Korea and Taiwan have the highest yen-invoiced share, hovering in the 80% range. Exports to China were less than 60% in 2014. However, the yen-invoiced share is on a gradual upward trend, reaching 63.9% in 2022. Similarly, for exports to Singapore, the share of yen-invoiced exports has risen rapidly since 2020, reaching 45.3% in 2022. On the other hand, the share of yen-invoiced exports to Indonesia and Hong Kong is declining, and the situation of yen-invoiced exports to Asia differs even within the same region. Exports to Germany and the U.S. show little change, and those to the Netherlands are also in a gradual downtrend, with yen-invoiced shares lower than their global shares.

The largest share in U.S. dollars is for the U.S., at around 80%, with no change. The share in U.S. dollars is increasing for Hong Kong and Indonesia, which is expected to be over 50% in 2022. The share in U.S. dollars is declining for China, Germany, and the Netherlands. On the other hand, the Netherlands has the highest share in local currency, which has risen since 2014, reaching 74.2% in 2022. The share for Germany also exceeded 50% in 2022. Thailand's share in local currency is growing in Asia, reaching 24% in 2022. The share for Indonesia is expected to be 8.8% in 2022, nearly four times that of 2014.

Graph 4: Invoice Currency Share in the top 10 Countries (Machinery, %)

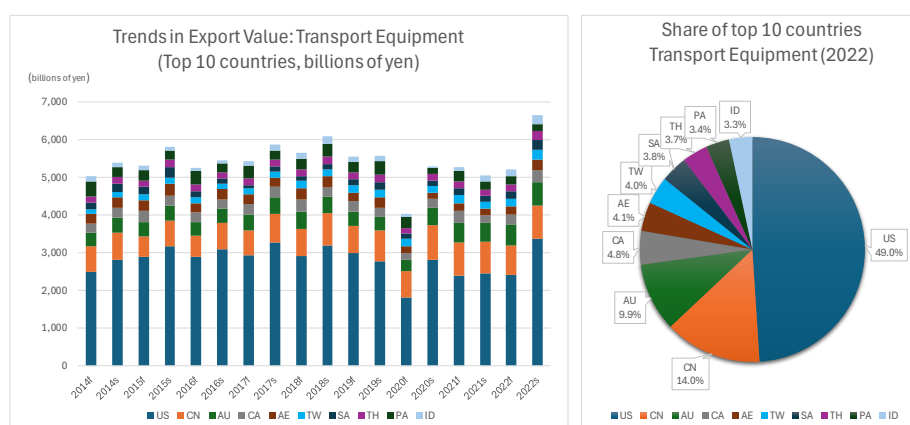


Source: Author's calculations based on customs data.

Transport Equipment

Graph 5 shows trends in export value and share (as of 2022) of the top 10 countries in transport equipment. Export value was sluggish after declining in the first half of 2020 during the COVID-19 pandemic period, but recovered in the second half of 2022. The U.S., with the top share as of 2022, accounts for almost 50% of the total. In recent years, the value of exports to Australia and the Middle East has increased.

Graph 5: Share of Export Value in the top 10 Countries (Transport Equipment, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

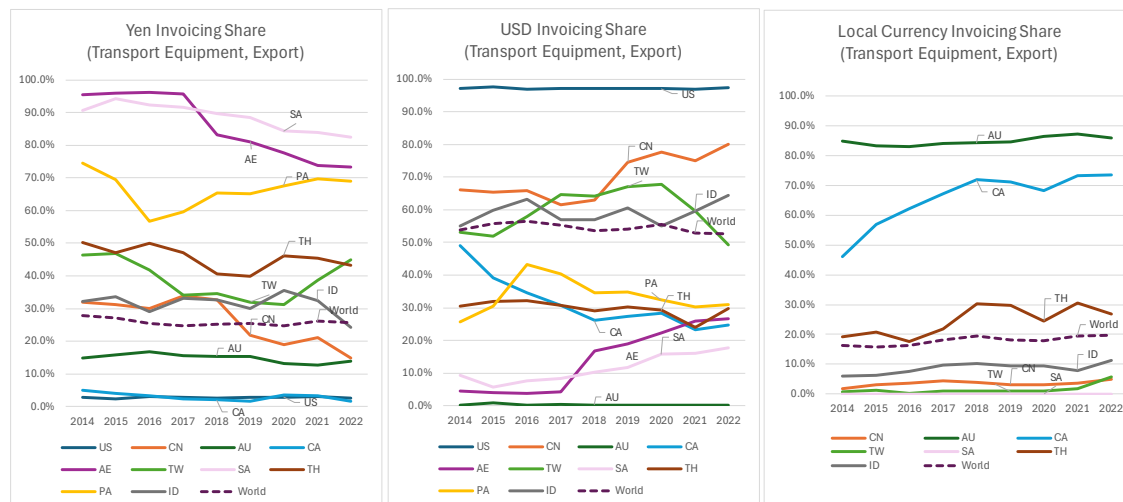
The top 10 exporting countries for transport equipment are the United States, China, Australia, Canada, the United Arab Emirates, Taiwan, Saudi Arabia, Thailand, Panama, and Indonesia. The yen-invoiced share of exports to the world is generally in the 20% range, while the U.S. dollar share is hovering in the 50% range, with little change. The share of local currency-invoiced exports falls within the latter half of the 10% range, with a slight upward trend. However, the difference between the respective world shares by country is significant.

The Middle Eastern countries with the highest yen-invoiced shares are Saudi Arabia and the UAE, whose shares were in the 90% range in 2014 but have been declining since 2018, reaching 82.4% and 73.3%, respectively, in 2022. The yen-invoiced share of exports to Panama has also returned to around 70%, although it had dropped temporarily. In Asia, exports to Thailand and Taiwan fluctuated up and down but returned in the 40% range by 2022. On the other hand, the yen-invoiced share of exports to China and Indonesia is declining, while the dollar-invoiced share is growing. The yen-invoiced share of exports to the U.S. and Canada is extremely low, at less than 5%.

The highest share in dollars is to the U.S., where it is almost 100%, with no change. The next highest share in dollars is for exports to China, where the share is increasing and is expected to be in the 80% range by 2022. Similarly, in exports to Indonesia, the dollar-invoiced share has risen to the 60% level, while in exports to Taiwan, the dollar-invoiced share, which had been growing since 2014, has declined since 2021 to less than 50%. In exports to the Middle East, the share of yen-invoiced transactions has declined, while the share of dollar-invoicing has grown instead.

The highest share in local currency is to Australia, which has remained unchanged at 80% since 2014. For exports to Canada, the share has been on the rise since 2014, reaching 73.6% in 2022. Exports to Thailand have also risen from less than 20% to around 30%. Exports to Indonesia, China, and Taiwan are also gradually increasing in local currency invoicing but are still relatively low, at around 10% in exports to Indonesia.

Graph 6: Invoice Currency Share of Top 10 Countries (Transport Equipment, %)

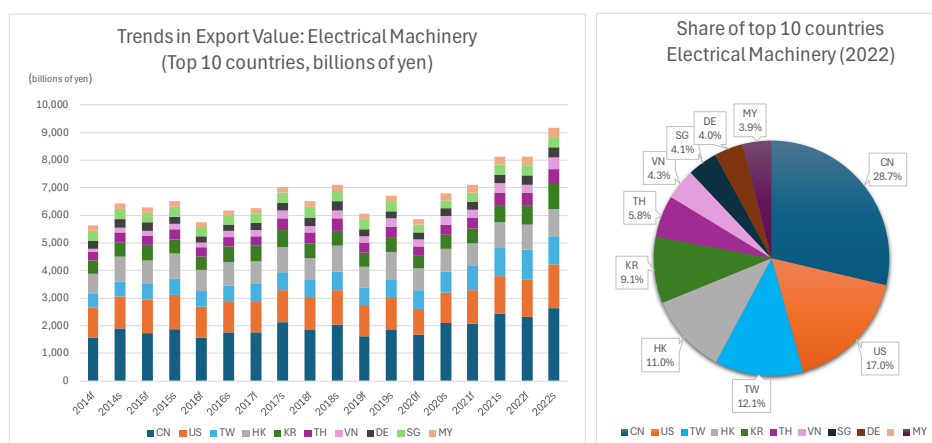


Source: Author's calculations based on customs data.

Electrical Machinery

Graph 7 shows the export value trends and market shares (in 2022) of the top 10 countries in electrical machinery. Export value has been growing steadily after declining in the first half of 2020 during the COVID-19 pandemic period. In the second half of 2022, exports of Electrical Machinery are the largest since 2014. It recovered sharply in the second half of 2022, with nearly 30% of the top share going to China and almost 80% to the United States, Taiwan, Hong Kong, and South Korea, the second to fifth largest countries combined.

Graph 7: Share of Export Value in the top 10 Countries (Electrical Machinery, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

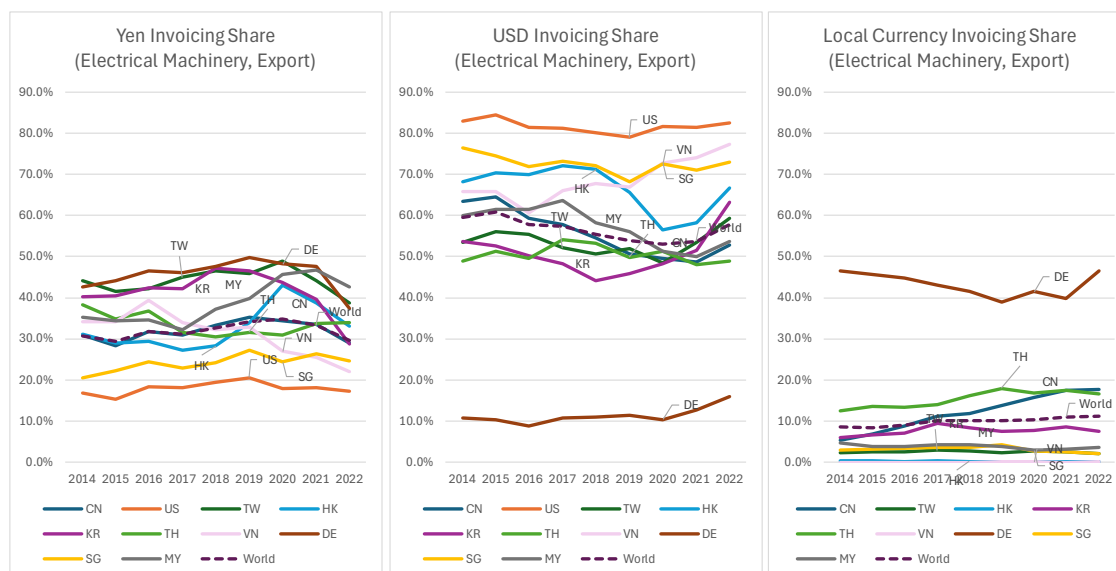
The top 10 exporting countries for electrical machinery are China, the U.S., Taiwan, Hong Kong, South Korea, Thailand, Vietnam, Singapore, Germany, and Malaysia. The yen-invoiced share of exports to the rest of the world is generally around 30%, while the U.S. dollar share is in the 50% range. The local currency share is small but increasing, reaching 11.1% in 2022. Variations in global share by country are insignificant except for exports to Germany.

The yen-invoiced share of exports to Germany, Taiwan, Malaysia, Hong Kong and Thailand is higher than the share to the rest of the world but has been declining sharply since 2021. Similarly, exports to South Korea and Vietnam have declined sharply recently.

The largest share in dollar terms is to the U.S., at around 80%, with no change. The next highest share is for Vietnam and Singapore, which are in the 70% range. Other Asian countries that have seen their yen-invoiced shares plummet have instead seen their dollar-invoiced shares increase. Among the top 10 countries, Germany is the only one with a U.S. dollar share in the 10% range.

The highest share in local currency is for Germany, which has declined since 2014, but is back to around 45% in 2022. For Asia, the share of Thailand and China has continued to rise since 2014, reaching 16.5% and 17.8%, respectively, in 2022.

Graph 8. Invoice Currency Share in the top 10 Countries (Electrical Machinery, %)

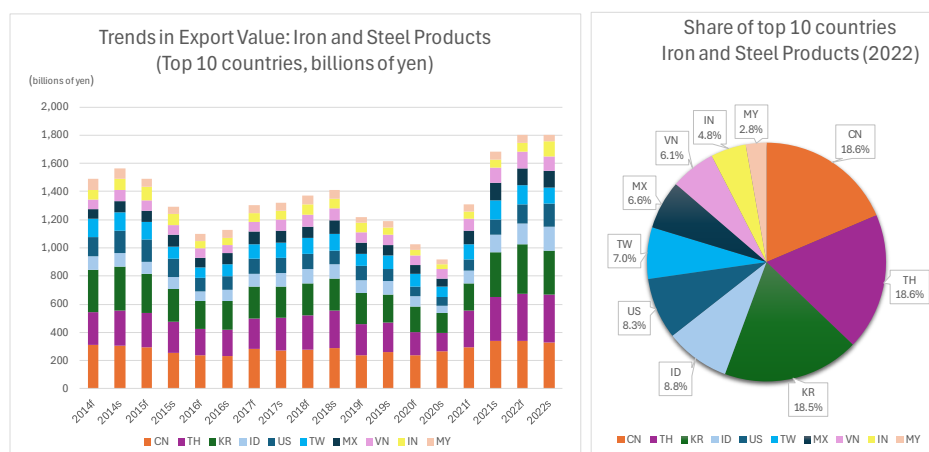


Source: Author's calculations based on customs data.

Iron and Steel Products

Graph 9 shows the export value and share (in 2022) of the top 10 countries in iron and steel products. Exports are recovering rapidly after declining in the first half of 2020 during the COVID-19 pandemic period, with the top three countries--China, Thailand, and South Korea-- having roughly the same share of 18% in 2022.

Graph 9: Share of Export Value in the top 10 Countries (Iron and Steel products, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

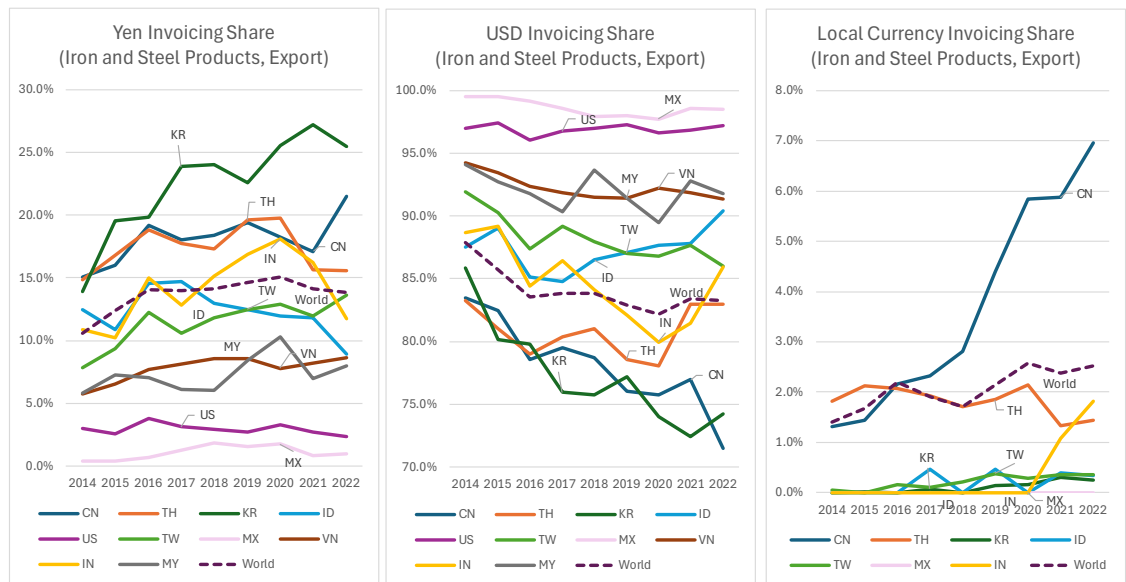
The top 10 steel export partners are China, Thailand, South Korea, Indonesia, the U.S., Taiwan, Mexico, Vietnam, India, and Malaysia. The yen-invoiced share of exports to the world is less than 15%, although it is on a gradual upward trend, while the U.S. dollar share is in the high 80% range, although it is declining slightly. Local currency-invoiced exports are almost negligible at less than 3%. There is little change in exports to North America by country, but changes are observed in some exports to Asia.

The highest yen-invoiced share is in exports to South Korea, rising from 13.9% in 2014 to 25.5% in 2022. Similarly, the share for exports to China was in the 20% range in 2022. On the other hand, exports to Thailand, India, and Indonesia have declined since 2021, indicating changes in recent years in Asian countries.

The highest dollar shares are for Mexico and the U.S., which remain above 95%. The dollar-invoiced share is declining markedly for South Korea and China, from around 85% in 2014 to 74.2% and 71.5%, respectively, in 2022. On the other hand, in other Asian countries, where the yen-invoiced share has plummeted, the dollar-invoiced share is rising, indicating

that differences are emerging even among Asian destinations. The share of exports to China in local currency is growing rapidly, from 1.3% in 2014 to 7% in 2022.

Graph 10. Invoice Currency Share in the top 10 Countries (Iron and Steel Products, %)

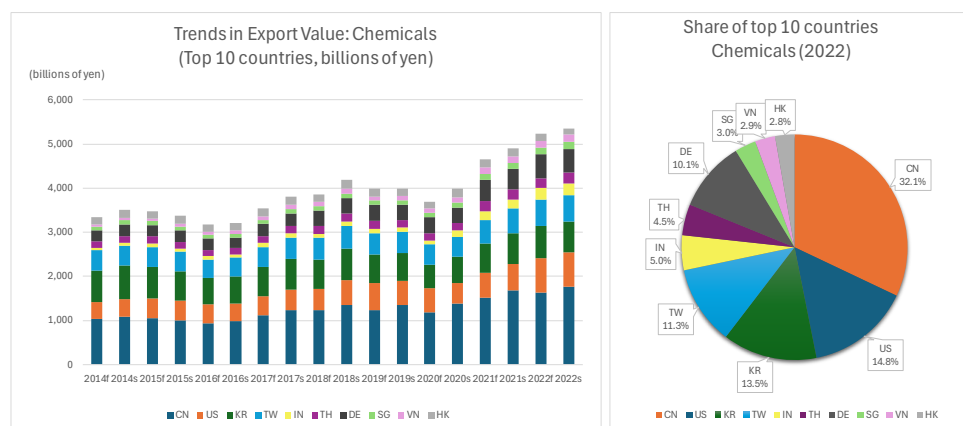


Source: Author's calculations based on customs data.

Chemicals

Graph 11 shows the trends in export value and share (as of 2022) of the top 10 countries in chemicals. The export value is growing steadily after a slight decline in the first half of 2020 during the COVID-19 pandemic period. As of 2022, China holds the largest share, accounting for more than 30%.

Graph 11: Share of Export Value in the top 10 Countries (Chemicals, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

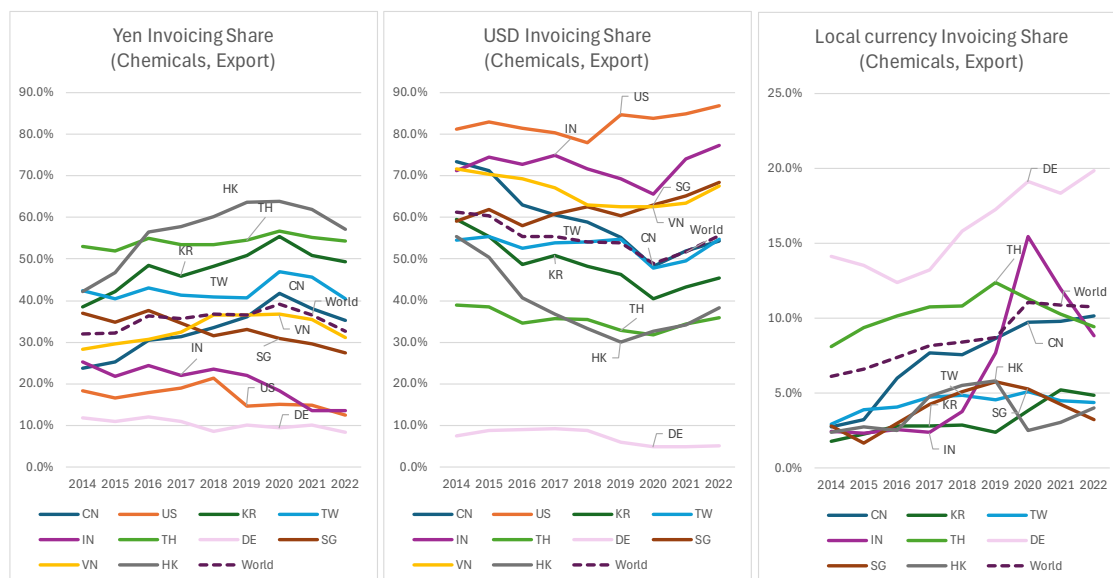
The top 10 export partners for chemicals are China, the U.S., South Korea, Taiwan, India, Thailand, Germany, Singapore, Vietnam, and Hong Kong. The yen-invoiced share of global exports to these countries is generally in the 30% range, while the U.S. dollar share drops from the 60% level to below 50% but rebounded to reach 55.7% in 2022. The local currency share, although small, is on an upward trend and will be in the 10% range from 2020 onward. By country, there is a reasonable difference from the respective global shares.

The yen-invoiced share is higher than the world share for exports to Hong Kong, Thailand, South Korea, Taiwan, and China, with the highest share being to Hong Kong, which rises to 60% and then hovers around 50%. Similarly, exports to South Korea increased from 40% to 50% before hovering around 60%. The share for Thailand has remained stable at the 50% level. The share for China is 35.3% in 2022, after rising from 23.7% in 2014 to 40%. On the other hand, the yen-invoiced share is declining for exports to Singapore, India, and the United States. For exports to Germany, it is as low as around 10%.

The largest share, in dollar terms, is held by the U.S., where the share is generally in the 80% range. The next highest share is for India, around 70%, followed by Singapore and Vietnam, where the share is in the 60% range. The yen invoiced share has been increasing in both South Korea and Hong Kong, but is currently on a downward trend.

Exports to Germany, which have the highest share in local currency, have been on an upward trend since 2014, reaching 19.9% in 2022. Similarly, exports to China rose from 2.7% in 2014 to 10.1% in 2022. On the other hand, exports to India, which were low at 2.4% in 2014, rose to 15.5% in 2020 but are falling sharply to 8.8% in 2022.

Graph 12: Invoice Currency Share in the top 10 Countries (Chemicals, %)

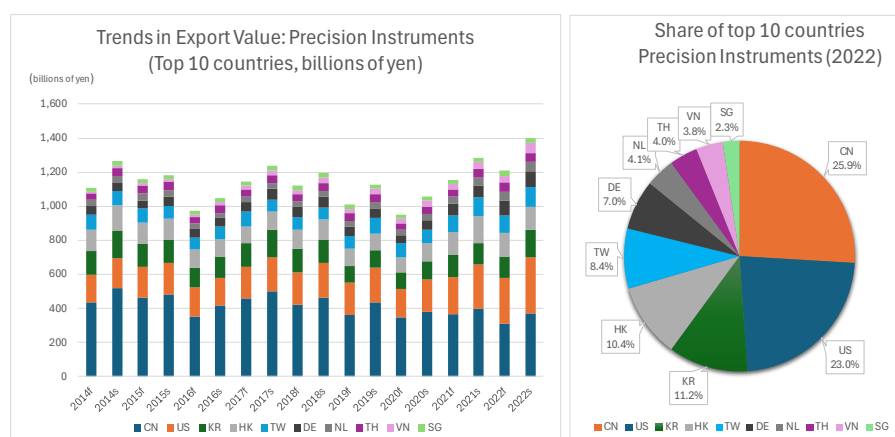


Source: Author's calculations based on customs data.

Precision Instruments

Graph 13 shows the export value trends and shares (in 2022) of the top 10 countries in the precision instruments category. The export value fluctuates sharply, regardless of the COVID-19 pandemic period. However, the value of exports in the second half of 2022 is the largest; as of 2022, the top share, China, and the second largest, the U.S., account for almost 50% of the total.

Graph 13: Share of Export Value in the top 10 Countries (Precision Instruments, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

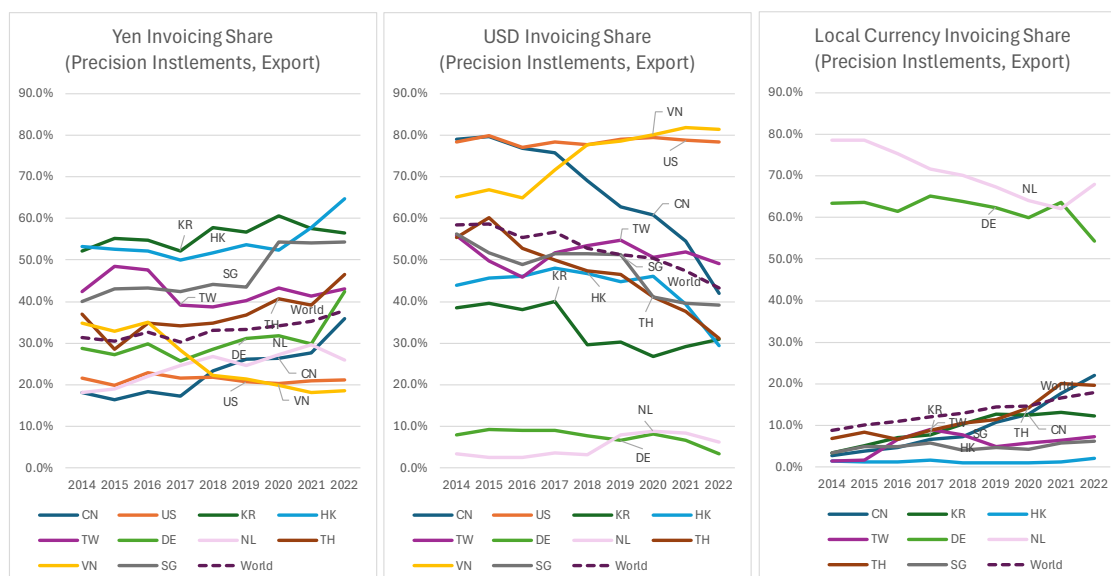
The top 10 export partners for precision instruments are China, the U.S., South Korea, Hong Kong, Taiwan, Germany, the Netherlands, Thailand, Vietnam, and Singapore. The yen-invoiced share of global exports to the world is in the 30% range and rising, while the U.S. dollar share has declined from the 50% range to the 40% range. The local currency share has risen from less than 10% to 17.8% in 2022. The difference from the global share is more pronounced in countries in Europe and the rest of the world.

The highest yen-invoiced share was to South Korea, which remained in the 50% range and was overtaken by Hong Kong, which rose sharply in 2021. The share of Singapore also rose after 2019 to the 50% level. For exports to China, the share was up from 18.2% in 2014 to 35.9% in 2022. Similarly, exports to Thailand and Germany are on the rise, while those to Vietnam are on the decline, falling from 34.8% in 2014 to 18.5% in 2022.

The highest U.S. dollar share is held by Vietnam, where the share to the U.S., currently hovering around 80%, is expected to surpass that of the U.S. by 2020, reaching 81.4% by 2022. On the other hand, exports to China, which accounted for around 80% in 2014, have since declined significantly to 41.9% in 2022. Similarly, the declining trend is evident for exports to Thailand, Hong Kong, and South Korea, confirming that the choice of invoice currency has changed in recent years for precision instruments exports to Asia.

On the other hand, the Netherlands has the largest share in local currency, but this share has declined since 2014, from nearly 80% to 67.9% in 2022. Germany's share was also expected to fall below 60% by 2022. The share for Asia is on the rise for all countries, especially for China, rising from 2.7% in 2014 to 22.0% in 2022. Similarly, Thailand's share in local currency went from 6.8% in 2014 to 19.6% in 2022.

Graph 14: Invoice Currency Share in the top 10 Countries (Precision Instruments, %)



Source: Author's calculations based on customs data.

In summary, we have confirmed that the share of exports by industry and country in the invoice currency is changing, with each country exhibiting its own characteristics. Even in China, where the share of exports invoiced in the local currency has increased in recent years, the changes vary by industry sector. In the transport equipment sector, the dollar-invoiced share has been growing, but in other industries, the dollar-invoiced share has declined, while the local currency and yen-invoiced shares have increased. In particular, the dollar-invoiced share in precision instruments fell by nearly 40% between 2014 and 2022, while the yuan-invoiced share and the yen-invoiced share grew by around 20%. The impact of the U.S.-China trade war over semiconductors that began in 2018 and beyond has also confirmed that China has significantly reduced the U.S. dollar invoicing when importing precision instruments from Japan. The share of dollar-invoiced imports of precision instruments from Japan was also confirmed to have dropped markedly. The report also showed that the yen-invoiced share of transport equipment exports to Middle Eastern countries, which had previously been high, has declined while the dollar-invoiced share has increased.

3-2. Imports

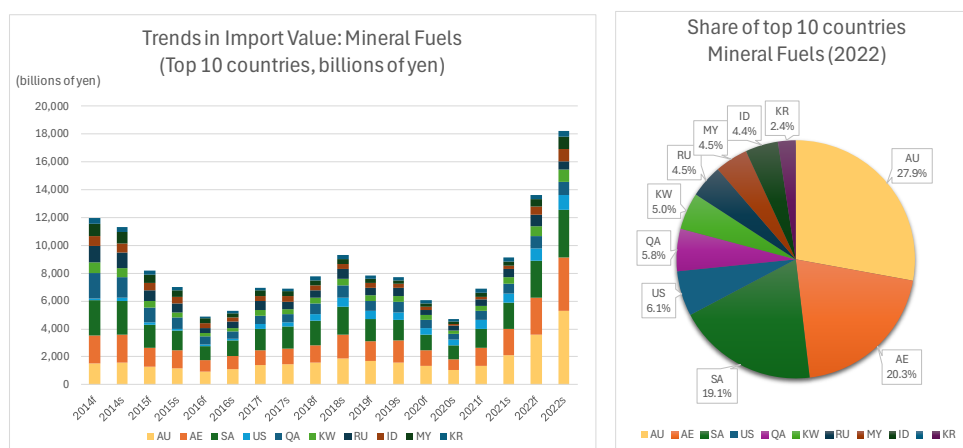
Imports handle mineral fuels, electrical machinery, chemicals, machinery, transport equipment, and precision instruments and equipment (excluding unclassified and raw material products). The following table calculates the invoice currency share of each industry

by country for each of the top 10 trading partners (invoiced in yen, U.S. dollars, and local currency (excluding U.S. dollar-invoiced goods bound for the U.S.)). It looks at the trends in these shares.

Mineral fuels

Graph 15 shows the trends in import value and share (as of 2022) of the top 10 countries in mineral fuels. Fluctuations in the value of imports have been strong in line with the rise and fall of resource prices. In 2022, the imports increased in line with the surge in resource prices. The top share as of 2022 is almost 30% from Australia and nearly 40% from the two Middle Eastern countries in second and third place.

Graph 15: Share of imports in the top 10 countries (mineral fuels, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

The top 10 import partners for mineral fuels are Australia, the United Arab Emirates (UAE), Saudi Arabia, the United States, Qatar, Kuwait, Russia, Malaysia, Indonesia, and South Korea. The yen-invoiced share of global imports to the world has remained at just under 20%. In comparison, the dollar-invoiced share has remained at just over 80%, with no significant changes, but the difference from the global share by country is substantial and highly variable.

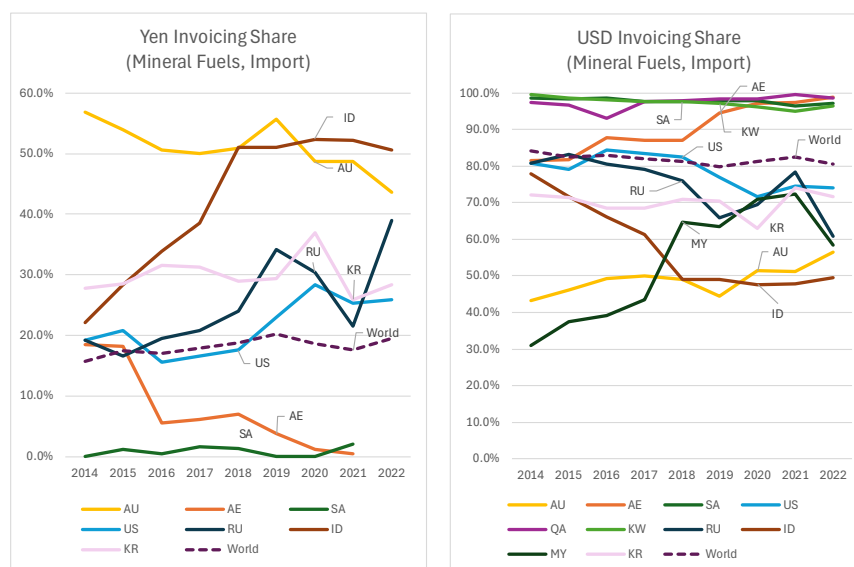
The highest yen-invoiced share was 56.8% for Australia at the beginning of 2014 but has declined in recent years, reaching 43.6% in 2022. On the other hand, Indonesia had a 22.1% share in 2014, which rose sharply by 2018, reaching a 50% yen-invoiced share. Similarly, the yen-invoiced share of imports from Russia has also seen a recent surge, from less than 20% to as high

as 38.9% by 2022. For imports from the U.S., the yen-invoiced share has also grown slightly, reaching 25.9% in 2022. On the other hand, for imports from the UAE, the yen-invoiced share has declined from 18.4% in 2014 to almost zero in 2022.

Regarding the dollar share, almost 100% of imports from Middle Eastern countries are invoiced in U.S. dollars. For imports from Australia, where the yen-invoiced share has declined, the dollar-invoiced share has increased, reaching 56.4% in 2022. For imports from countries where the yen-invoiced share has increased, the dollar-invoiced share has generally declined.

For mineral fuels from Russia, the report shows a gradual increase in yen-denominated transactions with a decrease in dollar-denominated transactions since 2016 and a gradual rise in yen-denominated transactions. This trend returned to normal in 2021, followed by a rapid shift from dollar-denominated to yen-denominated transactions against the backdrop of the Russian-Ukrainian crisis in 2022.

Graph 16: Invoice Currency Share Trends for Top 10 Countries (Mineral Fuels, %)⁴



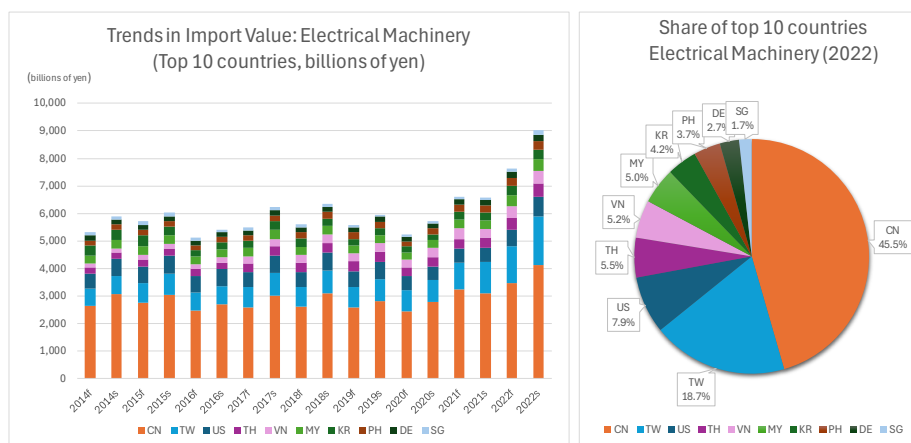
Source: Author's calculations based on customs data.

⁴ In the calculation process for the yen invoiced share and the local currency invoiced share of Mineral Fuels import data by country, some countries were excluded from the sample to ensure confidentiality due to the small number of customers. Therefore, the yen invoicing share graph does not include the 10 target countries, and the local currency invoicing share graph was not prepared. This does not necessarily mean that yen and local currency invoicing are not used.

Electrical Machinery

Graph 17 shows the import value trends and shares (as of 2022) for the top 10 countries in electrical machinery. Fluctuations in imports were cyclical, but the increase was more pronounced in 2022. As of 2022, China holds the top share, which accounts for less than 50%, but imports from Taiwan have been steadily increasing in recent years.

Graph 17: Share of imports in the top 10 countries (Electrical Machinery, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

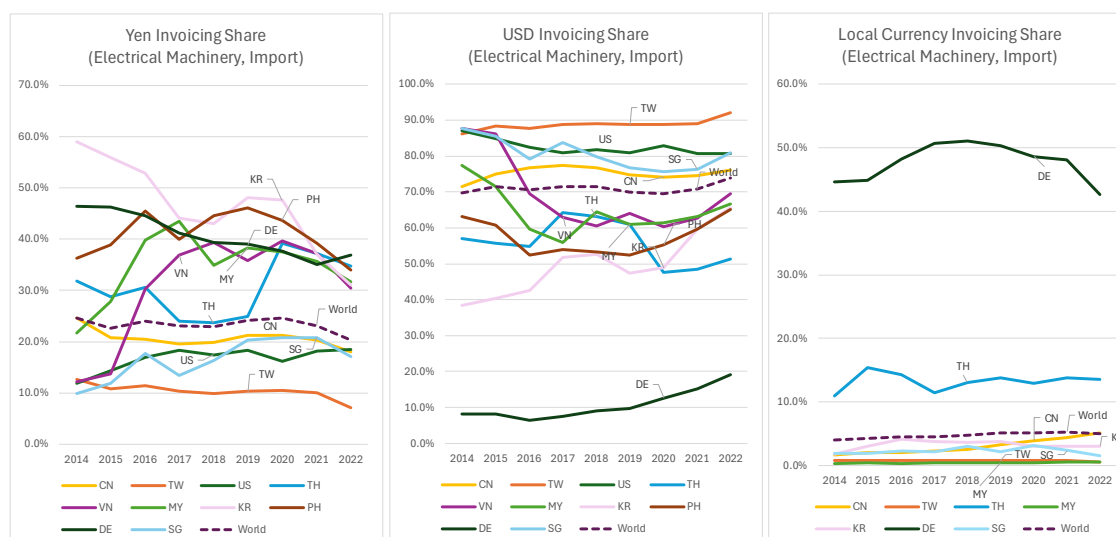
The top 10 import partners for electrical machinery are China, Taiwan, the U.S., Thailand, Vietnam, Malaysia, South Korea, the Philippines, Germany, and Singapore. The share of yen-invoiced imports to the rest of the world is in the 20% range, and the share of dollar-invoiced imports to the rest is around 70%, with no significant changes in local currency invoicing share.

The highest yen-invoiced share was 59.1% for imports from South Korea at the beginning of 2014, but it has since declined year by year to 31.1% in 2022. Similarly, imports from Germany, the Philippines, and Malaysia have also seen their yen-invoiced share decline in recent years. Imports from Vietnam, which accounted for 12.2% of total imports in 2014, rose sharply to nearly 40% but declined again to 30.4% in 2022. Imports from Malaysia have been similar to those from Vietnam, with almost 40% of imports being yen-invoiced by 2020 but dropping to the low 30% range in 2022, the most recent year available. Imports from the U.S. were 11.8% in 2014 but rose moderately to 18.5% in 2022. Similarly, imports from Singapore have increased from less than 10% in 2014 to nearly 20% share in yen-invoiced.

The highest share in U.S. dollars comes from Taiwan, where more than 90% of imports are expected to be in U.S. dollars by 2022. Imports from China are stable at the 70% level. In Vietnam and Malaysia, where the yen-invoiced share had been rising, the dollar-invoiced share has declined. However, it will return slightly again after 2020. Characteristically, in imports from Germany, whose dollar-invoiced share was less than 10% in 2014, it gradually increased, approaching nearly 20% in 2022, while the yen- and euro-invoiced shares are declining.

The share in local currency is highest for imports from Germany, which reached the 50% level from 2017 to 2019 but has declined in recent years, remaining roughly in the 40% range. In Asia, imports from Thailand have the highest share in local currency, hovering in the low 10% range. In contrast, the share of imports from other Asian countries in local currency remains low, at less than 5%, except for China.

Graph 18: Invoice Currency Share in the top 10 Countries (Electrical Machinery, %)



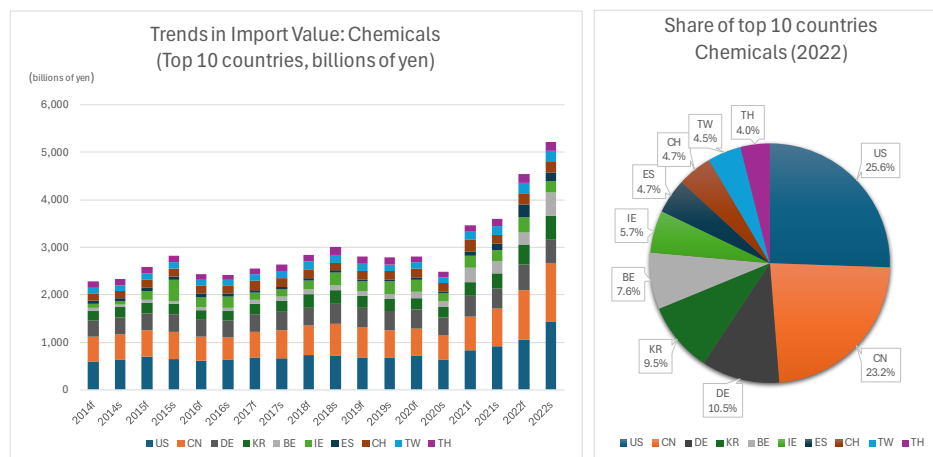
Source: Author's calculations based on customs data.

Chemicals

Graph 19 shows the trends in import value and share (as of 2022) of the top 10 countries in chemicals. Imports had not fluctuated significantly before COVID-19, although there were some ups and downs. However, since the COVID-19 period, imports have increased sharply from 2021. Imports from the U.S., the top importer, and China, the second-largest importer, together accounted for nearly 50% of total imports as of 2022. In recent years, imports from

Belgium and other European countries have also increased.

Graph 19: Share of imports in the top 10 countries (Chemicals, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

The top 10 import partners for chemicals are the United States, China, Germany, South Korea, Belgium, Ireland, Spain, Switzerland, Taiwan, and Thailand. The yen-invoiced share of imports to the world has been hovering around 50%, with a slight increase to 50% in recent years. The share in dollars has been in the 40% range but has declined somewhat in recent years. The share in local currency is around 6%, showing no significant change. By country, the difference from the world share is noticeable in each country, with considerable fluctuations in imports from Europe.

Imports from Ireland had the highest yen-invoiced share, fluctuating between 70% and 90%. After 2021, the yen-invoiced share of imports from Spain and Belgium increased to over 90%. Imports from Switzerland also have a yen-invoiced share that rose from the 50% level in 2014 to the 70% level in 2020. Imports from the United States also went from the 30% level in 2014 to the 50% level in 2020. The yen-invoiced share of imports from Taiwan also hovers around 30%. Similarly, the yen-invoiced share of imports from China is not much higher, hovering around the 10% level.

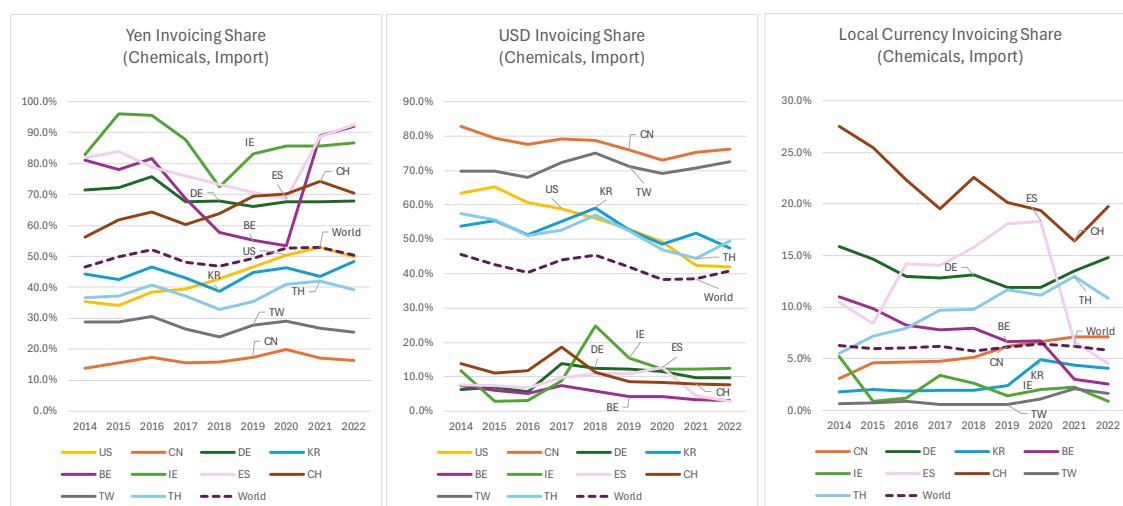
The highest dollar share is from China, followed by imports from Taiwan, which will exceed 70% in 2022. The dollar-invoiced share of imports from Thailand, South Korea, and the U.S. is declining, reaching less than 50% in 2022. The dollar-invoiced share of imports from Europe, which has a high yen-invoiced share, remains around 10 %.

The highest share in local currency is from Switzerland, but has been declining since

2014 and will be less than 20% after 2020. The euro-invoiced share of imports from Spain has been volatile, hovering in the 10% range and falling below 5% in 2022. The euro-invoiced share of imports from Germany has remained around 15%. In imports from Asia, the local currency-invoiced share in imports from Thailand, China, and Korea is small but, on the rise, and imports from Thailand have been in the 10% range since 2019.

Although imports of chemicals from the rest of the world appear to be evenly split between yen-invoiced and dollar-invoiced imports at around 50%, a country-by-country breakdown reveals a bifurcation between countries with high yen-invoiced imports and those with high dollar-invoiced imports.

Graph 20: Invoice Currency Share in the top 10 Countries (Chemicals, %)

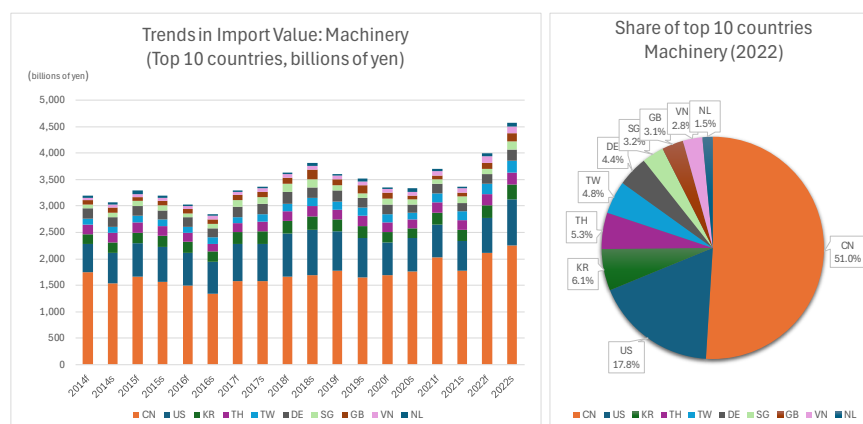


Source: Author's calculations based on customs data.

Machinery

Graph 21 shows the import value and share (in 2022) of the top 10 countries in machinery. Imports have been on a gradual upward trend, albeit with some ups and downs, and are expected to continue growing after 2022. Imports from China accounted for the largest share of imports in 2022, at more than 50%.

Graph 21: Share of imports in the top 10 countries (Machinery, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

The top 10 import partners for machinery are China, the United States, South Korea, Thailand, Taiwan, Germany, Singapore, the United Kingdom, Vietnam, and the Netherlands. The share of yen-invoiced imports in the world is around 30%, the share of dollar-invoiced imports is around 60%, and the share of local currency-invoiced imports is around 10%, not much change. Regarding the share of local currency invoicing by country, the difference from the global share is more pronounced in Germany and the Netherlands than in the United States and Asian countries.

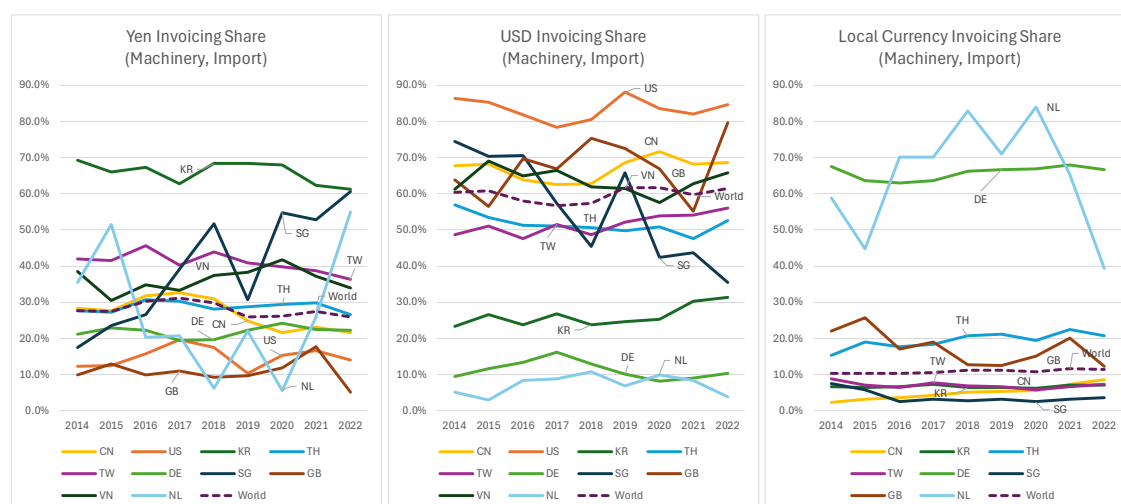
The highest yen-invoiced share comes from South Korea, where imports have remained in the 60% range but have been declining slightly in recent years. Next is imports from Singapore, whose yen-invoiced share, which was 17.5% in 2014, has grown to 60.6% in 2022, with significant fluctuations since then. Imports from Taiwan hovered around 40% but declined slightly in recent years, reaching 36.3% in 2022. Imports from Vietnam also remained at 30%. Imports from China increased to 32.6% in 2017 but have been declining since then, reaching 21.5% in 2022. Regarding imports from Europe, while Germany's share has remained around 20%, the yen-invoiced share of imports from the Netherlands has fluctuated widely from year to year, reaching a low of 5.6% in 2020 but rising sharply to 54.9% in 2022. The yen-invoiced share of imports from the U.S. and the U.K. is relatively low, ranging from 10% to 20%.

The highest dollar-invoiced share is in imports from the U.S., which is in the 80% range, followed by imports from the U.K., which are expected to reach just under 80% by 2022. The dollar-invoiced share of imports from China is also the highest among Asian imports, at

around 70%. Imports from Thailand and Taiwan remain at around 50%, while the dollar-invoiced share of imports from Singapore is on a marked downward trend, falling from 74.4% in 2014 to 35.5% in 2022. Imports from South Korea have increased moderately, rising from the 20% level to the 30% level in 2021. The dollar share from Germany and the Netherlands remains low at around 10%.

The highest local currency-invoiced shares are imports from Germany and the Netherlands. While Germany's share in euros of imports remains stable at the 60% level, the share in euros of imports from the Netherlands has been fluctuating between the 40% and 80% range, falling below 40% in 2022, with yen-invoiced imports increasing in its place. Thailand has the highest share of imports from Asia, at almost 20% after 2018. For imports from other Asian countries, the share in local currency remains below 10%.

Graph 22: Invoice Currency Share in the top 10 Countries (Machinery, %)

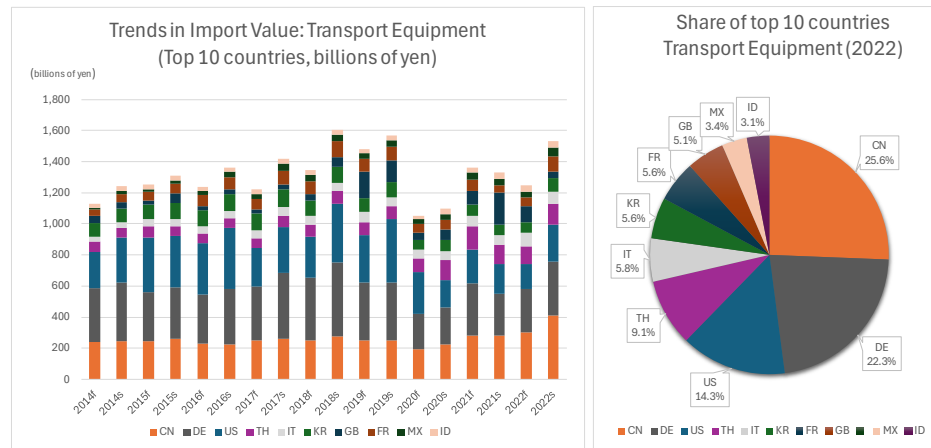


Source: Author's calculations based on customs data.

Transport Equipment

Graph 23 shows the changes in import value and share (as of 2022) of the top 10 countries in the transport equipment. The change in imports had been on a gradual upward trend until the pre-COVID-19 period. Still it declined sharply during the COVID-19 period and remained sluggish thereafter, finally returning to the pre-COVID-19 level in the second half of 2022. As of 2022, the top share is held by imports from China, which accounts for almost a quarter of the total, and has overtaken imports from the U.S. and Germany, which were previously at the top of the list, indicating a change in ranking by the top three countries.

Graph 23: Share of imports in the top 10 countries (transport equipment, billions of yen)

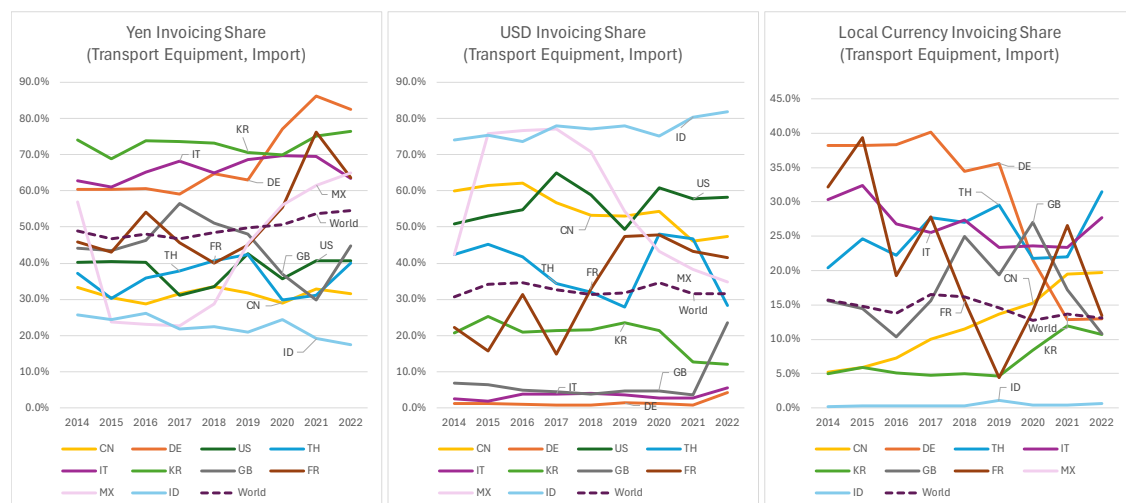


Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

The top 10 import partners for transport equipment are China, Germany, the United States, Thailand, Italy, South Korea, France, the United Kingdom, Mexico, and Indonesia. The yen-invoiced share of imports to the world gradually increases from less than 50% to 54.4% by 2022. The dollar-invoiced share is hovering around 30%, while the local currency-invoiced share is hovering around 15%, but is trending slightly lower. By country, the difference from the global share differs greatly from one country to another.

Graph 24: Invoice Currency Share in the top 10 Countries (Transport Equipment, %)



Source: Author's calculations based on customs data.

The highest yen-invoiced share is the imports from Germany, at over 80% as of 2022. This is followed by imports from South Korea, where the share is in the 70% range. Imports from Italy remain stable at 60%, while the yen-invoiced share of imports from France fluctuates from 45.8% in 2014 to 76.2% in 2021 and then to 63.5% in 2022. Imports from Mexico also dropped to 20% in 2015, then began an upward trend in 2018, reaching 65% in 2022. Imports from the U.S. have hovered around 40%. Imports from Thailand are similarly hovering between 30% and 40%, while imports from China are slightly lower at around 30%. Imports from Indonesia have been on a gradual downward trend, from around 25% to less than 20% by 2021.

The highest dollar share is from Indonesia, where the dollar share grew from 70% in 2014 to 80% in 2021. Imports from Mexico were in the 70% range in 2015 but dropped sharply after 2019 to 34.8% in 2022. A growing yen-invoiced share has replaced this. The dollar-invoiced share of imports from the U.S. has remained between 50% and 60%. In imports from China, the dollar-invoiced share, which was 60% in 2014, is gradually declining, reaching 47.5% in 2022. Similarly, the dollar-invoiced share of imports from Thailand fluctuated between 40% and 50%, but dropped to 28.3% in 2022, to indicate a declining trend, albeit one with considerable variability. In contrast, baht-invoiced imports appear to be growing instead. The dollar-invoiced share from France has also fluctuated wildly, going from around 20% in 2014 to 40% in 2019. Imports from South Korea have gradually declined from 20% to 12.2% in 2022. Germany and Italy have almost no dollar share, but imports from the U.K. have a U.S. dollar share that rises to 20% in 2022.

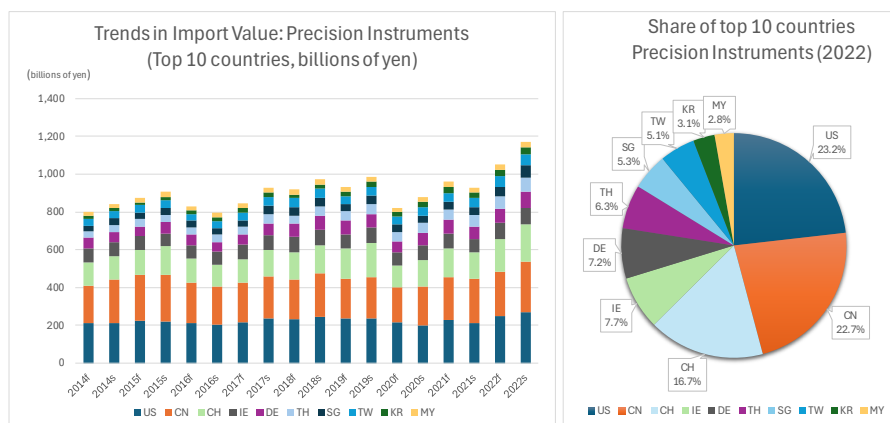
As for the share in local currency, imports from Germany and France were much higher, in the 30% range, but have fluctuated sharply since 2018, dropping to the 5% range from France and 10% from Germany. Instead, yen-invoiced imports are growing. For imports from Thailand, South Korea, and China, the home currency denomination is on the rise, especially for imports from China, where the yuan-invoiced share has risen from 5.2% in 2014 to nearly 20% in 2022, at 19.8%. Similarly, the won-invoiced share of imports from South Korea doubled from 5% to 10% in 2021.

Precision Instruments

Graph 25 shows the import value and share (in 2022) of the top 10 countries in the precision instruments category. Imports fluctuated repeatedly, but a notable increase is

evident from 2022. After the U.S. and China, European countries, including Switzerland, Ireland, and Germany, also import a large share of precision instruments. Imports from the U.S. and China, the top two countries as of 2022, were close, accounting for almost half of the total. However, in recent years, the share from other countries, such as those in Europe, has been increasing.

Graph 25: Share of imports in the top 10 countries (precision instruments, billions of yen)



Note: f next to the number of years indicates the first half period (January 1 to June 30) and s indicates the second half period (July 1 to December 31).

Source: Author's calculations based on customs data.

The top 10 import partners for precision instruments are the United States, China, Switzerland, Ireland, Germany, Thailand, Singapore, Taiwan, South Korea, and Malaysia. The yen-invoiced share of imports to the world has ranged from 40% to just under 50%, while the dollar-invoiced share has gradually declined from 40% to 30% since 2016. The local currency-invoiced share has remained in the low 10% range, reaching 15% in 2022. The difference in global share by country is noticeable in local currency invoicing, but the change is not so drastic by country.

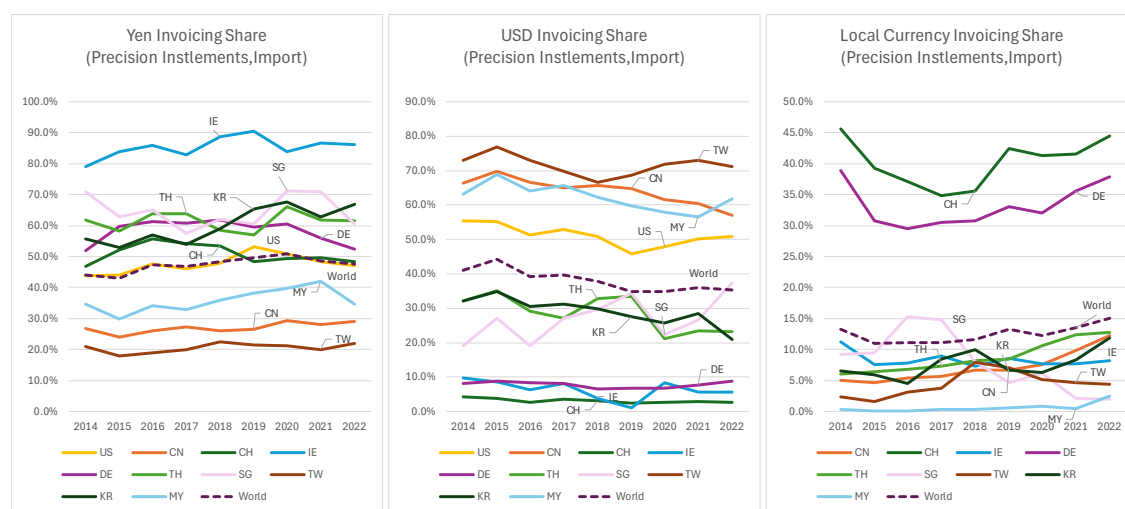
The highest yen-invoiced share came from Ireland, where imports remained almost at 80%. Imports from Singapore were following, hovering between 60% and 70%, but were overtaken by imports from South Korea, which were on the rise in 2022. Imports from Thailand also hovered around 60%. Imports from Germany, which had been in the 50% to 60% range, have been downward in recent years, reaching 52.4% in 2022. Imports from Switzerland were similarly in the 50%-60% range but have declined slightly to 48.4% in 2022. In both cases, the yen share has declined, while the share invoiced in the home currency has risen. The share from the U.S. remains in the 40% range, about the same as the share to the world. The yen-invoiced share of imports from China is in the 20% range, while the share of imports from Taiwan has not changed much,

hovering around 20%.

Imports from Taiwan have the highest share in dollars, but their share in the 70% range in 2014 is gradually declining, hovering around 70%. Similarly, imports from China, which had been close to 70%, are declining progressively in dollar share, reaching 57% in 2022. A similar trend can be seen in imports from Malaysia. In imports from the U.S., the share in dollars, which was 55.3% in 2014, has slightly declined to 50.9% in 2022. In imports from Thailand, the dollar share, which was 30%, has declined in recent years to 23.1% in 2022, while in imports from Singapore, the dollar share, which was less than 20%, has risen and down, reaching 37.3% in 2022. The dollar-invoiced share of imports from Europe is low, at less than 10%.

The highest share in home currency is from Switzerland, where the share in Swiss francs, which was 45.7% in 2014, once fell to 35% and then rose again, returning to 44.4% in 2022. Similarly, for imports from Germany, the share invoiced in euros was nearly 40% in 2014, then declined below 30 %, and rose again, returning to i 37.8% in 2022. In Asian countries, imports from Singapore saw a decline in the Singapore dollar-invoiced share, but otherwise, the share is on an upward trend. For imports from China, the yuan-invoiced share grew from 5% in 2014 to 12.3% in 2022. Similarly, in imports from Thailand and South Korea, the share invoiced in local currency has grown, rising to the same level as in China in 2022.

Graph 26: Invoice Currency Share in the top 10 Countries (Precision Instruments, %)



Source: Author's calculations based on customs data.

The above confirms that the invoice currency share of imports by country and industry has changed more significantly than exports in some countries and industries due to the recent rise in geopolitical risk and supply chain restructuring.

4. Summary

As the first phase of a publicly solicited study using customs data, this study calculates the share of invoice currency in Japan's imports and exports by industry and by country to identify its characteristics from the granular data set. The invoice currency share data by country, which was compiled from customs data, revealed that each country has its characteristics, but not only the characteristics of trading partners but also the industry of traded goods is involved in the choice of invoice currency share, with some industries changing significantly over the sample period from 2014 to 2022. The most significant change compared to 2014 is in precision instruments. In exports, the share of exports invoiced in U.S. dollars has declined, while the share of exports invoiced in yen and the share of exports invoiced in local currencies have increased. A similar trend was observed for imports. This suggests that the intensification of the U.S.-China trade war and the spread of the COVID-19 pandemic have caused significant changes in the supply chain for precision instruments, leading to changes in the invoice currency share.

The main feature of this study is that the share of invoice currency by industry was further classified by country, and trends were observed. First, the industry sector with the highest yen-invoiced exports is machinery, which is consistent with the tendency in previous studies for industries with high competitiveness to prefer local currency-invoiced exports. In Asia, more than 80% of shipments to South Korea and Taiwan are invoiced in yen, while those to China are in the 60% range, showing a gradual upward trend. This suggests that Japanese machinery is a differentiated good to these countries. At the same time, exports to Europe and North America had a low yen-invoiced share and instead had a high share invoiced in the currency of the partner country. In particular, exports to the Netherlands, the gateway to European trade, were invoiced in euros and grew to 70%, indicating that Japanese companies are increasingly adopting a PTM strategy rather than yen-invoiced exports in the highly competitive European market. Interestingly, the invoice currency for the same machinery exports differs greatly depending on the destination country. In recent years, the baht-invoiced share of exports to Thailand has been in the 20% range, the highest among Asian countries, and future trends will be closely watched.

Second, the invoice currency for transport equipment exports differs significantly by destination country. While the share of yen-invoiced exports to the Middle East has been hovering around the 80% level, almost 100% of exports to the U.S. are invoiced in U.S. dollars, while the share of exports to Australia in the local currency has been in the 80% range, and even to Canada has risen to the 70% range in recent years. Japanese firms are adopting PTM strategies for developed countries such as Australia and Canada to stabilize local selling prices.

In addition, a notable change in recent years is that the yen-invoiced share of exports to the Middle East, which was more than 90% in 2014, has been declining, while dollar-invoiced exports have been growing instead. A similar trend is seen in exports to China. This is consistent with the empirical analysis of invoice currency choice conducted by Shimizu et al. (2024) using country-specific invoice currency shares based on the same customs data, where the widening inflation gap between Japan and the rest of the world and the depreciation of the yen negatively impacted yen-invoiced invoices. Unfortunately, the yen is no longer used for exports to the Middle East, which used to be invoiced almost exclusively in the yen due to the inflation gap and the depreciation of the yen.

Third, in the case of imports of precision instruments, the value of which has been on the rise in recent years, the choice of invoice currency varies widely from country to country, and the fluctuation of the choice of invoice currency is significant. In the case of European imports, more than 80% of imports from Ireland are invoiced in yen. In contrast, imports from Switzerland and Germany are invoiced in euros, but the fluctuations rise and fall from year to year. Imports from Asia are also divided between Singapore, South Korea, and Thailand, where the yen-invoiced share is high, and Taiwan, China, and Malaysia, where the dollar-invoiced share is high. Since precision instruments are classified as a category, the differences in import items from each country may be reflected in these differences in currency choice. Still, it is also likely that the supply chain structure for precision instruments, including exports, is changing recently, particularly in Asia.

Fourth is the currency choice of countries such as Russia, as manifested in mineral fuel imports. Regarding mineral fuel imports from Russia, the share of yen-invoiced mineral fuel imports, less than 20% in 2014, has doubled to nearly 40% by 2022. This captures Russia's move to reduce dollar-invoiced imports and increase yen-invoiced imports against heightened geopolitical risk and financial sanctions due to the Russian Ukrainian crisis⁵. Also, in mineral fuel imports from Indonesia, instead of a declining U.S. dollar-invoiced share, the yen-invoiced share has grown rapidly, from 20% in 2014 to 50% in 2018 and beyond. MOUs (Memorandum of Understanding) on the economy, energy, environment, finance, and other issues have been signed between Japan and Indonesia in recent years, and further research will be needed to determine whether these developments are helping to promote yen-invoiced usage.

⁵ The share invoiced in Russian rubles and other partner currencies is expected to have increased during this period. Still, that information is not clear due to the number of clients in the data.

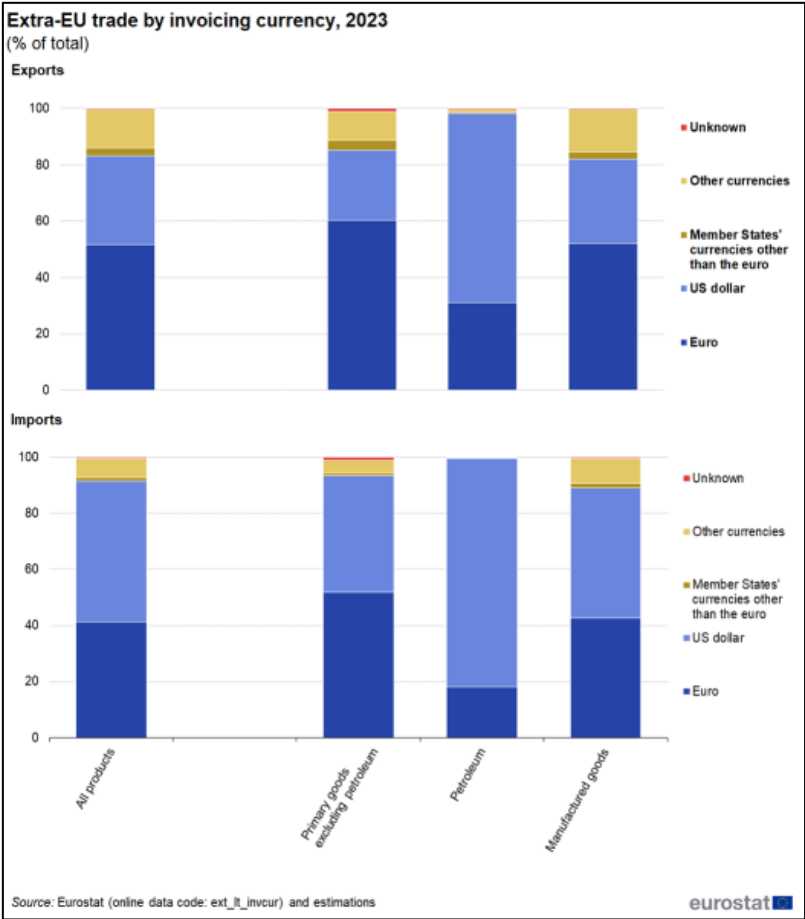
As described above, we can see that the share of invoice currencies in exports and imports by country and industry varies from country to country and industry to industry, and there are various essential issues behind these changes. Our data indicates that the invoice currency shares aggregated in trade with the world do not necessarily reflect changes in invoice currency shares or the actual use of partner country currencies. The production structure surrounding Japan's manufacturing industry is likely to change significantly in the future against the backdrop of the recent rise in geopolitical risk and restructuring of the supply chain. By using the characteristics of this data by country and industry, we can predict future changes in the invoice currency share. In addition, confirming in which countries and in which industries the use of local currencies is increasing, or the share of yen-invoiced currencies is growing is valuable information that will help companies select invoice currencies for new trade. To promote the Japanese yen invoicing for trade settlements, further research on the utilization of invoice currency share data is expected.

While this paper's industry classification based on 12 items (including others) is sufficient to represent each industry's characteristics, it is insufficient to analyze the differences and the background of the change in invoice currency. Although it has been believed that many European firms have adopted a PTM strategy toward Japan in many cases, most European exports to Japan are invoiced in the yen for transportation equipment, chemical products, and precision instruments, but rather in the euros for general machinery. What factors determine whether or not a PTM strategy is adopted? Conventional studies of Japanese firms' invoice currency choice have pointed out that they do not choose the yen invoicing for intra-firm trade because the head office bears the foreign exchange risk, and that they can choose the yen invoicing because of their high competitiveness, i.e., strong bargaining power when exporting differentiated goods. However, whether these stylized facts apply to the findings of this industry-specific analysis, such as the fact that in the case of general machinery, the yen invoice share is high in Korea for both imports and exports, but in the case of trade with the U.S., the dollar invoice share is high both in exports and imports, or whether there is another new reason for choice of invoice currency. More analysis under a more detailed classification is needed to explore the background in the future.

References:

- Boz E., Casas, C., Georgiadis, G., Gopinath, G., Le Mezo, H., Mehl, A., and Nguyen, T., 2022. Patterns of invoicing currency in global trade: New evidence,. *Journal of International Economics*, 136, 103604.
- COI_Report_2021, UK Trade in Goods by declared, Currency of Invoice, 2021 data, 2023, HM Revenue & Customs, Government UK.(Currency of invoice for UK trade, <https://www.gov.uk/government/statistics/currency-of-invoice-for-uk-trade>)
- Gopinath, G., Boz, E., Casas, C., Díez, F. J., Gourinchas, P.-O., and Plagborg-Møller, M., 2020, "Dominant Currency Paradigm ," *American Economic Review*, 110, pp. 677-719.
- International trade in goods by invoicing currency, 2024, Eurostat, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_trade_in_goods_by_invoicing_currency
- Ito, T., S. Koibuchi, K. Sato and J. Shimizu, 2012, "The Choice of an Invoicing Currency by Globally Operating Firms: A Firm-Level Analysis of Japanese Exporters," *International Journal of Finance and Economics*, **17(4)**, pp. 305-320.
- Ito, T., S. Koibuchi, K. Sato and J. Shimizu (2018) *Managing Currency Risk: How Japanese Firms Choose Invoicing Currency*, Edward Elgar.
- Ito, T., S. Koibuchi, K. Sato, J. Shimizu and T. Yoshimi (2021) "The Dollar, the Yen, or the RMB? Currencies among Japanese Overseas Subsidiaries," RIETI Discussion Papers, 21-E-016.
- McKinnon, R. I. (1979) *Money in International Exchange: The Convertible Currency System*, Oxford University Press.
- Shimizu, Junko, Takatoshi Ito, Ken Koibuchi, and Kiyotaka Sato (2021), "Exchange Risk Management of Japanese Firms: Rationale, Strategy and Puzzle of Currency Selection", Nihon Keizai Shimbun Publishing. (in Japanese)
- Shimizu, Junko, Takatoshi Ito, Kiyotaka Sato, Taiyo Yoshimi, Kenta Ando, and Uraku Yoshimoto (December 2022) "Trade Denomination Currency Choice of Japanese Firms: What We Can Learn from the Share of Invoice Currencies by Country Based on Aggregated Customs data," Ministry of Finance Policy Research Institute Discussion Paper https://www.mof.go.jp/pri/research/discussion_paper/ron348.pdf (in Japanese)
- Shimizu, J., K. Sato, T. Ito, Y. Yoshida, T. Yoshimi, and U. Yoshimoto, 2024, "Invoice Currency Choice and its Determinants in Japanese Trade: New Evidence from Japanese Customs Data," PRI Discussion Paper 24A-02.

Appendix 1: Extra-EU trade by invoicing currency, 2023 (% of total) by Eurostat



Source: Extracted from Eurostat, Extra-EU trade by invoicing currency, 2023 (% of total).

Appendix 2: Percentage of currency of invoice by SITC section for Non-EU Trade 2021

<UK Import>

SITC Sections	US dollar (%)	Pound sterling (%)	Euro (%)	Canadian dollar (%)	All others (%)	None declared (%)	Total trade (£m)
0 Food and live animals	52.1	32.9	9.2	0.7	4.4	0.6	12,494
1 Beverages and tobacco	19.9	60.5	4.3	0.1	15.3	0.0	1,560
2 Crude materials, inedible, except fuels	66.8	20.5	7.1	2.1	3.5	0.0	7,755
3 Mineral fuels, lubricants and related materials	47.9	13.4	0.4	0.0	0.0	38.2	42,241
4 Animal and vegetable oils, fats and waxes	92.5	4.0	2.8	0.0	0.6	0.1	717
5 Chemicals and related products not elsewhere specified	50.9	35.7	8.6	0.2	4.5	0.0	21,807
6 Manufactured goods classified chiefly by material	73.3	19.0	5.4	0.1	2.1	0.0	33,320
7 Machinery and transport equipment	60.7	28.7	6.9	0.3	3.3	0.0	74,607
8 Miscellaneous manufactured articles	63.9	25.7	5.7	0.3	4.4	0.0	43,461
9 Commodities and transactions not classified elsewhere in the SITC	71.6	0.4	0.4	12.3	2.1	13.3	44,191
Total	61.4	21.0	4.7	2.2	2.9	7.8	282,153

<UK Export>

SITC Sections	US dollar (%)	Pound sterling (%)	Euro (%)	Swiss franc (%)	All others (%)	None declared (%)	Total trade (£m)
0 Food and live animals	8.7	38.9	27.0	0.3	1.6	23.5	13,252
1 Beverages and tobacco	12.9	48.7	10.3	0.2	14.3	13.7	7,041
2 Crude materials, inedible, except fuels	21.8	57.7	10.2	0.0	0.3	10.1	9,563
3 Mineral fuels, lubricants and related materials	37.7	29.7	0.5	0.0	0.2	31.9	25,462
4 Animal and vegetable oils, fats and waxes	19.7	20.5	43.5	*	0.7	15.6	606
5 Chemicals and related products not elsewhere specified	29.8	30.3	24.3	1.0	4.7	9.9	52,208
6 Manufactured goods classified chiefly by material	32.8	37.7	17.8	0.0	1.4	10.2	35,281
7 Machinery and transport equipment	36.0	35.4	15.8	0.1	5.4	7.4	111,108
8 Miscellaneous manufactured articles	22.5	48.1	16.2	0.5	4.1	8.7	37,704
9 Commodities and transactions not classified elsewhere in the SITC	45.5	8.0	3.3	6.6	0.0	36.6	48,085
Total	32.7	33.0	14.7	1.2	3.5	15.0	340,309

Source: excerpted from UK Trade in Goods by declared Currency of Invoice, 2021 data, HM Revenue & Customs.

Appendix 3: Main Commodities’ Product Code - HS Code Converter as of April 2022

	sector #	Export HSコード	Import HSコード
MINERAL FUELS	3	2701～2705, 2708～2713, 2715, 340311～340319	2701～2705, 2708～2713, 2715, 340311～340319
CHEMICALS	5	1108～1109, 1520, 2207, 240412, 240419-9, 240492～240499, 2706～2707, 28～31, 3201～3214, 321511～321519, 33, 3401～3402, 340391～340399, 3404～3405, 3407, 35～36, 3801～3815, 3817～3822, 3824～3921	1108～1109, 1520, 2207, 240412, 240419-2, 240492～240499, 2706～2707, 28～31, 3201～3214, 321511～321519, 33, 3401～3402, 340391～340399, 3404～3405, 3407, 35～36, 3801～3815, 3817～3822, 3824～3921
MANUFACTURED GOODS	6	4005～4014, 4016～4017, 4104～4114, 411510, 4201, 4205, 4302, 440121～440122, 4410～4421, 4503～4504, 48, 5004～5007, 5106～5113, 5204～5212, 5306～5311, 54, 5508～5516, 56～60, 6301～6308, 6501～6502, 701913, 701961～701973	4005～4014, 4016～4017, 4104～4114, 411510, 4201, 4205, 4302, 440121～440122, 4410～4421, 4503～4504, 48, 5004～5007, 5106～5113, 5204～5212, 5306～5311, 54, 5508～5516, 56～60, 6301～6308, 6501～6502, 701913, 701961～701973
NON-METALLIC MINERAL WARE	609	251990-11, 251990-9, 252020, 2522～2523, 3816, 68～69, 7001～7018, 701911, 701914～701919, 701980～701990, 7020～7101, 710231～710239, 7103～7104	251990-09, 252020, 2522～2523, 3816, 68～69, 7001～7018, 701911, 701914～701919, 701980～701990, 7020～7101, 710231～710239, 7103～7104
IRON AND STEEL PRODUCTS	611	7201～7203, 720450, 7205～7307	7201～7203, 720450, 7205～7307
NONFERROUS METALS	613	7106～7107, 7110～7111, 7402～7403, 7405～7412, 7502, 7504～7507, 7601, 7603～7609, 7801, 7804, 7901, 790390, 7904～7905, 8001, 8003, 800700-1, 8101～8103, 810411～810419, 810430～810490, 8105～8113	7106～7107, 7110～7111, 7402～7403, 7405～7412, 7502, 7504～7507, 7601, 7603～7609, 7801, 7804, 780600-1, 7901, 790390～790500, 790700-1, 8001, 8003, 800700-1～-3, 8101～8103, 810411～810419, 810430～810490, 8105～8113
MANUFACTURES OF METALS	615	7308～7326, 7413～7419, 7508, 7610～7616, 7806, 7907, 800700-9, 82, 8301～8303, 8306～8311	7308～7326, 7413～7419, 7508, 7610～7616, 780600-9, 790700-9, 800700-9, 82, 8301～8303, 8306～8311
MACHINERY	701	8401～8413, 841410～841440, 841459～841490, 8415～8417, 841830～841891, 841899-9, 8419～8421, 842219～842290, 8423～8449, 845020～845110, 845129～846719, 846781～846799, 8468～8487, 850819～850870, 852842, 852852, 852862, 8608, 870110, 870130, 870191-1, 870192-1, 870193-1, 870194-1, 870195-1	8401～8413, 841410～841440, 841459～841490, 8415～8417, 841830～841899, 8419～8421, 842219～842290, 8423～8449, 845020～845110, 845129～846719, 846781～846799, 8468～8487, 850819～850870, 852842, 852852, 852862, 8608, 870110, 870130, 870191-01, 870192-01, 870193-01, 870194-01, 870195-01
ELECTRICAL MACHINERY	703	841451, 841810～841829, 841899-1, 842211, 845011～845019, 845121, 846721～846729, 8501～8507, 850811, 8509～8512, 8514～8522, 852352, 8524～8527, 852849, 852859, 852869～853669, 853690～854460, 8545～8549, 901420～901490, 901730-1, 901811～901820, 901841, 901850-1, 901890-1～-2, 9022, 902620-1, 902790-1, 902830, 902920-1, 9030, 903180-1, 903190-1, 903210-1, 903289-1, 903290	841451, 841810～841829, 842211, 845011～845019, 845121, 846721～846729, 8501～8507, 850811, 8509～8512, 8514～8522, 852352, 8524～8527, 852849, 852859, 852869～853669, 853690～854460, 8545～8549, 901420～901490, 901730-01, 901811～901820, 901841, 901850-01, 901890-021, 901890-023, 9022, 902620-01, 902781, 902789-01, 902790-01, 902830, 902920-01, 9030, 903180-01, 903190-01, 903210-01, 903289-01, 903290
TRANSPORT EQUIPMENT	705	8601～8607, 8609, 870121～870129, 870191-9, 870192-9, 870193-9, 870194-9, 870195-9, 8702～8709, 8711～8714, 8716～8802, 8806～8807, 89	8601～8607, 8609, 870121～870129, 870191-09, 870192-09, 870193-09, 870194-09, 870195-09, 8702～8709, 8711～8714, 8716～8802, 8806～8807, 89
PRECISION INSTRUMENTS	811	853670, 854470, 9001～9013, 901410, 9015～9016, 901710～901720, 901730-9, 901780～901790, 901831～901839, 901849, 901850-9, 901890-3～-9, 9019～9021, 9023～9025, 902610, 902620-9, 902680～902789, 902790-9, 902810～902820, 902890～902910, 902920-9, 902990, 903110～903149, 903180-9, 903190-9, 903210-9, 903220～903281, 903289-9, 9033～9112, 9114	853670, 854470, 9001～9013, 901410, 9015～9016, 901710～901720, 901730-09, 901780～901790, 901831～901839, 901849, 901850-09～901890-01, 901890-022, 901890-024～-029, 9019～9021, 9023～9025, 902610, 902620-09, 902680～902750, 902789-09, 902790-09, 902810～902820, 902890～902910, 902920-09, 902990, 903110～903149, 903180-09, 903190-09, 903210-09, 903220～903281, 903289-09, 9033～9112, 9114
Others		Items other than the above	

Source: Prepared by the author based on the website of the Ministry of Finance Trade Statistics.

Note: “Manufactured Goods” here refers to products by raw material in principal commodity code excluding “Non-Metallic Mineral Ware”, “Iron and Steel Products”, “Nonferrous Metals”, and “Manufactures of Metals”.