

Chapter 1 Resilient Global Value Chains That Reflect Common Values

Section 1 The reality and challenges of global value chain

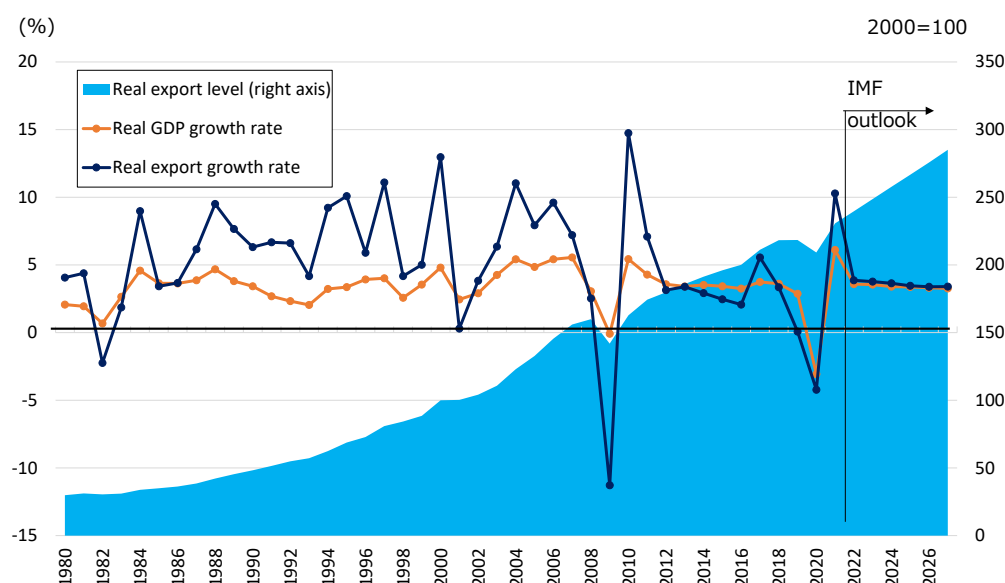
1. Changes in the global trade and investment structure

(1) Goods trade

This section examines long-term changes in the global trade and investment structure, and also looks at recent developments. Goods trade is continuing to grow in the long term, but structural changes can be seen both in terms of what goods are being traded, and with which countries.

Until the global financial crisis, exports had been growing at significantly higher rates than GDPs, with underlying factors being the growth in the international division of production and in the intermediate goods trade supporting it (Figure II-1-1-1). Outward foreign direct investment has fueled the transfer of production bases overseas, and as the international division of production has progressed, the goods being traded have shifted from final to intermediate ones. With regard to exports, it has been pointed out that intermediate goods get double-counted every time they cross borders along the global value chains, and this is why their growth surpassed that of GDPs, which are the sum of the pure added value, and do not include them. Exports' growth appears to have started to drop below GDPs' since the global financial crisis. This kind of trend is a phenomenon called "slow trade." As a cause, some experts point to the fact that more intermediate goods are being produced locally, halting the expansion of trade in them. Looking at recent trends, exports and GDPs both fell significantly in 2020 due to COVID-19 but grew again substantially in 2021 due to the backlash, with higher export values being recorded now than ever before. Looking ahead, the WTO and IMF predict that exports and GDPs will continue to grow in 2022 and beyond despite the increasing uncertainty in the global economy due to Russia's aggression against Ukraine.

Figure II-1-1-1. Trends in the growth rate of the global GDP and exports



Note: IMF outlook (as of April 2022) is displayed for 2022 and onward.

Source: *WEO, April 2022* (IMF).

Another factor that can be pointed to is the ongoing shift in emphasis from long-range inter-regional to short-range intra-regional trade. Short-range trade tends to be preferred in general anyway due to transportation costs, so coupled with a trend toward reducing tariffs and other trade costs through economic partnership agreements, this is leading to an increase in trade with countries in the same region (being nearby), and therefore to a rising share for intra-regional trade (Figure II-1-1-2).¹ Looking at this trend, we see that in the EU, intra-regional trade's share increased overall in the 1980s, and has remained at a high level of over 60% ever since, albeit with occasional drops due to changes in the member states². In North America, intra-regional trade's share rose until around 2000, then fell until around 2008, and has remained stably around 40% since then. In Asia, intra-regional trade's share has continued to rise up to the present among the following 16 nations (ASEAN+6): the 10 ASEAN member states (ASEAN10), which pursue regional liberalization; along with Japan, China, and the

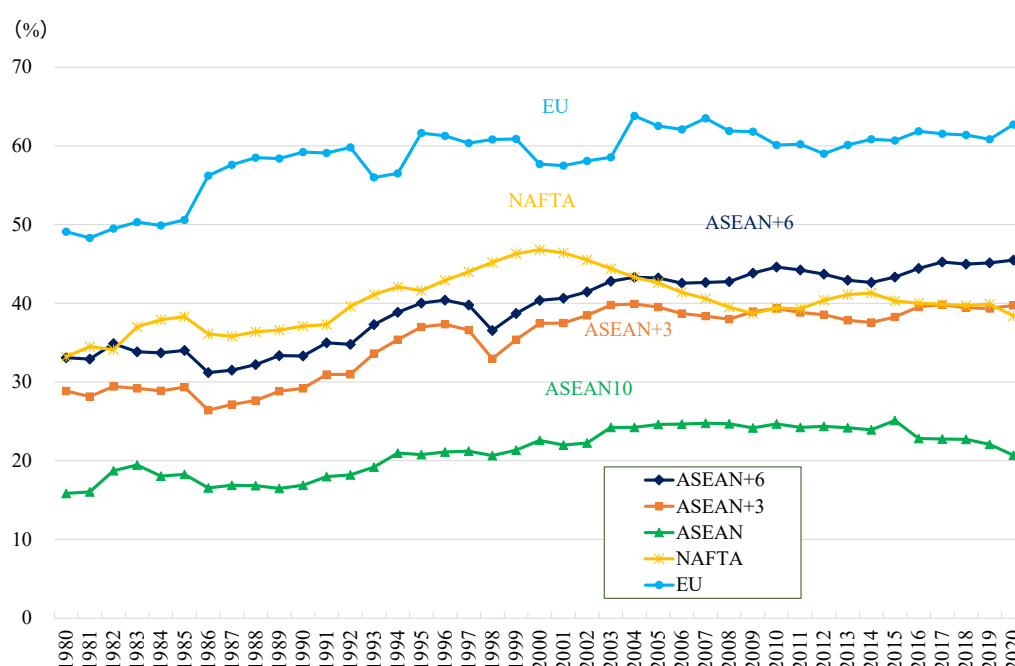
¹ In the gravity model used to quantitatively analyze trade, it is widely known that the distance between trading parties has a significantly negative effect on the trade value exchanged between them.

² Strictly speaking, it is necessary to monitor the same target countries continuously, but in the case of the EU, because the member states have frequently changed, the figures are based on the countries that were members of it in the year in question. It is therefore important to note that there are discontinuities in terms of the member states. Specifically, the figure for 1980 is based on the following nine countries: Italy, the Netherlands, Germany, France, Belgium, Luxembourg, Denmark, Ireland, and the UK. The figures for 1981 to 1985 are based on 10 countries, with Greece now included. For 1986 to 1994, they are based on 12 countries, with Portugal and Spain now included. For 1995 to 2003, they are based on 15 countries, with Austria, Finland, and Sweden now included. For 2004 to 2006, they are based on 25 countries, with Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia now included. For 2007 to 2012, they are based on 27 countries, with Bulgaria and Romania now included. For 2013 to 2019, they are based on 28 countries, with Croatia now included. The figure for 2020 is based on 27 countries, due to the withdrawal of the UK.

Republic of Korea (ASEAN+3), giving 13 countries; further joined by Australia and New Zealand, making all the members of the Regional Comprehensive Economic Partnership (RCEP) agreement; and in addition to all of these, India as well.³

The trends we thus see are that intermediate goods are accounting for an increasing share of trade, and intra-regional trade with short-range partners is on the rise.

Figure II-1-1-2. Trends in the share of intra-regional trade in the major regions



Notes: 1. Share of intra-regional trade = Total trade with countries in the region / Total trade with countries all around the world (Total trade = Exports + Imports)

2. Since the figures for the EU are based on the member states in the corresponding year, there are discontinuities in terms of which countries are included.

Source: *World Integrated Trade Solution* database (World Bank).

(2) Services trade

Next, we will take an overview of services trade around the world. Despite temporary setbacks due to factors such as the global financial crisis, services trade has also been growing over the long term, with its scale nearly doubling in the 14 years from 2005 to 2019, just before the COVID-19 crisis (Figure II-1-1-3). In terms of the trends in recent years however, it fell significantly in 2020 due to COVID-19, with travel services the worst hit. Looking at the growth rate by quarter, travel services suffered a massive drop into negative growth in 2020, and transportation services' growth went

³ ASEAN10 is the following 10 countries: Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Laos, the Philippines, Singapore, Thailand, and Vietnam. The ASEAN countries have been pursuing trade liberalization within the region through means such as the Common Effective Preferential Tariff Scheme (CEPT), which is based on the ASEAN Free Trade Area (AFTA) agreed on in 1992. Strictly speaking, Vietnam (1995), Laos (1997), Myanmar (1997), and Cambodia (1999) joined in the late 1990s, but the membership has not changed in recent years, and looking continuously at the same target countries is appropriate for seeing changes in trends. Mainly for this reason then, we have taken the expedient approach of compiling the data based on all 10 countries throughout the whole period.

negative as well (Figure II-1-1-4). Positive growth returned in the second quarter of 2021, at least in part due to the backlash to the previous year, and the level has been gradually recovering ever since, although it remains far from what it had become by 2019.

Figures II-1-1-3. Trends in world services exports (annual)

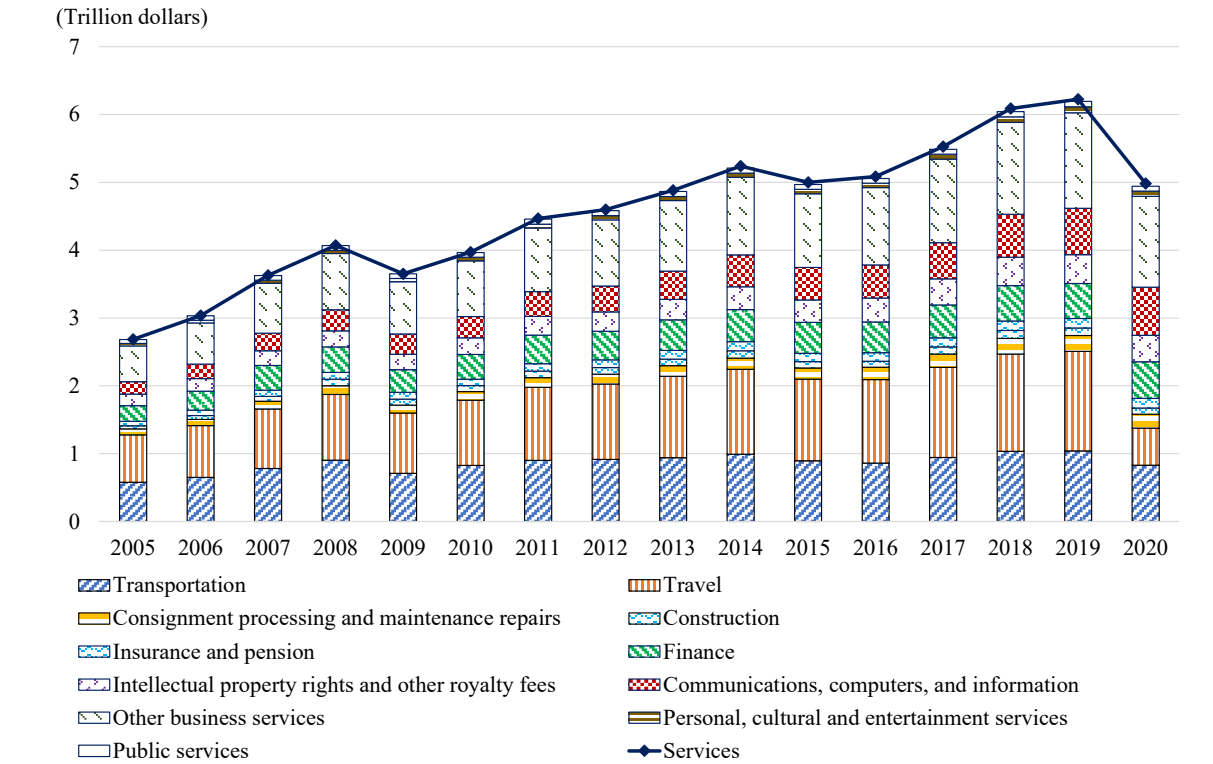
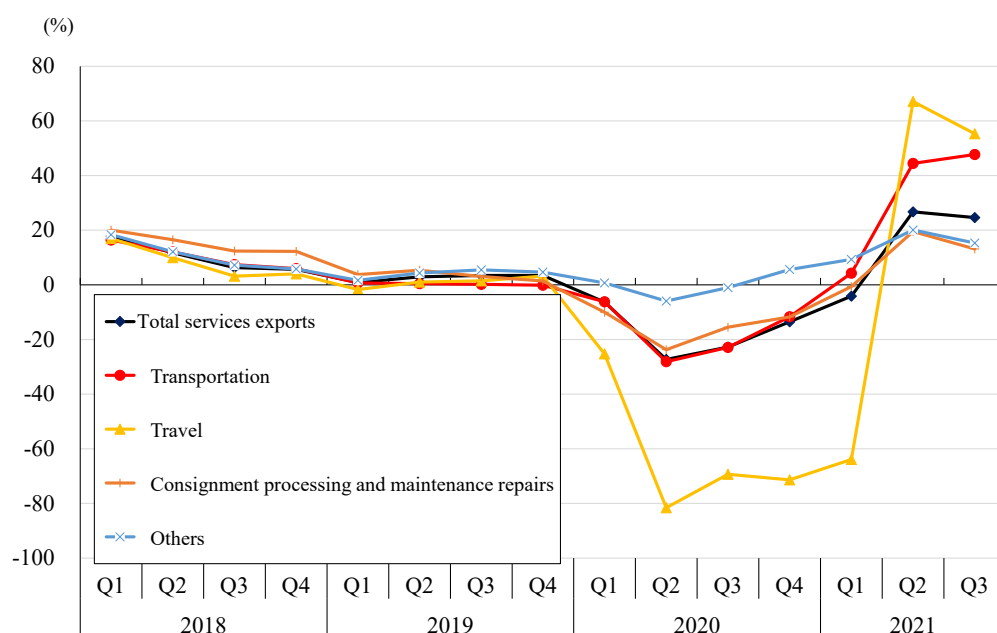


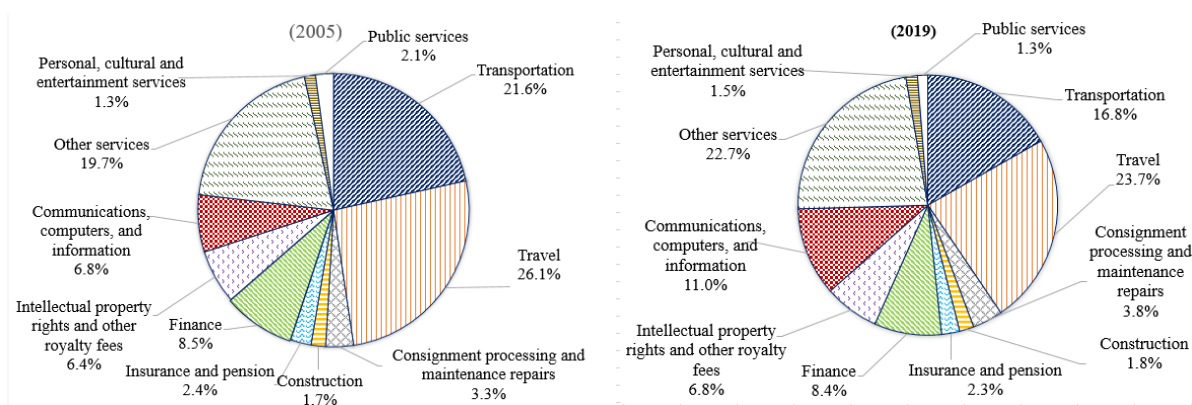
Figure II-1-1-4. Recent trends in the growth rate of services exports (Quarterly/year-on-year)



Source: UNCTAD database (UNCTADstat).

Looking at the long-term changes in the composition of services exports by comparing 2005 and 2019, we find that while "Transportation" and "Travel" saw their shares shrink, "Communication, computer, and information services" saw its share grow significantly, driven by the progress in information technology (Figure II-1-1-5).⁴ In addition, a large growth in share was also enjoyed by "Other business services," a category that includes a diverse range of business services such as technical ones related to fields such as construction and engineering, and specialized ones related to fields such as R&D, legal affairs, and accounting and management consulting.

Figure II-1-1-5. Long-term changes in the composition of services exports



Source: UNCTAD database (UNCTADstat).

Source: UNCTAD database (UNCTADstat).

⁴ Since COVID-19 had a major impact on the situation in 2020, the comparison was made with the previous year, namely, 2019.

Services trade details

Item	Details
Transportation	Transportation of passengers and cargo.
Travel	Goods and services acquired by travelers. E.g., spending on accommodation, food and beverages, local transportation, and souvenirs.
Other business services	
Outsourced processing services	Fees paid for outsourced processing. E.g., refining oil and liquefying natural gas
Maintenance and repair services	Maintenance and repairs. E.g., maintenance and inspection of ships and aircraft.
Construction	Construction and installation work.
Insurance and pension services	Insurance and pensions.
Financial services	Financial intermediation and business incidental to it. E.g., fees pertaining to banking business such as issuing letters of credit and guarantees and exchanging foreign currencies.
Intellectual property rights and other royalty fees	Royalties for things like industrial property rights (e.g., patents, utility models, and franchises) and copyrights (software, music, and literary works).
Communication, computer, and information services	Business based on IT-related services. E.g., usage fees for telephones and other means of communication, information processing, software development, and news streaming.
Other business services	Services provided by business operators other than the above. R&D, expert and management consulting (e.g., legal affairs and accounting and management consulting), and technical, trade-related, and other business services (e.g., construction and engineering).
Personal, cultural, and entertainment services	Services for particular individuals, and ones related to culture and entertainment.
Public services	Expenses for things like diplomatic missions abroad.

Source: *Balance of Payments Statistics—Overview of Accounting Methods by Item* (Bank of Japan website).

Experts have pointed out that the development of information and communication technology is closely related to the international division of production and the deepening of global value chains based on it. The increasing share of services trade accounted for by "Communication, computer, and information services" reflects that deepening. Baldwin (2016) says that by reducing the cost of movement, technological progress has brought about cross-border division of labor⁵. First, the invention of steamships and railroads reduced the cost of moving goods so much that entire industries' production activities could be transferred abroad (the first unbundling) (Table II-1-1-6). Next, advances in information and communication technology reduced the cost of moving ideas (e.g., technology and data) to the point where production technology and management know-how could be taken to emerging countries, enabling complex activities to be coordinated from afar (the second unbundling). This drove forward international division of labor in production processes at the level of

⁵ For details, see the White Paper on International Economy and Trade 2020, Part II, Chapter 2, Section 1, "The past, present and future of globalization seen from the viewpoint of the 'three unbundlings.'"

entire tasks, encouraging global value chains to deepen. Baldwin posits that further advances in information and communication technology will enable cross-border provision of services that had hitherto required meeting face-to-face, leading to dividing up tasks among individual people (the third unbundling).

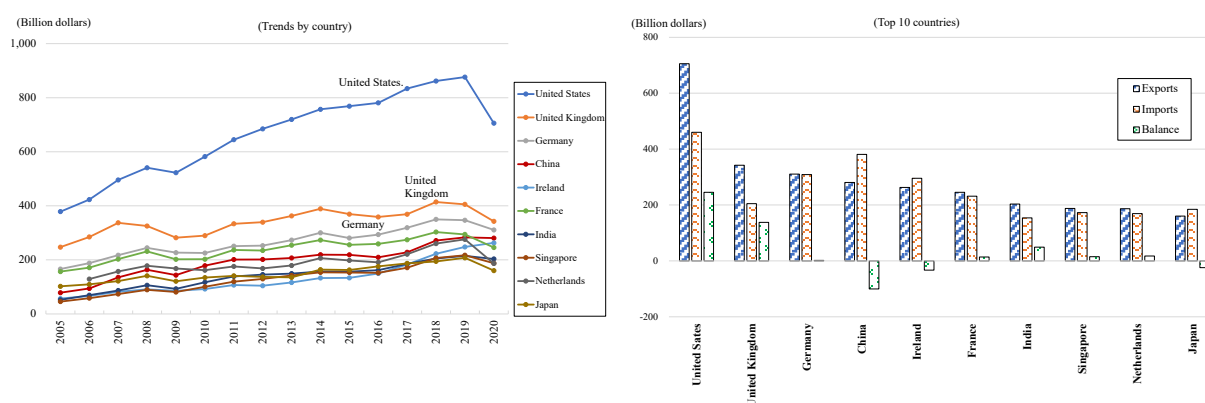
Table II-1-1-6. The three unbundlings

	When	New technologies	Decreased movement costs	Cross-border division
First unbundling	1820-1990	Steamboats, railroads	Cost of moving goods went down	Production (for entire industries) and consumption became divided
Second unbundling	1990-2015	Information and communication technology	Cost of moving ideas (e.g., technology and data) decreased	Production processes got divided up at the level of entire tasks
Third unbundling	2015-	Information and communication technology	Virtual movement of people is becoming possible	Tasks will be divided up among individual people

Source: Baldwin (2016), Kimura (2018).

Looking at the major services trade exporters, we see that the United States is in first place and the United Kingdom is in second, then the places below include Germany, China, and Ireland (Figure II-1-1-7)⁶. Moreover, the United States has a deficit with its goods trade, but a surplus with its services trade.

Figure II-1-1-7. Trends in services exports by country



Note: 1. The top 10 countries in 2020 are shown.
2. For some countries, the UNCTAD database only has data starting from years partway through.

Source: UNCTAD database (UNCTADstat).

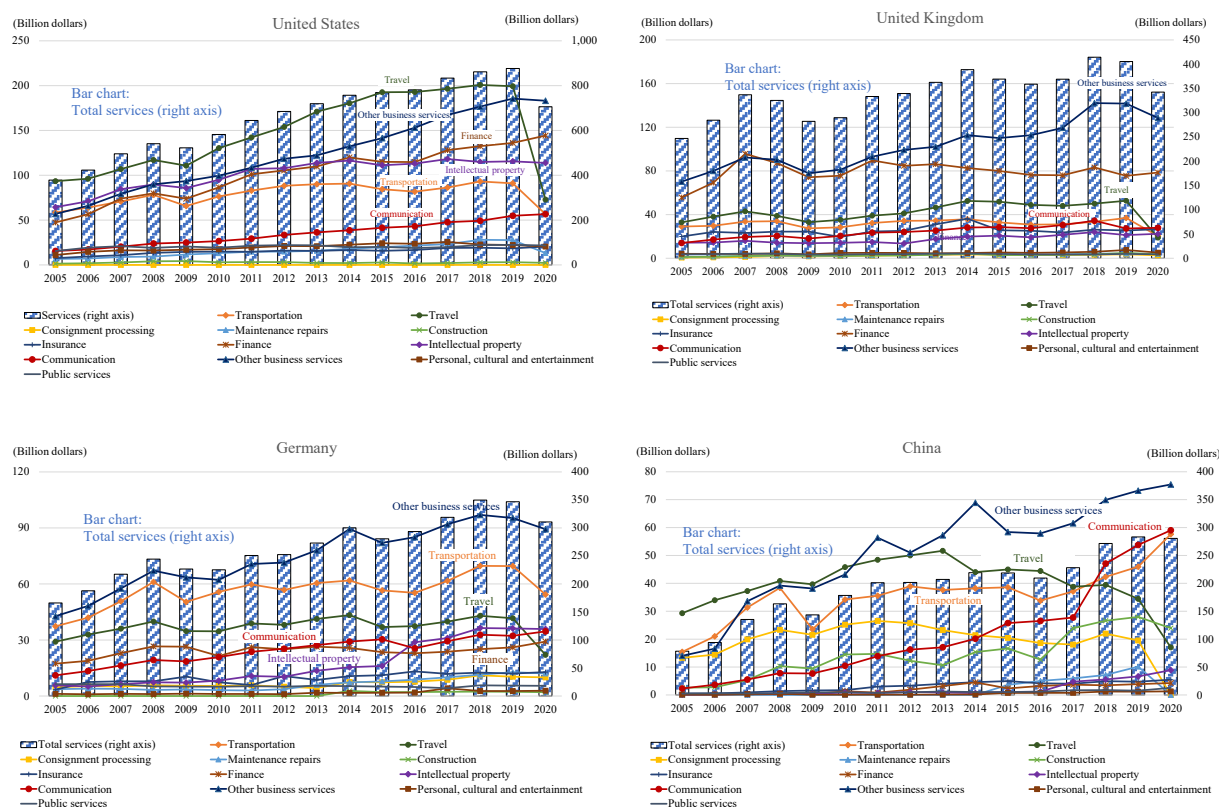
Note: The top 10 export countries in 2020 are shown. Some of their rankings are different, but the same countries are the top 10 importers as well.

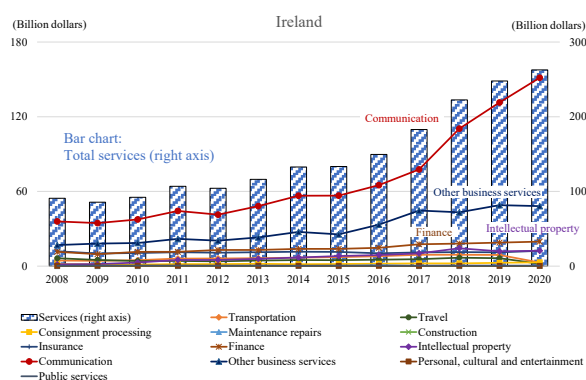
Source: UNCTAD database (UNCTADstat).

⁶ Unless otherwise stated, in this section, "China" refers only to the mainland, and does not include Hong Kong.

Looking at these countries' major export items, we find that while "Other business services" occupies a large share for all of them, country-specific characteristics can also be seen (Figure II-1-1-8). For example, in the United States, "Travel," "Finance," and "Intellectual property rights and other royalty fees" are major items, suggesting that it was a popular travel destination up to the COVID-19 crisis, and is a supplier of financial services and intellectual property to the rest of the world. For the United Kingdom, "Finance" is the largest item after "Other business services," although it is declining slightly in monetary terms. For Germany, "Transportation" is the largest export. For China, while "Travel" has been in gentle decline since the mid-2010s, "Communication" has seen rapid expansion, and "Transportation" has been growing as well. For Ireland, "Communication" has enjoyed conspicuous growth. Below that, we find "Other business services" (which covers things like legal affairs, accounting, and consulting), followed by "Finance."

Figure II-1-1-8. Services exports of the major countries





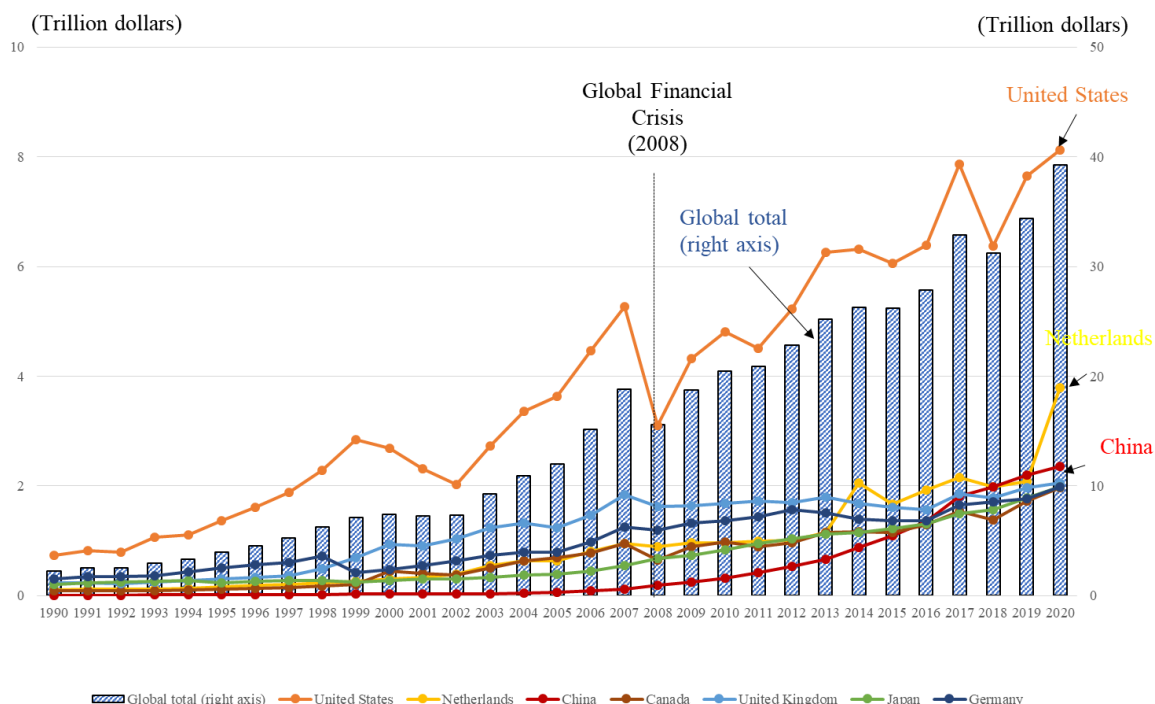
Source: UNCTAD database (UNCTADstat).

(3) Outward foreign direct investment

The global outstanding outward foreign direct investment has been growing over the long term (Figure II-1-1-9). The major developed countries' outward foreign direct investments have been increasing, with the United States' topping the list. Besides these, China's has also been increasing since the 2010s. According to the UNCTAD statistics, although a large share of the investments—around 70%—are going to developed countries, an increasing share of them are also going to China and other emerging ones (Figure II-1-1-10)⁷. In particular, China's outstanding inward foreign direct investment has enjoyed remarkable growth since the global financial crisis. This reflects the fact that production bases have been established in China and other emerging countries through direct investment, expanding the international division of production by taking advantage of low-wage labor. This kind of trade in intermediate goods between production bases will lead to the formation of global value chains.

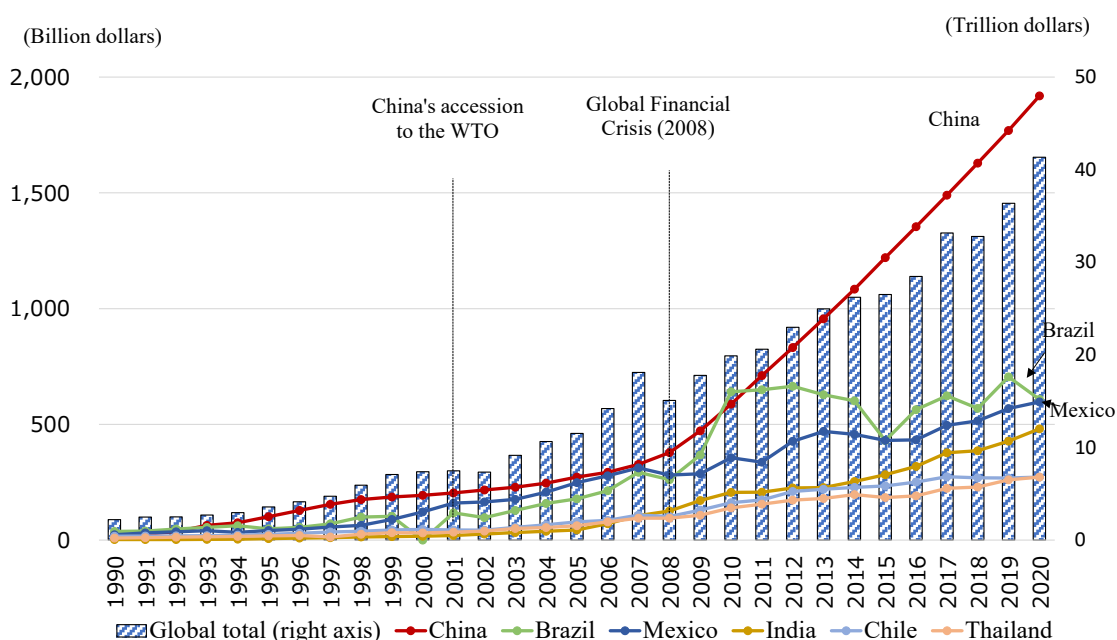
⁷ According to the UNCTAD statistics, the global outstanding inward foreign direct investment at the end of 2020 stood at approximately \$41.4 trillion, of which developed countries accounted for around \$28.7 trillion (69.4%), emerging ones for around \$11.8 trillion (28.5%), and ones whose economies are in transition for around \$0.9 trillion (2.1%). The classification of countries here follows the UNCTAD statistics.

Figure II-1-1-9. Trends in the outstanding outward foreign direct investment for the world's major countries



Source: UNCTAD website.

Figure II-1-1-10. Trends in the outstanding inward foreign direct investment for the world's major emerging countries



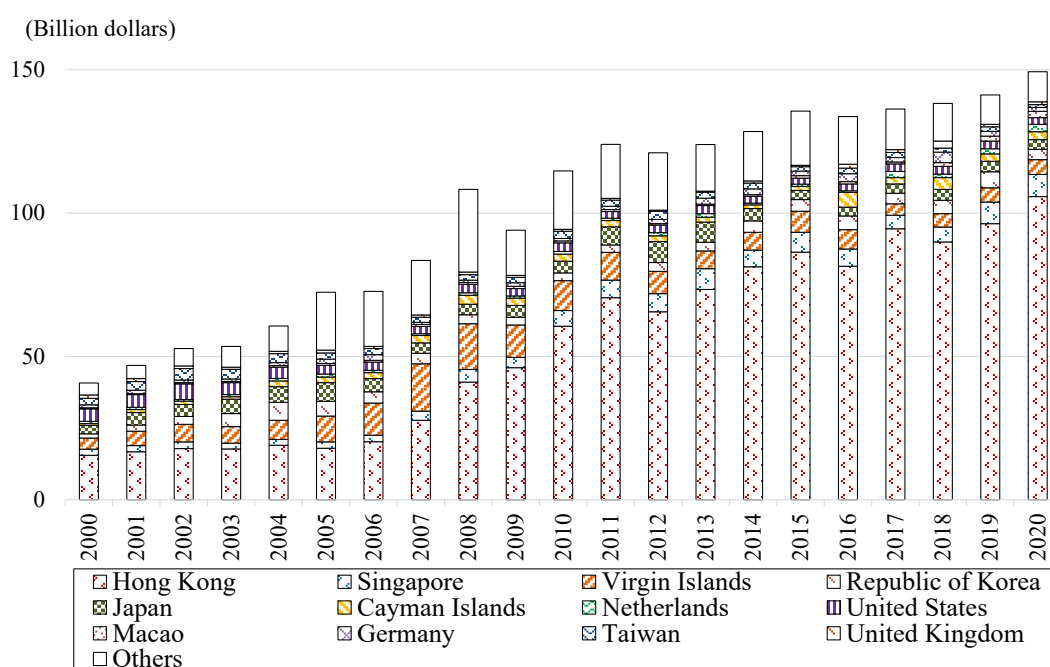
Note: The countries with the top balances in 2020 are shown.

Source: UNCTAD website.

China's inward and outward foreign direct investment

In view of the dramatic increase in foreign direct investment flowing into China, here, we will take a look at where the money has been coming from. In 2020, about 70% of it was from Hong Kong, which enjoys good access to China and freedom of economic activity. Financial centers with light tax burdens—notably the Cayman Islands, the Virgin Islands, Singapore, and the Netherlands—also feature prominently (Figure II-1-1-11). Other major investors are the Republic of Korea, Japan, and Taiwan within the Asian region, and the United States and Germany outside it. Although the actual sources of the investments are not clear because they pass through financial centers along the way, what is clear is that in the case of China, production bases are being sited there through inward foreign direct investment from the major countries.

Figure II-1-1-11. Trends in China's inward foreign direct investment (flow)

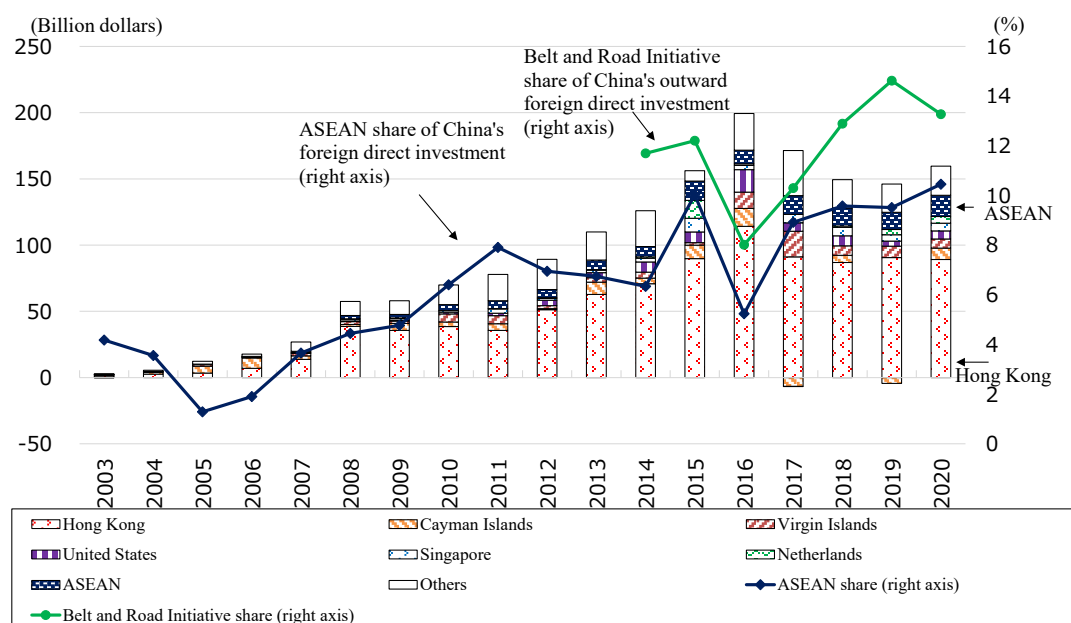


Note: The top countries/regions in 2020.

Source: Ministry of Commerce of the People's Republic of China, CEIC database.

China is getting a lot of inward foreign direct investment from the major countries, but since 2000, it has also been expanding its own outward foreign direct investment, as part of its "Go Global" policy. As a result, its outstanding outward foreign direct investment overtook its outstanding inward one in the mid-2010s. In terms of who is getting its outward foreign direct investment, as with its inward, the lion's share is accounted for by Hong Kong, where the tax burden is light and the relevant levels of regulation are low. And once again, financial centers like the Cayman Islands, the Virgin Islands, Singapore, and the Netherlands also feature prominently (Figure II-1-1-12).

Figure II-1-1-12. Trends in China's outward foreign direct investment (flow)



Notes: 1. ASEAN is based on 10 countries. Since they also include the separately listed Singapore, the amounts for "Other" have been adjusted down as an expedient way to make the totals correct.
 2. For the Belt and Road, only the share accounted for by non-financial industries is shown, because the statistics only relate to these. It also has some overlap with ASEAN as a region.
 Source: Ministry of Commerce of the People's Republic of China, CEIC database.

We will also look at the relationship between China and ASEAN. Although it is not clear where China's investments actually end up because there are financial centers along the way, the statistics show that ASEAN's share of China's outward foreign direct investment went up in the latter half of the 2010s⁸. Its outward foreign direct investment in the ASEAN countries continues to progress, and its economic presence to increase. The share going to the countries along the Belt and Road is also rising.

2. Japan's trade and investment trends

Having looked at the world's trade and investment trends, we now turn to Japan's.

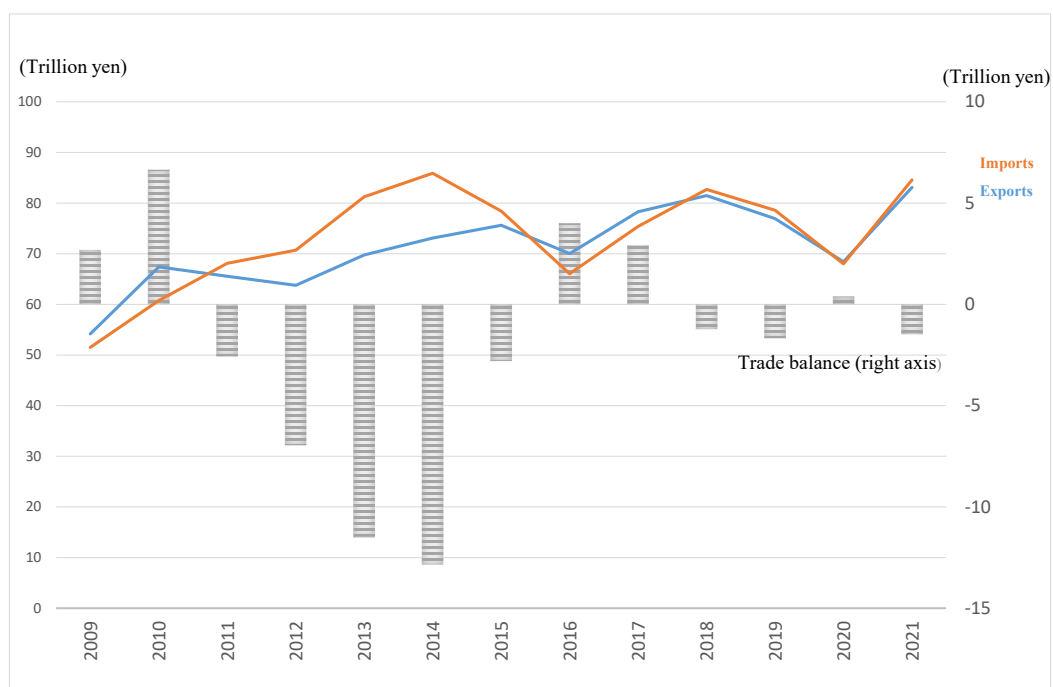
(1) Japan's trade trends

Japan's goods trade and import value in 2021 were 83.0914 and 84.7607 trillion yen respectively, up 21.5% and 24.6% respectively from 2020. Both exports and imports are showing signs of recovery, and have surpassed their pre-pandemic 2019 levels in terms of monetary value. Amid soaring prices of

⁸ And in case the picture is not already complete enough, the statistics for ASEAN's inward foreign direct investment also show that both the amount and share from China increased significantly in the latter half of the 2010s.

mineral fuels and other resources, imports increased more than exports, and the trade balance was -1.6694 trillion yen, going into deficit for the first time in two years (Figure II-1-1-13).

Figure II-1-1-13. Trends in Japan's trade balance



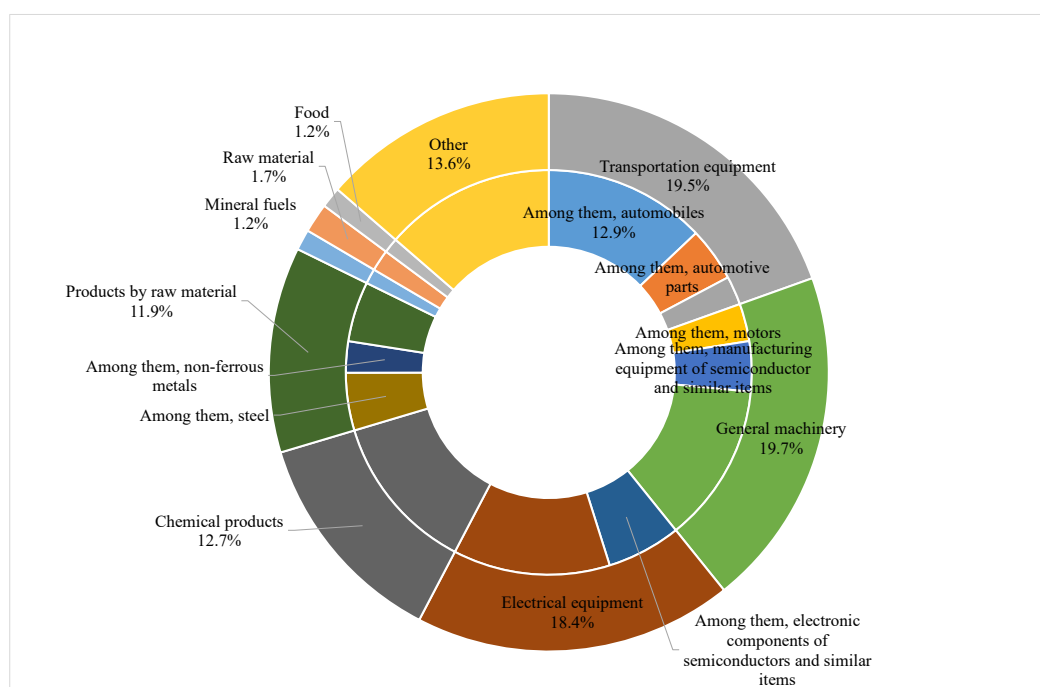
Source: Trade Statistics of Japan, CEIC.

(A) Trade trends by item

(Exports)

In 2021, about 60% of Japan's exports consisted of the top three machinery items which were transportation equipment (19.5%), general machinery (19.7%), and electrical equipment (18.4%) (Figure II-1-1-14).

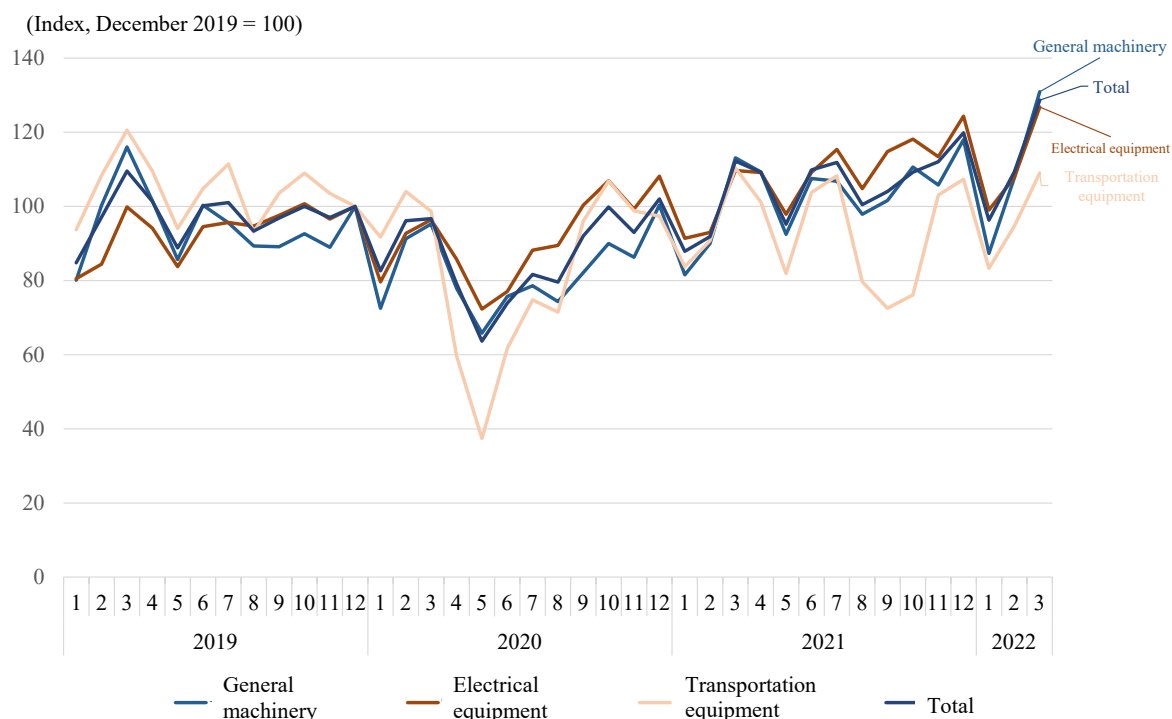
Figure II-1-1-14. Composition of Japan's exports (2021)



Source: Trade Statistics of Japan, CEIC.

If we examine the changes in exports by month, exports have gradually recovered since the middle of 2020 when it fell sharply due to the impact of COVID-19 (Figure II-1-1-15). By item, electrical equipment and general machinery are on a recovery trend. Compared to before the COVID-19 pandemic, transportation equipment remained roughly below the level of 2019 due to it being difficult to procure parts around the globe because of reduced automobile production. However, it shows that it is on a higher recovery trend compared to 2020. Sales of electrical equipment and general machinery are generally higher than they were before the spread of COVID-19, and remained at a higher level compared to 2020.

Figure II-1-1-15. Trends in the level of Japan's Exports (by item and month)

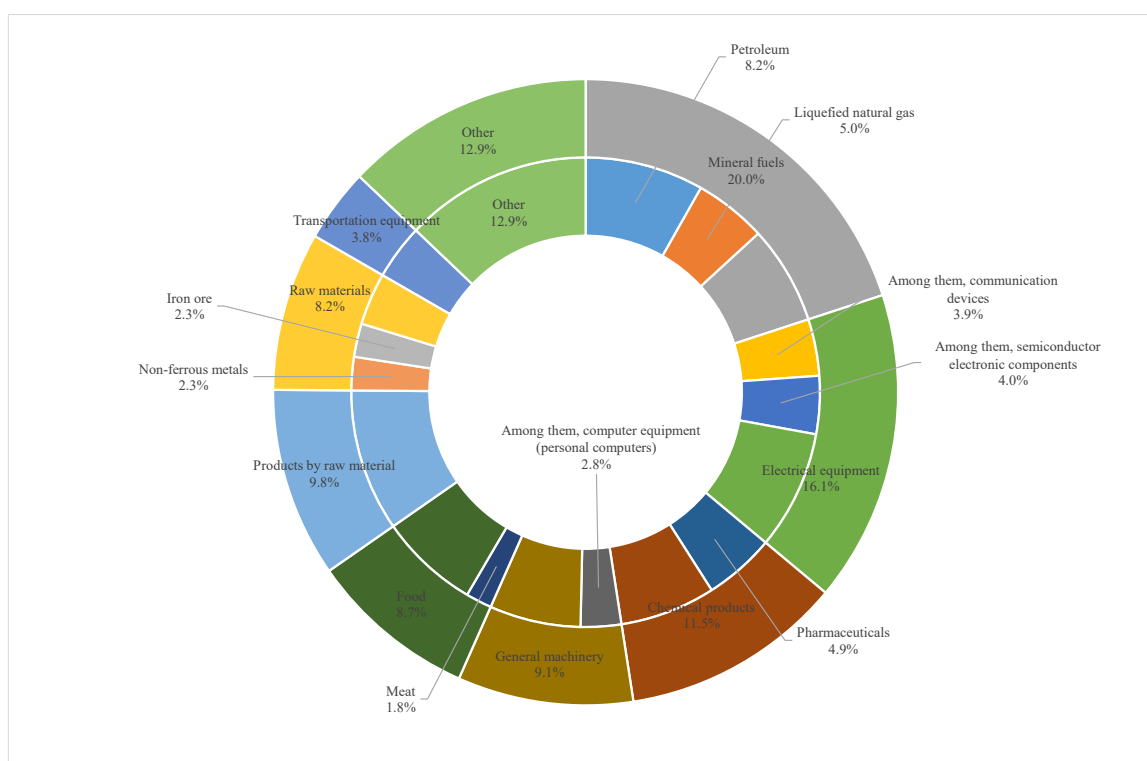


Source: Trade Statistics of Japan, CEIC

(Imports)

Looking at the composition of imports in 2021, about 20% of it consists of mineral fuels and 16.1% of it consists of electrical equipment (Figure II-1-1-16). Unlike exports, imports are characterized by a high proportion of resources and food, including mineral fuels (crude oil, natural gas, etc.), foodstuffs (meat, etc.), and raw materials (non-ferrous metal ore, iron ore, etc.). Although imports include intermediate goods for machine-related items such as semiconductors and other electronic components, it is also characterized by consisting of large amount of final goods such as communication devices and computer equipment (personal computers) due to the demand for telework in response to the spread of COVID-19.

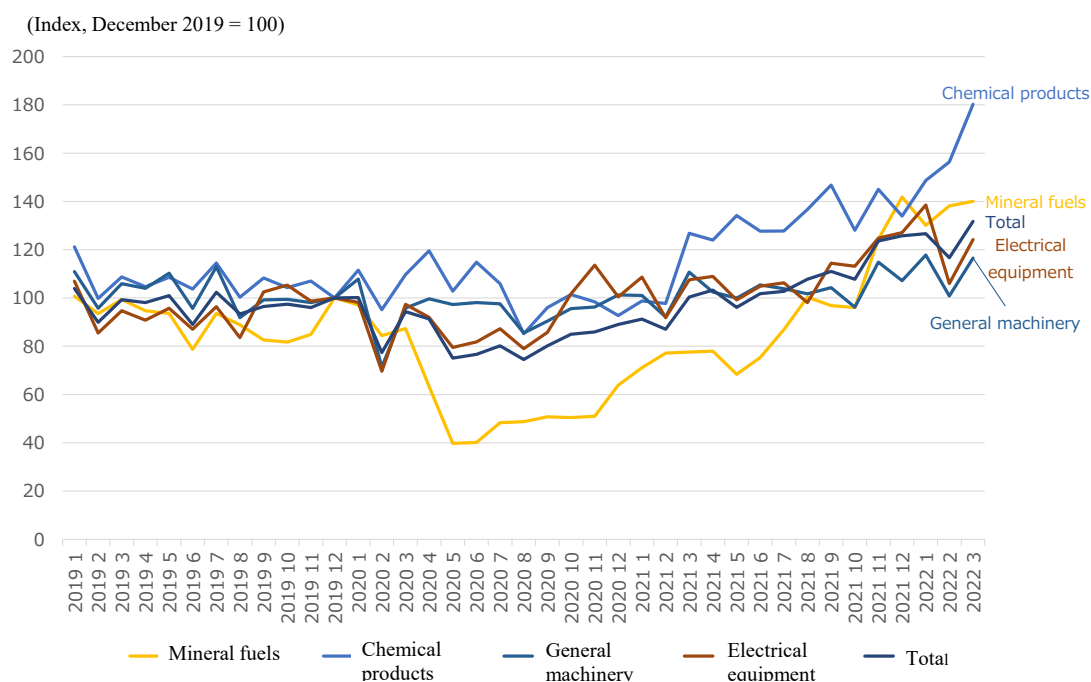
Figure II-1-16. Composition of Japan's imports (2021)



Source: Trade Statistics of Japan, CEIC.

Looking at the changes in imports by month, imports have been gradually recovering since the middle of 2020 (Figure II-1-17). By item, the level of mineral fuels is higher than the level before the COVID-19 pandemic through the second half of the year with underlying factors such as soaring resource prices. Due to the increase in demand for COVID-19 vaccines, chemical products, which account for about 40% of the total value of pharmaceuticals, have also been at a significantly higher level than before the spread of COVID-19 throughout the year. Electrical equipment and general equipment have also recovered from the decline in 2020, recovering to almost the same level as before the spread of COVID-19.

Figure II-1-17. Trends in the level of Japan's Imports (by item and month)

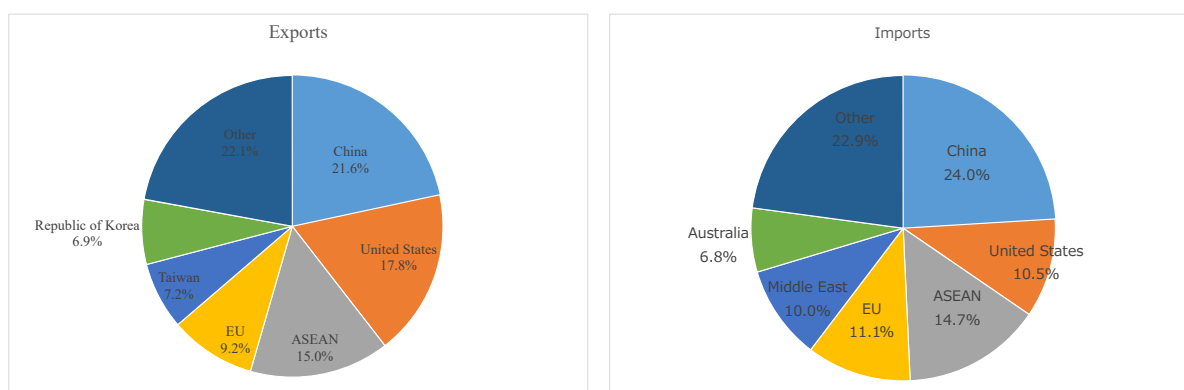


Source: Trade Statistics of Japan, CEIC.

(B) Trade trends by country and region

China, the U.S., ASEAN, and the EU were the top four countries and regions among Japan's export partners by region for both exports and imports in 2021, and account for about 60% of global exports and imports (Figure II-1-18). ASEAN and countries in the Asian region such as China, Taiwan, and the Republic of Korea account for approximately 60% of global exports and 50% of global imports showing that the region is important as a trading partner.

Figure II-1-18. Composition of Japan's major export and import partners (countries and regions)



Source: Trade Statistics of Japan, CEIC.

We shall now turn to trade trends by country and region in 2021. Firstly, looking at the growth rate by country and region, all countries and regions had positive growth in exports and imports in 2021

after the decline caused by COVID-19 in 2020. In particular, the growth rate of exports from countries and regions in Asia such as China was high at around 20%. Imports from the Middle East increased greatly to 52.4% due to soaring prices of mineral fuels (Table II-1-1-19).

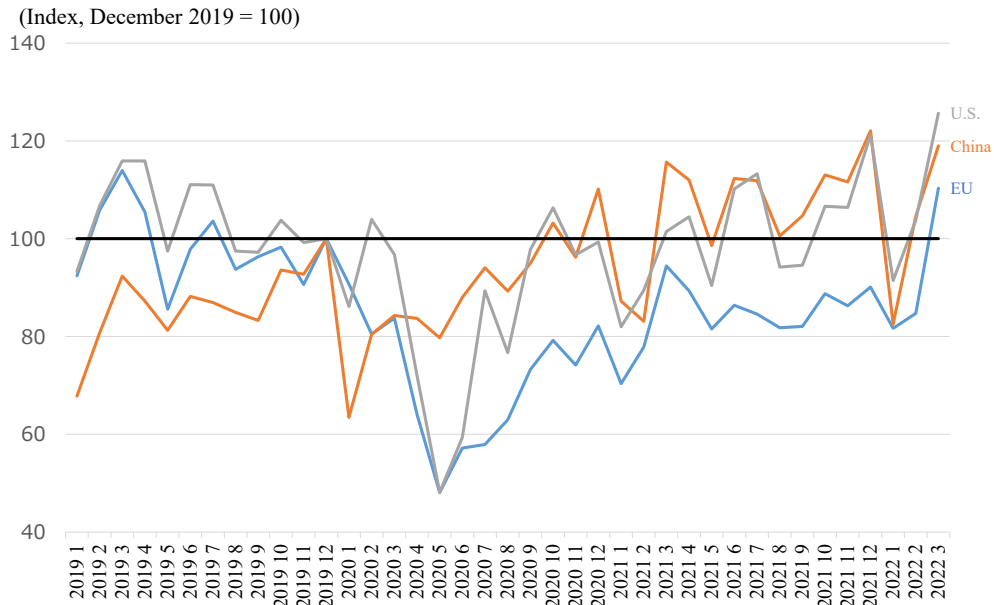
Figure II-1-1-19. Growth rates of Japan's major export and import partners by country and region

Export s			Imports		
	2020	2021		2020	2021
China	2.7%	19.2%	China	-5.1%	16.4%
ASEAN	-15.0%	26.6%	ASEAN	-9.2%	16.8%
Taiwan	1.1%	26.4%	United States	-13.7%	19.4%
Republic of Korea	-5.5%	21.0%	EU	-12.1%	21.4%
United States	-17.3%	17.6%	Middle East	-37.2%	52.4%
EU	-14.6%	21.4%	Australia	-22.7%	49.7%
Global	-11.1%	21.5%	Global	-13.5%	24.6%

Source: *Trade Statistics of Japan* (Ministry of Finance), CEIC.

Looking at the monthly trends by export partner and region, exports to China and the United States recovered from the decline in 2020 brought about by COVID-19, and are now almost back to their pre-pandemic levels of 2019 throughout the year. Exports to the EU were faring better than in 2020 at the beginning of the year, but the level stayed below 2019's for the whole year, revealing that the recovery was falling behind the other regions'. A decline in automobile exports due to the semiconductor shortage was a notable factor (Figure II-1-1-20).

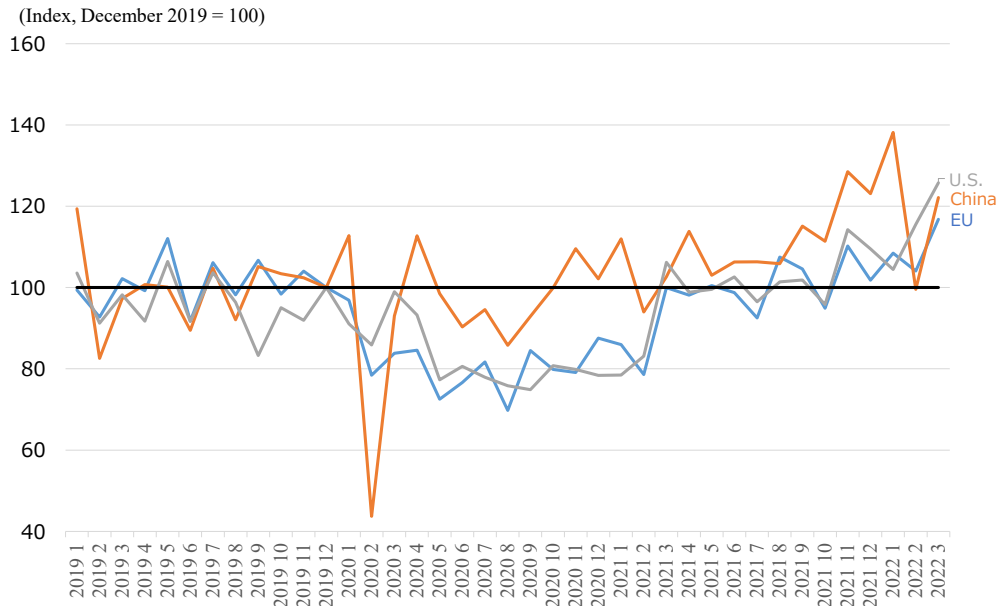
Figure II-1-1-20. Trends in Japan's export values



Source: *Trade Statistics of Japan* (Ministry of Finance), CEIC.

Turning to imports, those from China, the United States, and the EU have all recovered from 2020's decline, and are more-or-less fully exceeding their 2019 levels (Figure II-1-1-21).

Figure II-1-1-21. Trends in Japan's import values

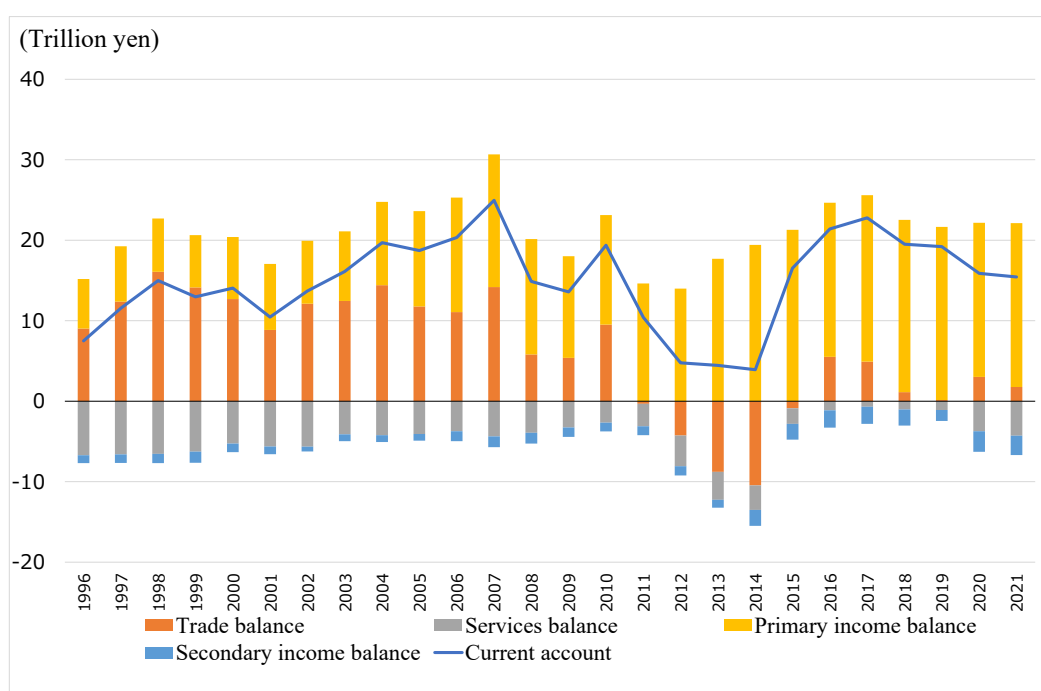


Source: *Trade Statistics of Japan* (Ministry of Finance), CEIC.

(C) Trends in the current account balance

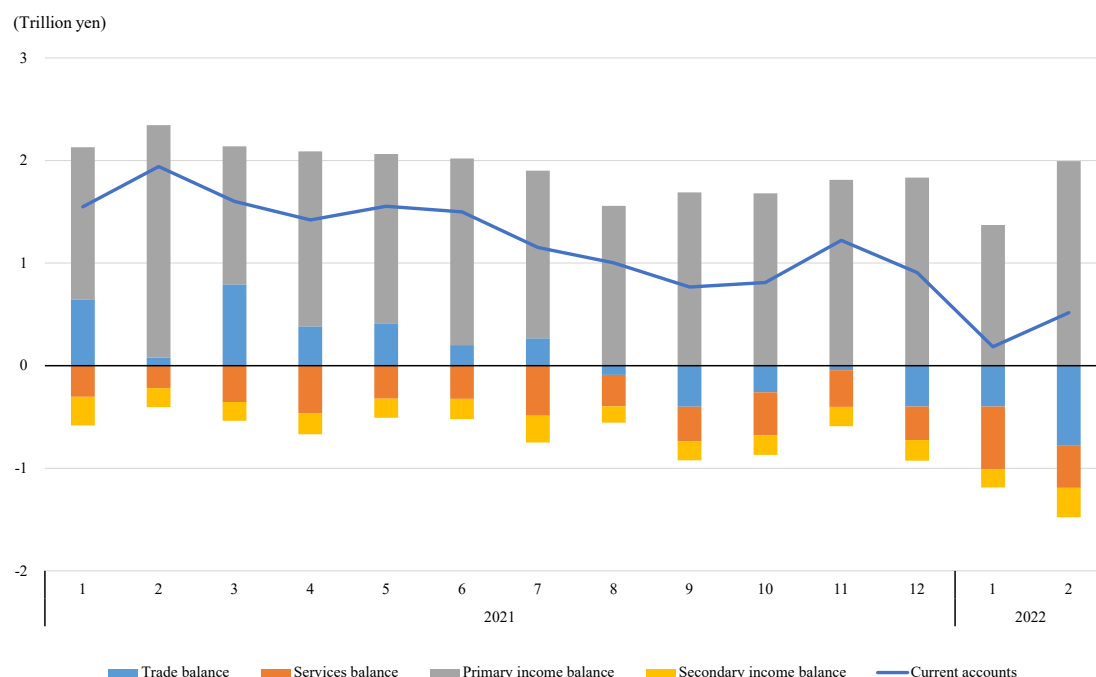
Japan's current account balance in 2021 was a surplus of 15.4359 trillion yen. The primary income and trade balances were in surplus, but the services and secondary income balances remained in deficit. The surplus was 443.1 billion yen (2.8%) lower than the previous year (Figure II-1-1-22). The reason for this is that although the primary income balance's surplus grew, the trade balance's shrank, notable factors being the surge in crude oil prices and decline in automobile exports due to the shortage in semiconductors. Another factor was that the services balance's deficit grew because the travel balance's surplus shrank. In terms of the trends by month, the current account balance's surplus has been decreasing because the trade balance has been in deficit since August (Figure II-1-1-23).

Figure II-1-1-22. Trends in Japan's current account balance (by year)



Source: *Balance of Payments statistics* (Ministry of Finance).

Figure II-1-1-23. Trends in Japan's current account balance (by month)



Note: Seasonally adjusted values.

Source: *Balance of Payments statistics* (Ministry of Finance).

Japan's current account balance's surplus has been shrinking in recent years, mainly due to shrinkage in the trade and services balances. Besides structural factors such as declining competitiveness in electrical equipment, materials, and other export industries, other trends have also been exerting downward pressure. Namely, the soaring prices of crude oil and other resources and the increase in imports of pharmaceuticals such as vaccines have pushed down the trade balance, and factors such as the huge decline in inbound tourism have widened the deficit in the services balance. It will be important to consider how to address these negative factors for the current account balance.

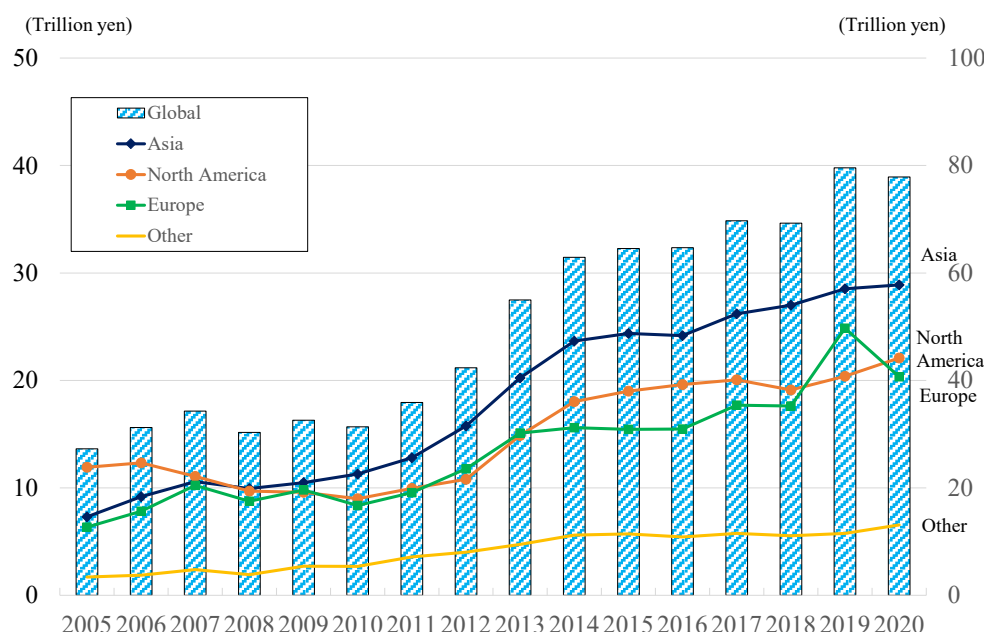
(2) Japan's outward foreign direct investment

This section looks at the trends in Japan's outward foreign direct investments, with a particular focus on those related to Japanese manufacturers pertaining to the nation's global value chains, which are analyzed in a later part. First, looking at Japan's outstanding direct investment by region, in the 2000s, while Europe and the United States only grew moderately, Asia came to occupy the largest share in the manufacturing industry⁹ (Figure II-1-1-24). From this point on, we will focus on the development of the Japanese manufacturing industry in Asia. In the trends by country and region in Asia, we find that China—the so-called "factory of the world"—is growing remarkably in monetary terms, with Thailand following in second place (Figure II-1-1-25). In Asia, China and Thailand have a large presence, far ahead of Singapore in third place. On the other hand, in terms of relative presence in

⁹ The chart starts at 2005, the year the outstanding balances by industry began to be released in the Balance of Payments statistics.

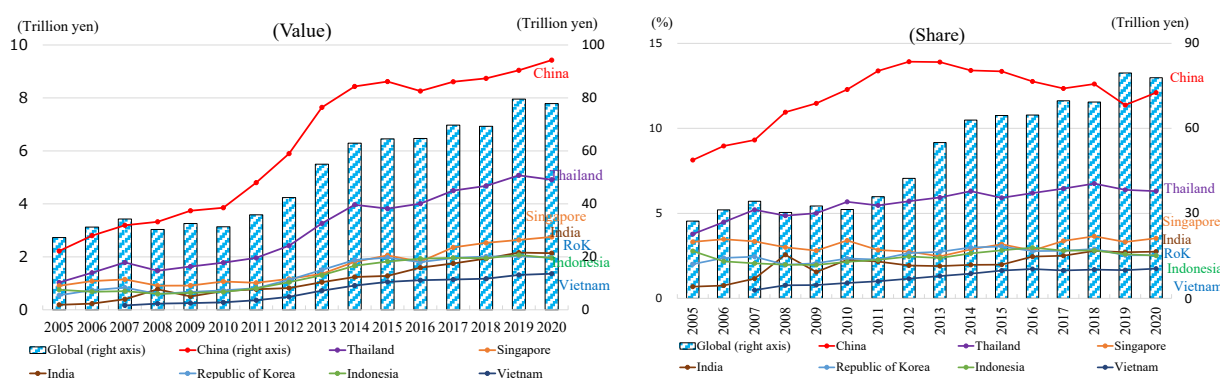
terms of share of Japan's total outstanding direct investment, China had already peaked in 2012 and has been declining since, while Thailand, India, and Vietnam have continued to rise¹⁰. Also, Singapore, the Republic of Korea, and Indonesia have stayed virtually the same.

Figure II-1-1-24. Trends in Japan's outstanding outward foreign direct investment (manufacturing sector)



Source: *International Investment Position of Japan* (Ministry of Finance).

Figure II-1-1-25. Japan's outstanding direct investment to the major Asian countries and regions (manufacturing sector)



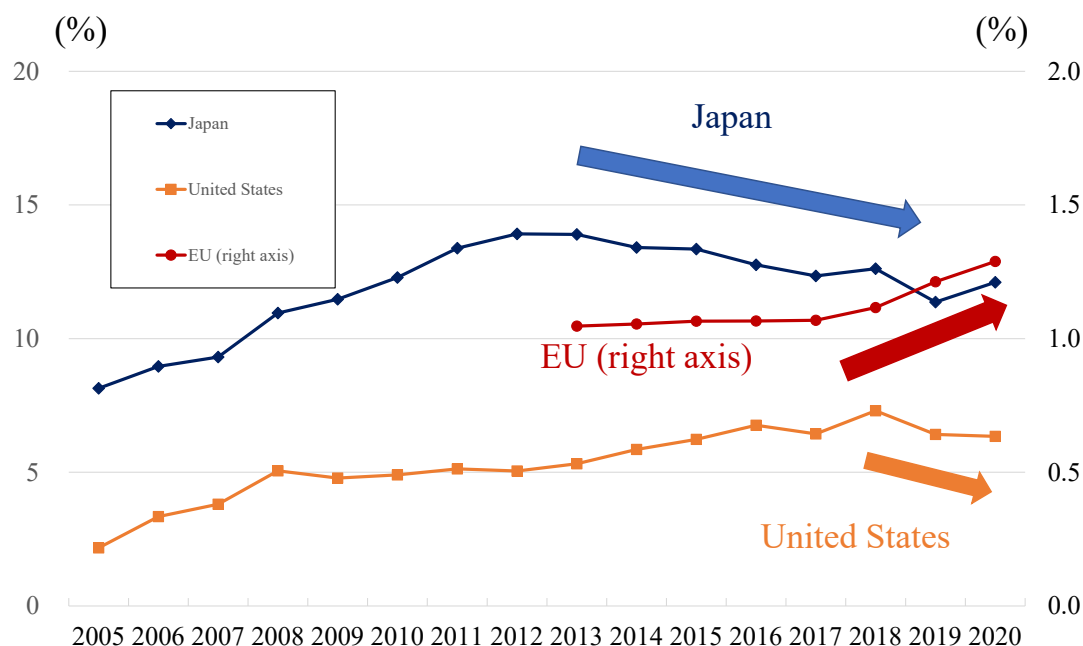
Source: *International Investment Position of Japan* (Ministry of Finance).

Source: *International Investment Position of Japan* (Ministry of Finance).

¹⁰ The outstanding direct investment figures are released in yen, but the exchange rate will affect them when local currency-denominated assets are converted into yen. It must therefore be noted that changes in the yen-based figures do not necessarily reflect the actual situation. For example, the yen depreciated from an exchange rate of about 80 yen in 2011 to one of around 121 yen (annual average) in 2015. For this reason, we have considered the size of the country's presence for Japan, by also looking its share of the global outstanding balance by country.

Looking at the trends in share in outstanding direct investment (manufacturing sector) to China by the major countries, Japan peaked in 2012 and has been declining since. Likewise, the United States peaked in 2018 and is now falling, amid the heightening trade friction between China and itself (Figure II-1-1-26). On the other hand, the EU has been growing trend in recent years.

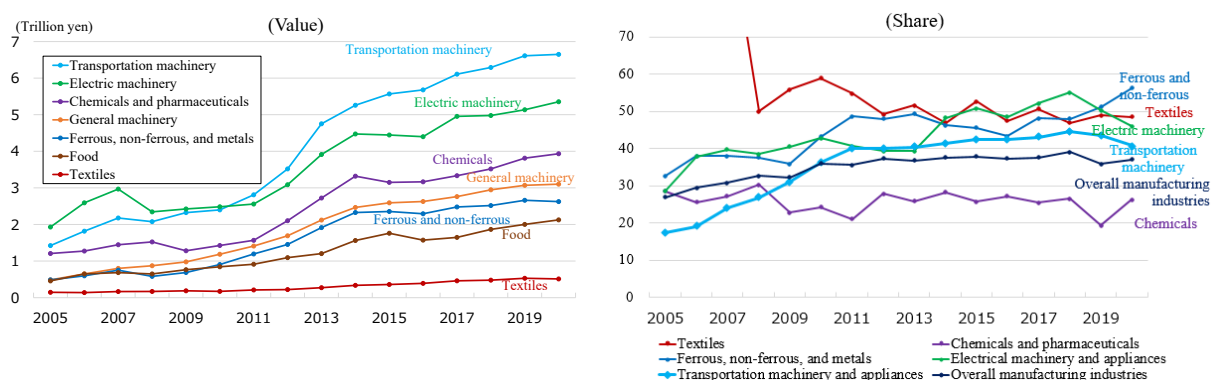
Figure II-1-1-26. Japan's, the United States', and the EU's share of outstanding direct investment to China (manufacturing sector)



Source: *International Investment Position of Japan* (Ministry of Finance), U.S. Department of Commerce Bureau of Economic Analysis, Eurostat, CEIC database.

Looking at the trends in outstanding direct investment by industry in Asia, in monetary terms, we find there has been significant growth in transportation machinery, followed by electrical machinery (Figure II-1-1-27). In addition, machinery and materials-related industries such as general machinery and chemicals have a large presence, while light industries such as textiles and food have a small one. Turning to Asia's share in the world as a whole for each industry, we see that it accounts for about 40% in the manufacturing industry, and its share in transportation machinery has been rising in particular.

Figure II-1-1-27. Trends in Japan's outstanding outward foreign direct investment by industry

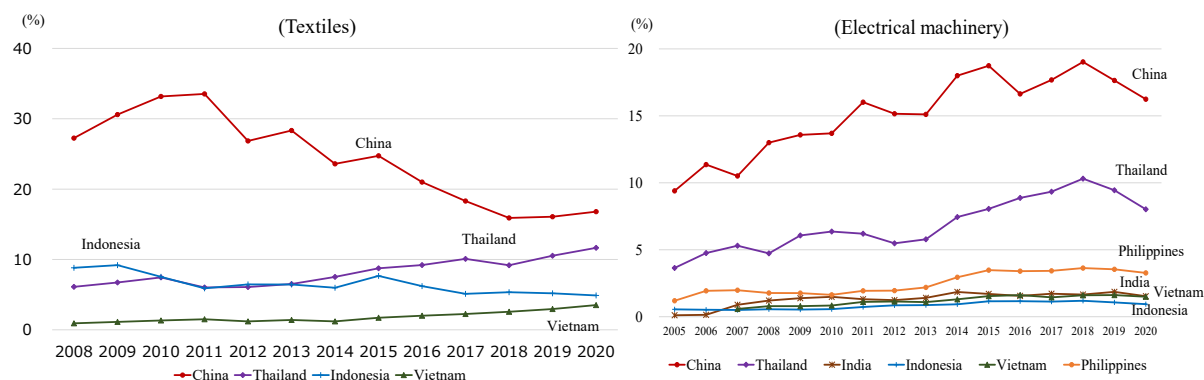


Notes: The shares are Asia's share in the total global outstanding balance for each industry

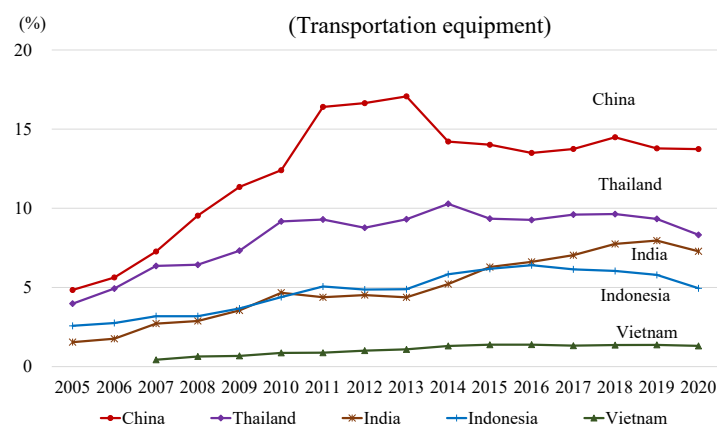
Source: *International Investment Position of Japan* (Ministry of Finance).

Looking at the trends in outstanding outward foreign direct investment based on industry-country matrices, we see that in the labor-intensive textile industry, China's share has been declining along with the rise in labor costs, and Thailand and Vietnam have been rising (Figure II-1-1-28). In electrical machinery, China and Thailand had been rising, but their trends in recent years suggest that they have peaked out. India and Vietnam are still at a low level, but rising. In transportation machinery, China, Thailand, and Indonesia have high shares, but India's has been growing rapidly.

Figure II-1-1-28. Share of Japan's outstanding outward foreign direct investment by country/region, summarized by major industry



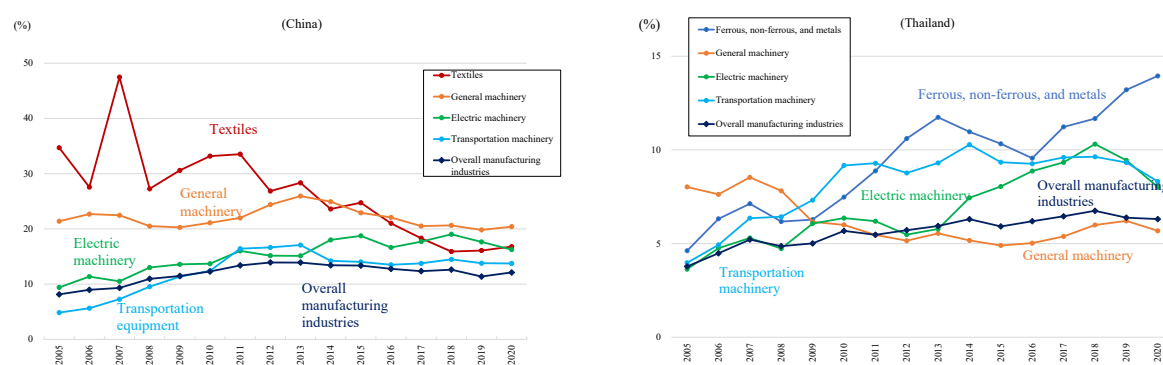
Source: *International Investment Position of Japan* (Ministry of Finance).

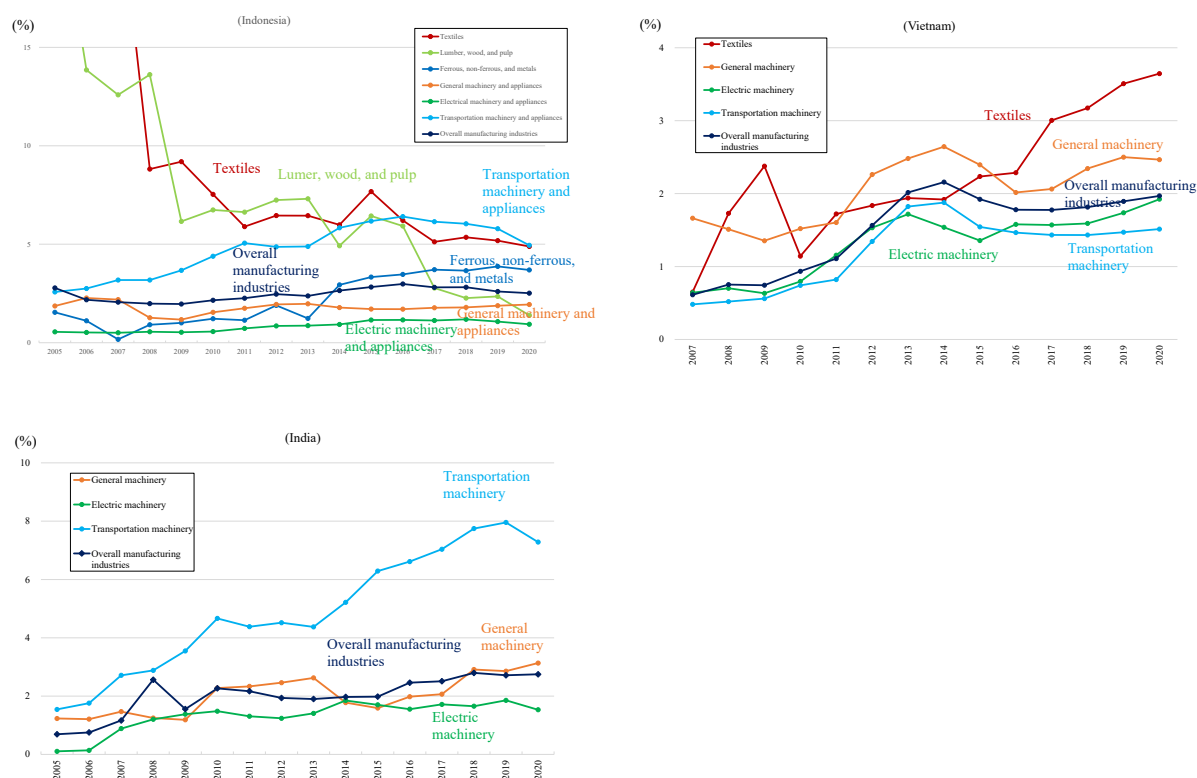


Source: *International Investment Position of Japan* (Ministry of Finance).

Figure II-1-1-29 is how the situation appears when re-summarized based on country-industry matrices. China, which has the largest outstanding direct investment, has a high share in each industry, but its share in textiles has been declining along with the rise in labor costs, and its share in machinery-related industries such as general and electrical machinery also appears to have peaked out. Thailand, which has the second largest, had a strong presence in transportation machinery, but in recent years, its share in electrical machinery and steel and nonferrous metals has also been rising. Indonesia's share is declining in light industries such as textiles and timber, but increasing in transportation machinery and steel and nonferrous metals. Vietnam's outstanding investment is still low, but is on an upward trend in the manufacturing industry as a whole. In particular, its share has increased conspicuously in the textiles sector, and has also been rising in electrical machinery in recent years. India's share in transportation machinery has increased remarkably.

Figure II-1-1-29. Share of Japan's outstanding outward foreign direct investment by industry, summarized by country





Source: *International Investment Position of Japan* (Ministry of Finance).

As we have seen thus far, Japan's outward foreign direct investment in the manufacturing industry has been used to build production bases in machinery-related industries such as transportation and electrical machinery and materials-related industries such as chemicals and steel and nonferrous metals, with the main focus being on China, Thailand, and other countries in Asia. As we will see later on, the supply chains between Japan and these production bases have been constructed, but now, rising labor costs and other economic factors, coupled with increasing geopolitical risks triggered by the friction between the U.S. and China, are causing investment to stop being concentrated toward China, and instead increasingly tend to be diversified to other countries—notable examples being Thailand, India, and Vietnam.

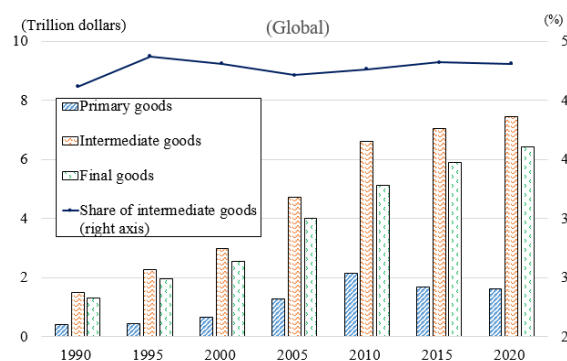
3. Trade in intermediate goods and value added

(1) Shift to trade in intermediate goods

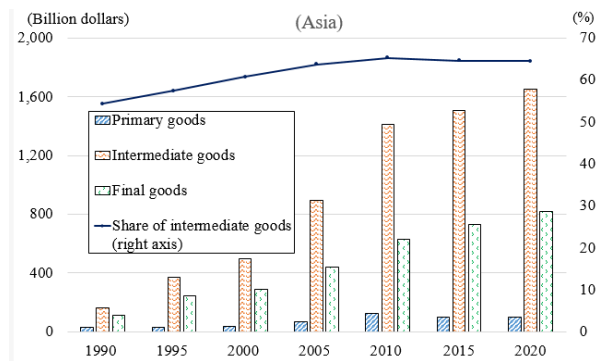
As we have already seen, world trade is shifting from the trade of final goods to that of intermediate goods, reflecting developments in international division of production. In recent years, there have been signs that the shift to intermediate goods has peaked out, being referred to as slow trade, but in Asia, where global value chains are developing, intermediate goods remain at a high level, mainly in the

machinery industry (Figure II-1-1-30).¹¹ Figure II-1-1-31 shows trade flows and shares of intermediate goods, mainly of major Asian countries. Looking at the Asian region, exports from Japan, the Republic of Korea, and Taiwan to China and ASEAN countries have a high share of intermediate goods, suggesting that there is division of production in the region. On the other hand, exports from China and ASEAN countries to Europe and the United States have a high share of final goods, suggesting that final goods are assembled and exported from those areas.

Figure II-1-1-30. Trends in world exports by goods



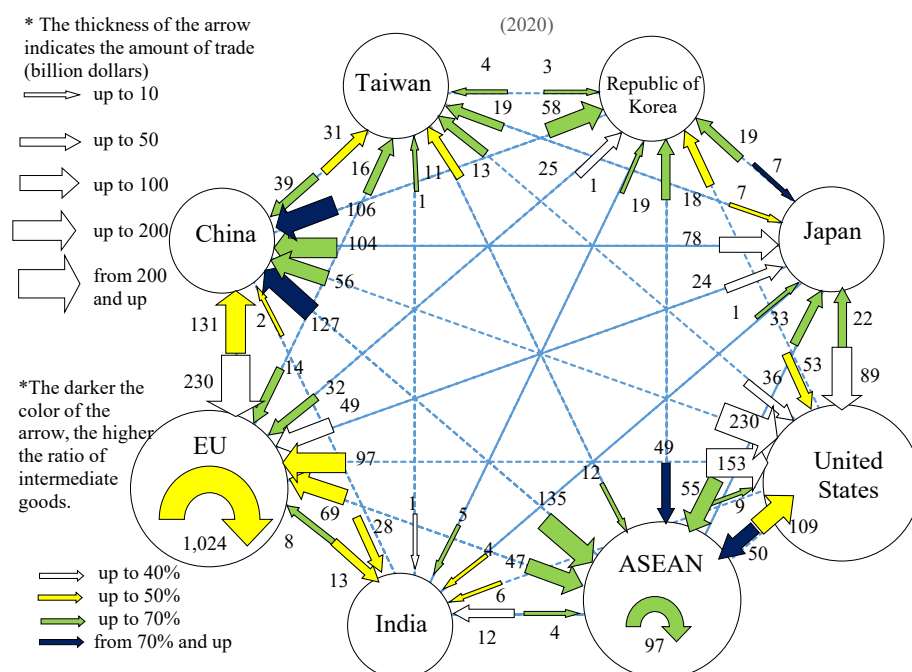
Source: RIETI-TID.



Source: RIETI-TID.

¹¹ Data from RIETI-TID is used. Due to data constraints, information in the database on Asia is based on Japan, China, the Republic of Korea, Hong Kong, Taiwan, Brunei, Cambodia, India, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. Information on ASEAN countries is based on eight countries: Brunei, Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

Figure II-1-1-31. Trade of intermediate goods in the machinery industry



Note: If the trade value is less than 1, it is indicated as 1.

Source: RIETI-TID.

(2) Trade in value added

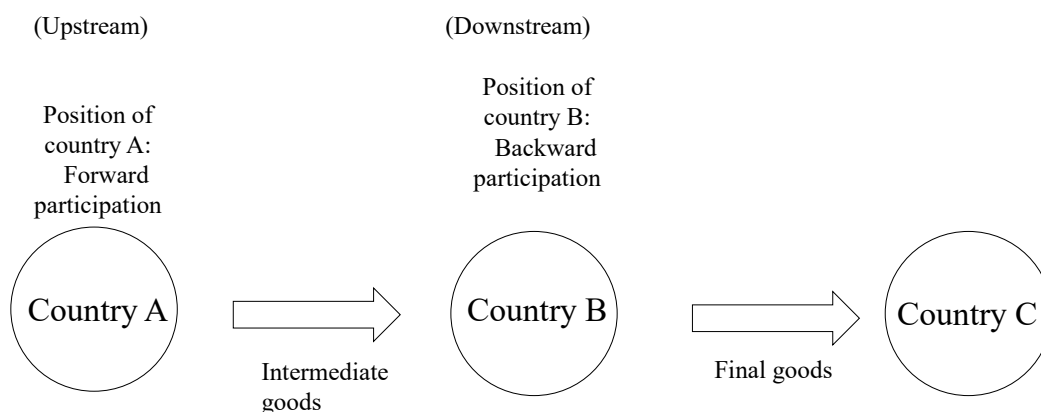
It is becoming difficult to grasp the situation surrounding the international division of production and the actual conditions of the global value chain based on it using ordinary trade statistics alone. This is because some goods contain value added components produced in other countries through the accumulation of intermediate goods. Here, we will examine the value added included in goods by country of origin and organize trade trends. For this purpose, we will use the Statistics on Trade in Value Added (OECD TiVA) compiled by the OECD.¹²

(1) Japan's global value chains and forward and backward participation

There are two cases in which a country participates in a global value chain, depending on its position. Assuming a simple global value chain as shown in Figure II-1-1-32, forward participation is when a country is located upstream in the production process similarly to country A and supplies intermediate goods to other countries. Backward participation is when a country is located downstream similarly to country B and receives intermediate goods from other countries for its own production.

¹² Here, we will analyze data from the 2021 edition of the OECD TiVA. The OECD TiVA includes trade in services as well as goods, and the 2021 edition covers from 1995 to 2018. In the context of OECD TiVA, the country of origin of value added refers to the country where production took place. For this reason, it is necessary to note that, for example, value added produced by a Japanese company located in China is recorded as being from China.

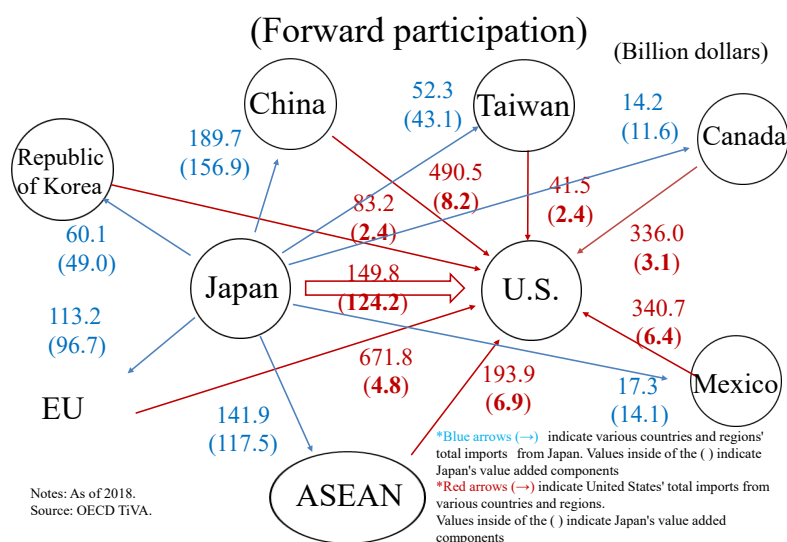
Figure II-1-1-32. Forward and backward participation in global value chains



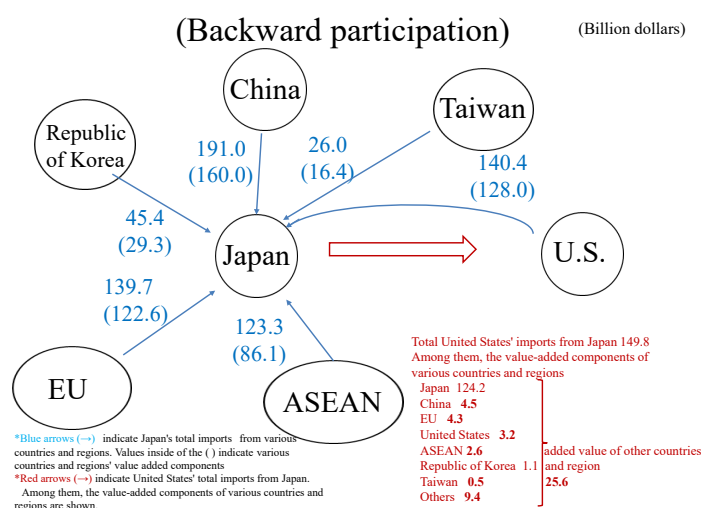
Source: Ministry of Economy, Trade and Industry.

Figure II-1-1-33 shows the total export value and Japan's value added components within exports from Japan to the United States.¹³ In the case of so-called triangular trade, which a parent company in Japan exports intermediate goods such as key components to subsidiaries in China and ASEAN countries, where the finished goods are assembled and then exported to the United States, Japan is engaging in forward participation. Exports from China and ASEAN countries to the United States include value added components produced in Japan, and the greater the value, the greater the degree of forward participation. Conversely, if intermediate goods are imported from China and ASEAN countries to Japan, where the finished goods are assembled before being exported to the United States, this is considered backward participation, and value added components from China and ASEAN countries are included in Japan's exports.

Figure II-1-1-33. Example of a global value chain involving Japan

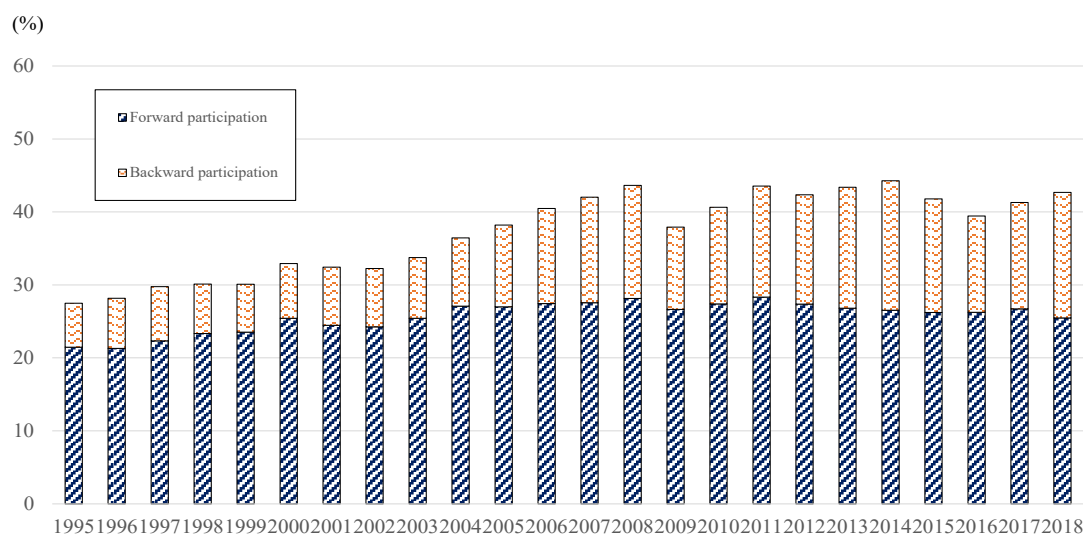


¹³ The term "export" is used here to make the explanation easier to understand, but to be accurate, the data from the OECD TiVA indicates value added from "imports."



The OECD TiVA records the degrees of forward and backward participation of a country based on the ratio of its value added to its total exports. Looking at the changes in Japan's participation in global value chains over the long term, its degree of forward participation increased moderately until the 2000s, and it has been stable at the mid-20% range since then (Figure II-1-1-34). On the other hand, backward participation has expanded rapidly since the 2000s and had nearly tripled in 2018 since 1995, the earliest year the OECD TiVA has on record.

Figure II-1-1-34. Japan's participation in global value chains



Note: Forward participation = base country's value added in total exports of other countries / total exports of the base country

Backward participation = value added of other countries in total exports of the base country / total exports of the base country

Source: OECD TiVA.

Each type of participation has different challenges. For example, one issue surrounding forward participation is that it is affected by changes in relationships between the backward participants and their trading partners, as demonstrated by the trade friction between the U.S. and China, and the resulting relocation of production bases. On the other hand, against the backdrop of the recent increase in backward participation, there are signs of companies making moves to increase efficiency. For example, in cases of intermediate goods that require intense labor or general purpose goods that do not require a high level of technology, companies can import instead of producing domestically, transfer production in Japan to departments with higher value added. However, if the supply network ceases to function effectively for any reason, such as during the COVID-19 shock, imports from forward participants will be disrupted, causing suspensions of production activities in Japan and other turmoil in the supply chain. In recent years, there have been a growing number of cases of backward participation in global value chains being a problem.

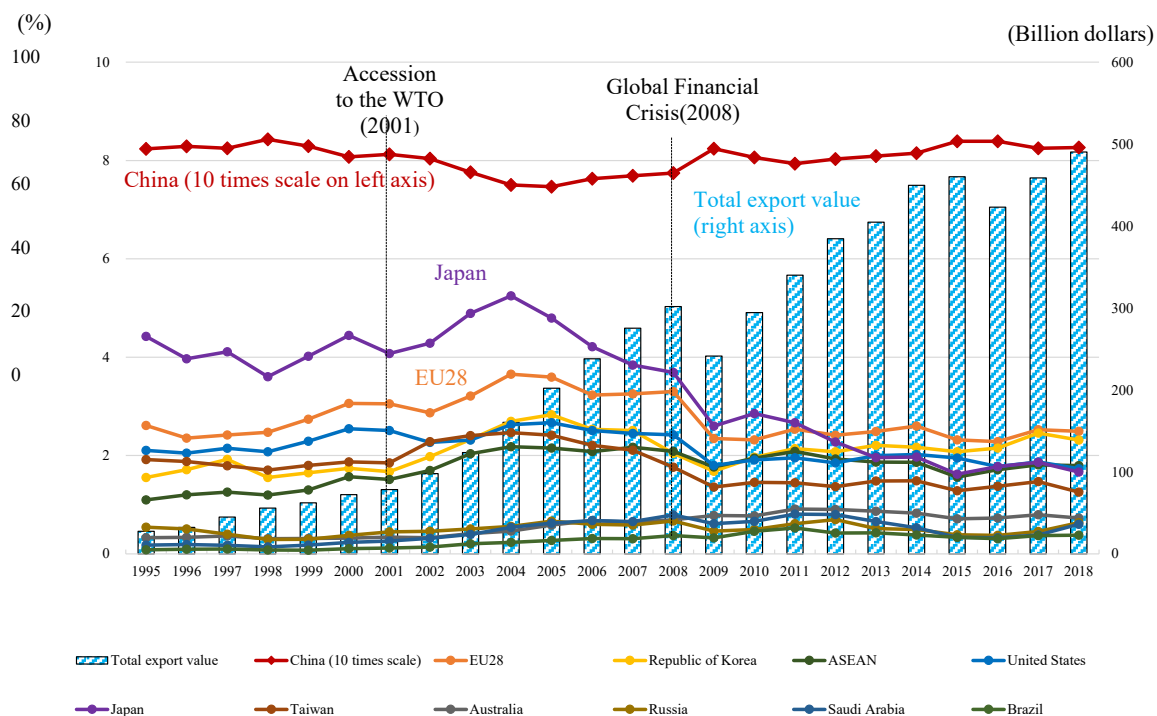
(2) Value added in China's exports to the United States

As an example, first consider a case in which Japan exports intermediate goods to China, and China exports products to the United States with Japan's value added included¹⁴. This is an example of forward participation through China and of a global factory that includes not only Japan, but major Asian and European countries and the United States.

In the value added trade analysis, it is often pointed out that the value of China's exports to the United States differs between that of ordinary trade statistics and that based on value added. As we have already seen, China imports intermediate goods from Japan, the Republic of Korea, Taiwan, ASEAN countries, and other countries and regions, and the value added components from them are included in the completed products. Figure II-1-1-35 shows trends in value added components in China's exports to the United States by country or region of origin. Looking at this, more than 80% of total exports in 2018 were made up of value added produced in China, and less than 20% were made up of value added produced outside of China. Countries and regions of origin other than China that produced value added include EU countries, the Republic of Korea, ASEAN countries, the United States, Japan, and Taiwan, as well as resource-rich countries such as Australia, Russia, Saudi Arabia, and Brazil (Figure II-1-1-36).

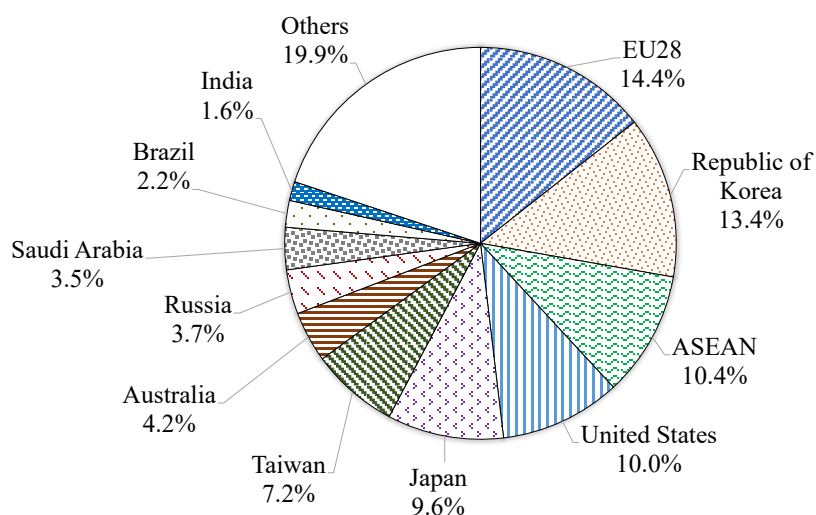
¹⁴ To be precise, this was made using data from the OECD TiVA database indicated as imports from China to the United States, but it has been expressed this way to make it easier to understand. In customs clearance statistics, exports are aggregated on a FOB basis, and imports on a CIF basis, so the values of exports and imports differ between the two countries. In the OECD TiVA, which is made from an international input-output table for goods and services, the exports on one side match the imports on the other.

Figure II-1-1-35. Share of value added of major countries and regions in China's exports to the United States



Source: OECD TiVA.

Figure II-1-1-36. Share of value added of various countries and regions in China's exports to the United States (2018)

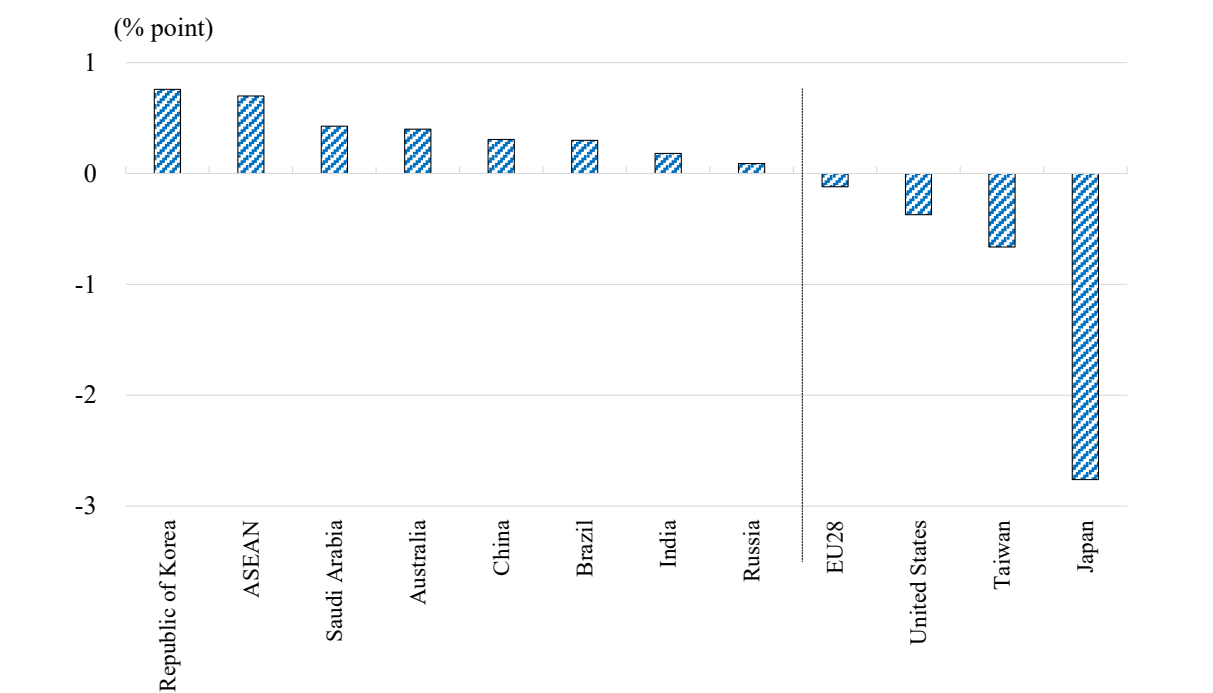


Note: Value added from China accounted for 82.7%. The figure shows figures that make up the value added for countries other than China (17.3%).

Source: OECD TiVA.

Looking at long-term changes in countries and regions of origin, the shares of value added of Japan, EU countries, and other countries increased until the mid-2000s and have been decreasing since. Looking at the degree of changes from 1995—the earliest year the OECD TiVA has on record—to 2018, we can see that Japan's and the EU's shares had been decreasing, while the shares of China, the Republic of Korea, and ASEAN countries had been increasing, (Figure II-1-1-37). The shares of resource-rich countries such as Saudi Arabia had also been increasing. The imports of core parts and other intermediate goods from Japan had increased initially, but there was a sharp decrease in Japan's share. This is thought to be related to parts suppliers—including those in Japan expanding locally—local companies improving their technology, and other factors, leading to the percentage of local procurement in China to increase¹⁵. In addition, a major factor behind the increase in ASEAN countries' shares is that even emerging countries can participate in processes depending on their level of technology in the international division of labor.

Figure II-1-1-37. Changes in shares of value added of China's exports to the United States (1995 to 2018)

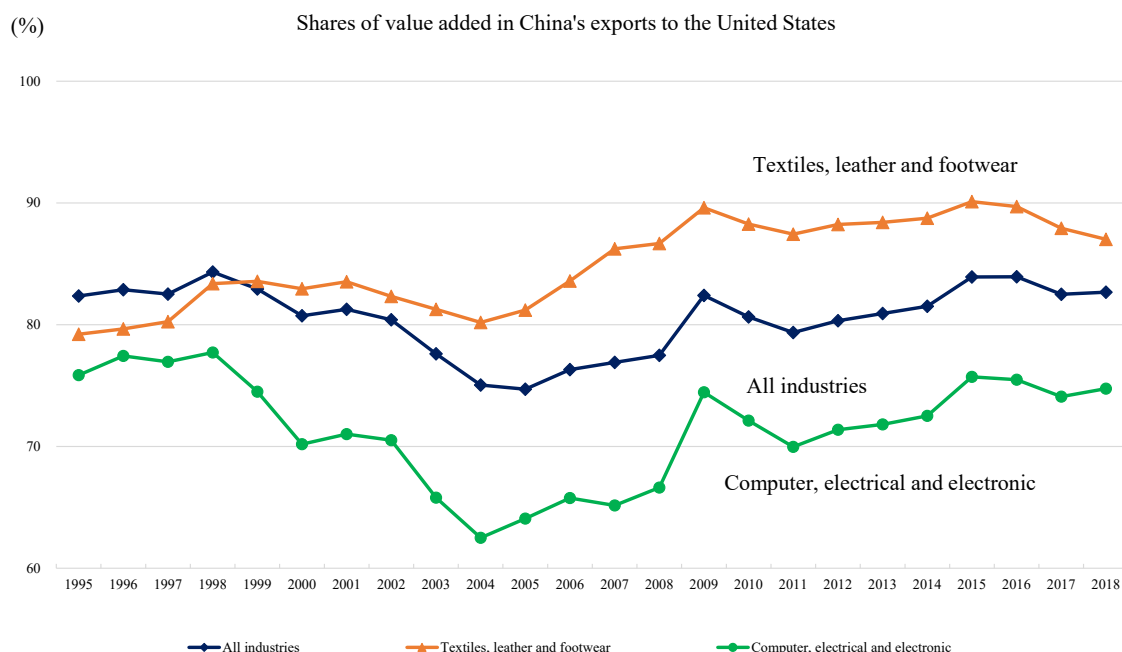


Source: OECD TiVA.

Although China's share of value added has increased overall, there are also different characteristics depending on the industry. For example, China's share of value added is higher in the labor-intensive textile industry and lower in the computer and electrical and electronic industries, which require advanced parts. The latter is considered to be due to the relatively large number of intermediate goods received from other countries (Figure II-1-1-38).

¹⁵ Other factors thought to have had an effect include difficulties in exporting from Japan due to the Great East Japan Earthquake in 2011 and the anti-Japanese movement in China following Japan's nationalization of the Senkaku Islands from 2012.

Figure II-1-1-38. Differences in China's exports to the United States by industry (value added share in China)

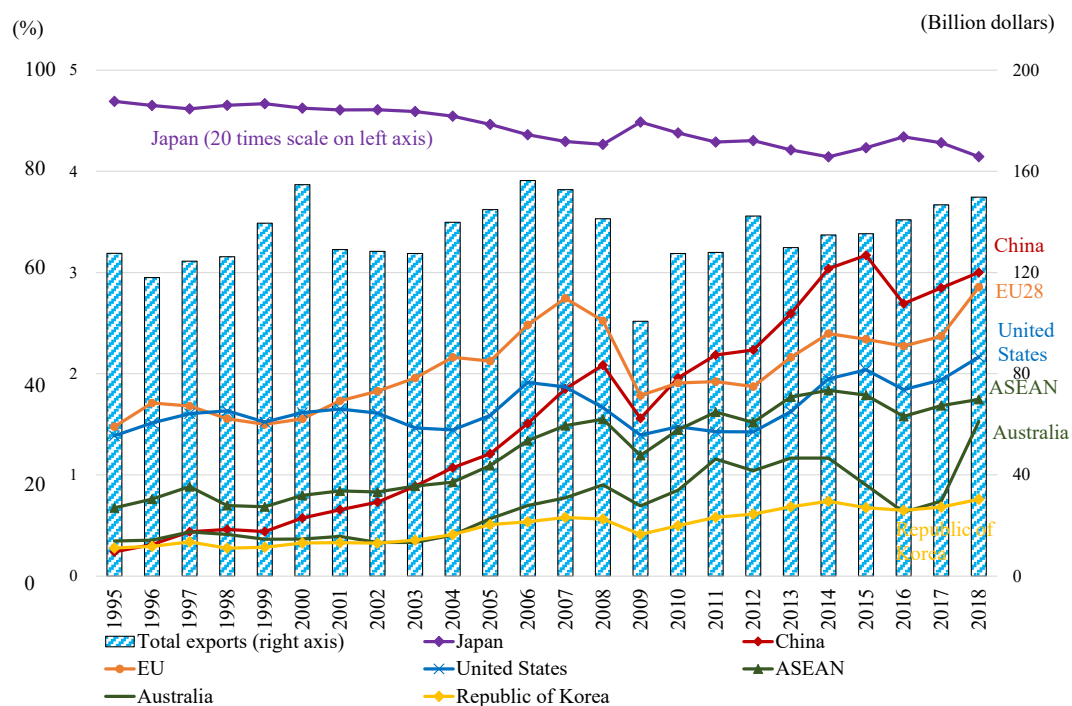


Source: OECD TiVA.

(3) Value added in Japan's exports to the United States

The Chinese exports we have seen so far were examples with Japan's forward participation. We will now look at trends in value added in Japan's exports to the United States as examples of Japan's backward participation. Figure II-1-1-39 shows the value added of each country and region included in Japan's exports to the United States, and indicates that Japan's domestic share of value added is declining moderately. On the other hand, the shares of the United States and EU countries are rising. What is more noticeable is the rapid increase of China's share. In addition, ties with the Asian region are becoming stronger, as seen by the increase in shares of ASEAN countries. As we have already seen, Japan's backward participation in global value chains is increasing. This highlights the relatively new issue of suspensions of production in Japan due to the disrupted imports of intermediate goods.

Figure II-1-1-39. Share of value added in Japan's exports to the United States of major countries and regions



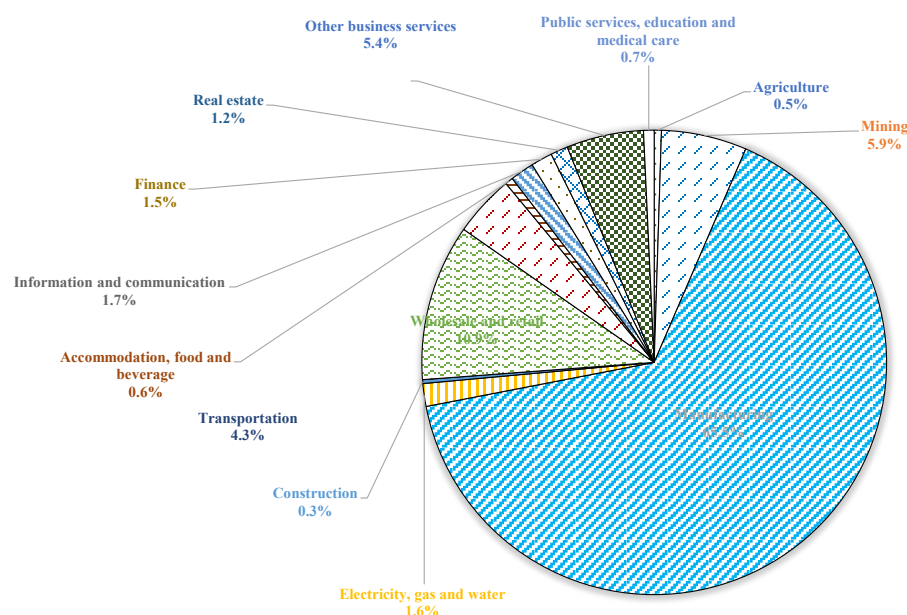
Source: OECD TiVA.

(3) Indirect trade in services embodied in trade in goods

So far, we have focused on exports of goods, but now we will look at how some goods also utilize intermediate inputs from service industries¹⁶. Figure II-1-1-40 shows the value added in exports from Japanese manufacturers classified by production industry according to the OECD TiVA. It shows that while value added from manufacturing industries account for about two thirds, agriculture and mining industries produce raw materials, which are primary commodities, while electricity, gas, and water industries produce forms of energy that are intermediate inputs. It also includes value added produced in various service areas.

¹⁶ In this context, the scope of "service industry" is according to the OECD TiVA and covers "wholesale and retail," "transportation," "accommodation and food and beverages," "information and communication," "finance," "real estate," "other business services," and "public services, education, and medical care."

Figure II-1-1-40. Breakdown of value added in exports by Japanese manufacturers by industry



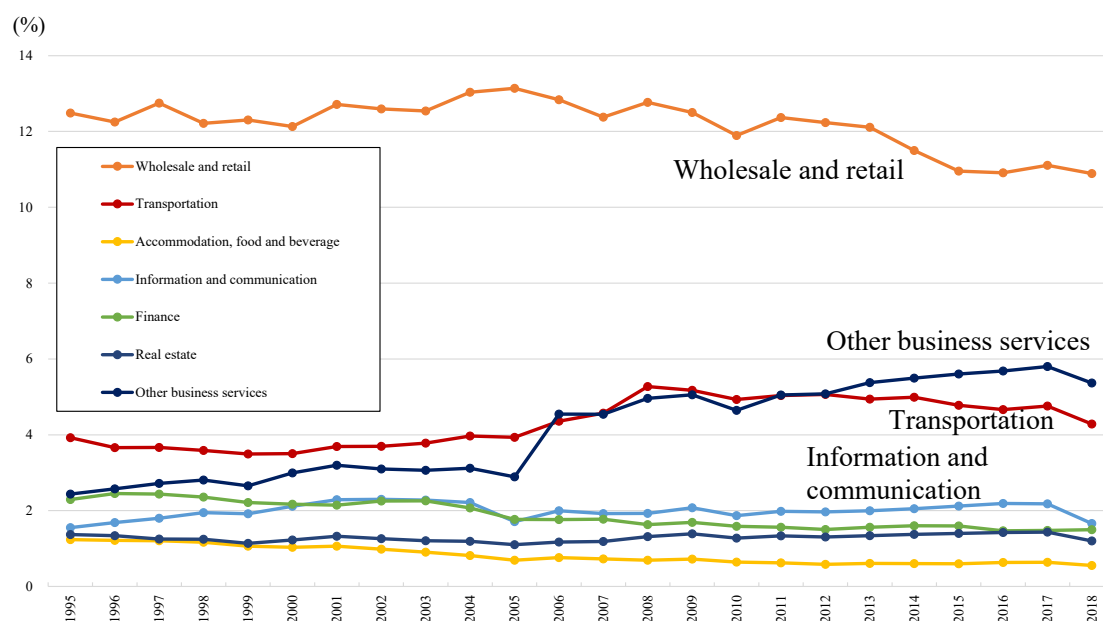
Note: 2018.

Source: OECD TiVA.

Looking at long-term changes in shares of various industries classified as services, the wholesale and retail and transportation industries have large shares, but they have been decreasing in recent years, while the share of "other business services" has been increasing (Figure II-1-1-41).¹⁷ This is in line with global trends such as the expansion of professional services including research and development and legal affairs, which we have already seen in the global trade in services. This shows that research and development activities, consultancy, legal, finance, accounting, and other activities related to trade are becoming increasingly important for increasing the sophistication and competitiveness of Japanese goods.

¹⁷ The OECD TiVA's classifications includes "professional, scientific, and technical activities" and "administrative and support services."

Figure II-1-1-41. Trends in share of value added of service areas in exports of goods by Japanese manufacturers



Source: OECD TiVA.

4. Changes in suppliers and production bases

(1) Overseas development of Japanese manufacturing industries and current situation regarding global value chains

First, we will examine the current situation regarding the overseas development of Japanese manufacturing industries. According to the Basic Survey on Overseas Business Activities by the Ministry of Economy, Trade and Industry, there are approximately 11,000 Japanese overseas manufacturing subsidiaries operating around the world (Table II-1-1-42)¹⁸. Of these, about 8,700 companies, or about 80%, are in Asia, many of them in China and ASEAN countries. In terms of industry, many of them are related to areas such as machinery (e.g., transportation machinery, general machinery, information and communication electronics equipment, electric machinery), steel, metals, and chemicals.

¹⁸ The "Basic Survey on Overseas Business Activities" is a survey of Japanese companies with overseas subsidiaries (excluding finance, insurance, and real estate). In this context, "overseas affiliates" is a general term for overseas subsidiaries and sub-subsidiaries. An overseas subsidiary refers to a foreign corporation with a Japanese investment ratio of 10% or more, and an overseas sub-subsidiary to a foreign corporation with an investment ratio of more than 50% from an overseas subsidiary with a Japanese investment ratio of more than 50%. The recovery rate was 73.8% (survey of FY2019 results).

Table II-1-1-42. Number of Japanese overseas manufacturing affiliates (FY2019)

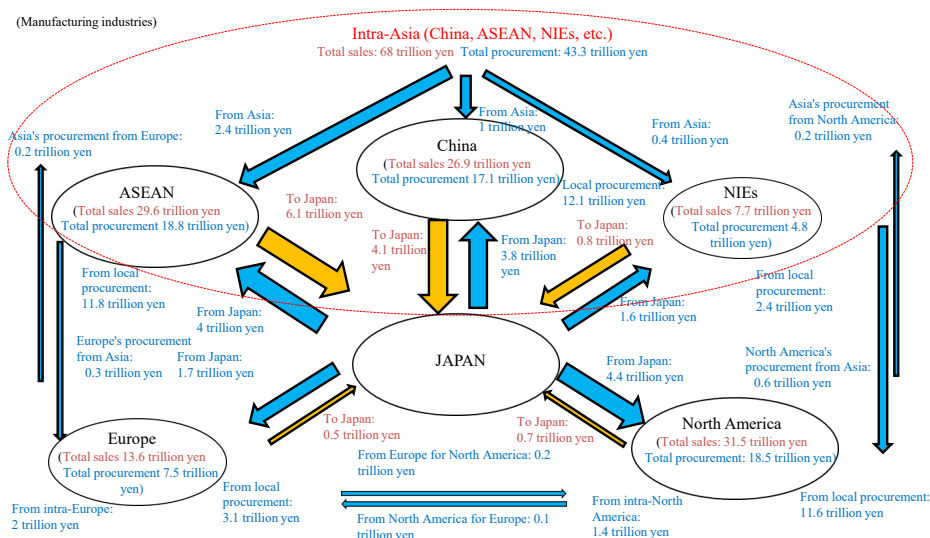
	World	The United States	Asia	China	ASE-AN10	Europe
All industries	25,693	3,038	17,372	6,430	7,312	2,803
Manufacturing	11,199	1,074	8,652	3,744	3,635	843
Food	528	79	356	154	156	49
Textiles	468	9	433	258	148	16
Chemicals	1,085	121	802	304	320	116
Steel and metals	1,326	93	1,123	452	535	43
General machinery	1,713	177	1,294	613	448	174
Electric machinery	677	53	558	296	186	43
Information and communication electronics equipment	972	79	804	343	312	63
Transportation equipment	2,398	315	1,619	601	799	208

Note: The value for "steels and metals" is the sum for steels, non-ferrous metals and metal products, and the value for "general machinery" is the sum for general-purpose machinery, production machinery, and business-oriented machinery.

Source: "Basic Survey on Overseas Business Activities" (Ministry of Economy, Trade and Industry).

Figure II-1-1-43 shows procurement flows between production bases of Japanese manufacturing industries. Looking at this, there are reciprocal procurement flows between Japan, China, ASEAN and NIEs in Asia. In particular, materials from Japan and other Asian regions are flowing into China and ASEAN countries. We have already seen that China and ASEAN countries are attracting intermediate goods from Asia in the context of global trade, and we can see a similar trend in Japanese manufacturing industries' procurement networks. There is also procurement between Asia and other regions such as North America and Europe, although on a limited scale. As seen in the beginning of this section, there is a large amount of short-distance trade due to transportation costs, which is consistent with the increase percentage of intra-regional trade.

Figure II-1-1-43. Locations and procurement of Japanese manufacturing industries (FY2019)¹⁹



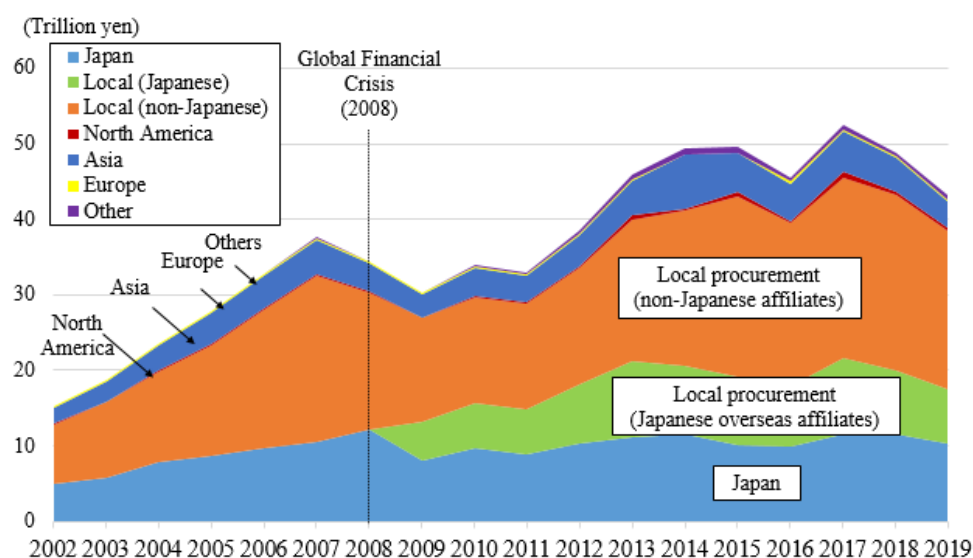
Source: "Basic Survey on Overseas Business Activities" (Ministry of Economy, Trade and Industry).

(2) Characteristics of and long-term changes in Japanese manufacturing industries' procurement activities

Looking at long-term changes in procurement activities of Japanese manufacturing industries in Asia, it shows that although procurement from Japan has remained at a certain amount, the amount of local procurement, including that from Japanese companies that had expanded into the region, is gradually increasing accordingly (Figure II-1-1-44). It has been pointed out that this is due to Japanese component suppliers, as well as final assemblers, expanding locally, and to the progressing guidance to local companies and their expansion.

¹⁹ The "Basic Survey on Overseas Business Activities" reports the results for the fiscal year adopted by each overseas affiliate. For this reason, there may be differences in the fiscal year for each affiliate until December and until March.

Figure II-1-1-44. Suppliers of Japanese overseas manufacturing subsidiaries located in Asia

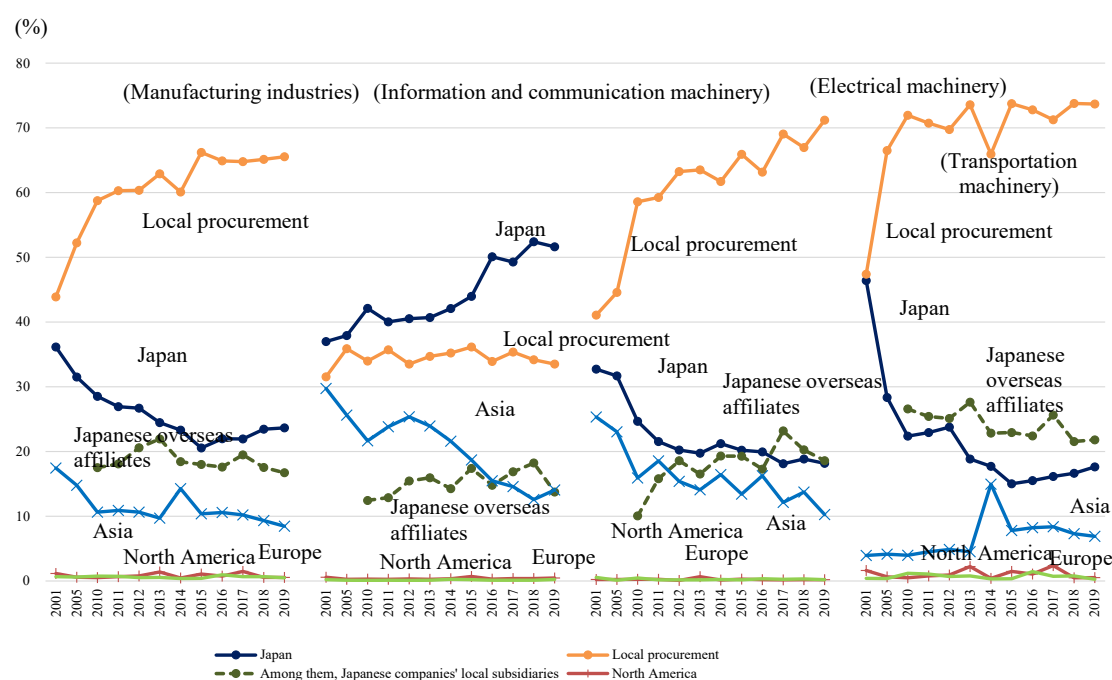


Note: The survey on local procurement from Japanese overseas affiliates began in FY2009.

Source: "Basic Survey on Overseas Business Activities" (Ministry of Economy, Trade and Industry).

As a result, the share of the total amount of procurement accounted for procurement from Japan is decreasing, and the percentage of local procurement is increasing (Figure II-1-1-45). Industries also have different procurement characteristics. While Japan has a high percentage of procurement of information and communication equipment, the industry for automobiles, which are representative of transportation equipment, has a strong tendency to place parts suppliers around assembly plants, and the percentage of local procurement is high. One reason behind this difference is differences in transportation costs depending on the weight of the components. Products' characteristics also have an impact, such as whether they are integral—as with automobiles—and require communication and adjustments between companies if there is a problem, or whether they are modular—as with information and communication equipment—and require relatively no communication or adjustments because of standardization. In addition, in the case of information and communication machinery, it is thought that another factor is whether or not there are core parts with high value added that cannot be produced locally (e.g., those with advanced electronic components). The previous analysis on value added showed that the industries for computer and electrical and electronic products in China have relatively low domestic value added, and it is difficult to produce core parts domestically.

Figure II-1-1-45. Suppliers of Japanese manufacturing subsidiaries in Asia by industry



Note: Local sales/procurement also include Japanese overseas affiliates.

Source: "Basic Survey on Overseas Business Activities" (Ministry of Economy, Trade and Industry).

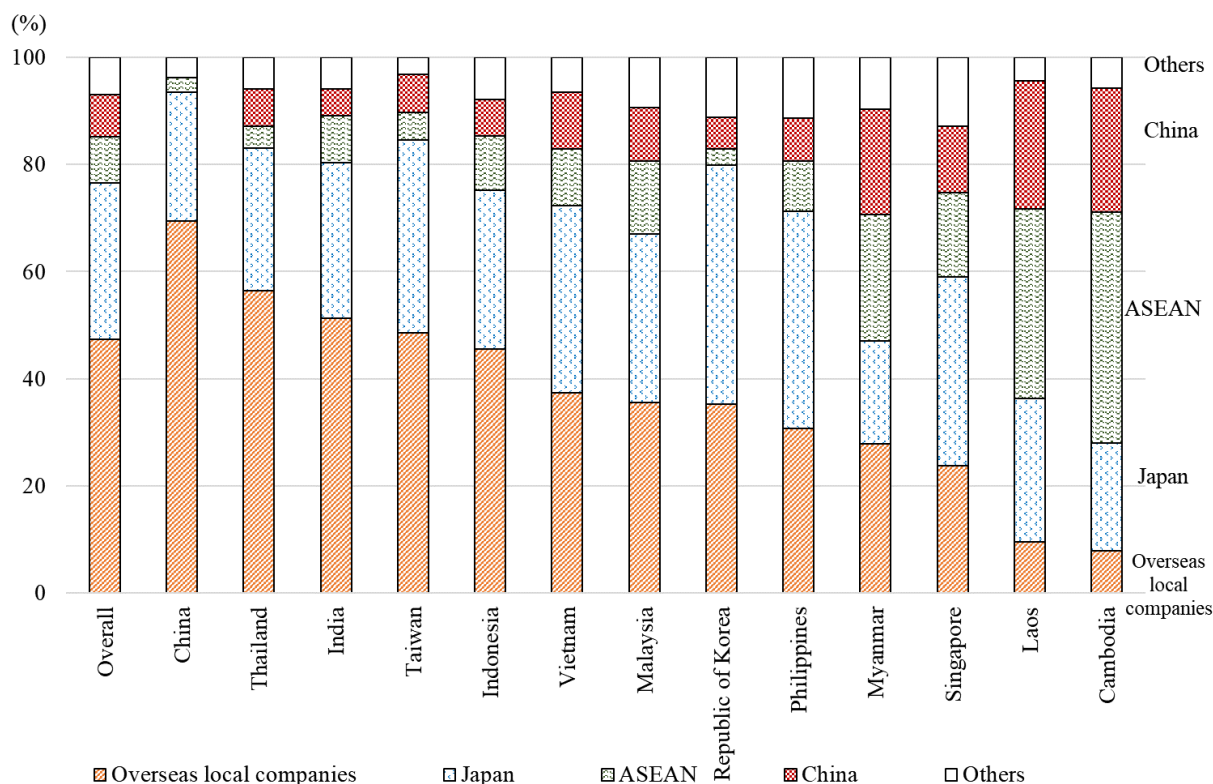
(3) Recent trends in procurement and other processes, and direction of reviews

(1) Suppliers

We will look at recent trends in procurement and location, and the direction of their reviews. According to a survey by JETRO on Japanese companies located in Asia and Oceania, about 50% of procurement is local, about 30% is from Japan, and the rest is from ASEAN countries, China, and other countries (Figure II-1-1-1-46).²⁰ By country and region, China has the highest percentage of local procurement, followed by Thailand. It is suggested that Japanese companies, local companies, and other related companies are forming industrial clusters in these countries. On the other hand, Cambodia and Laos have low local procurement percentages, indicating that local related industries there are immature. Hence, those countries have a high percentages of procurement from other ASEAN countries and from within Asia, such as China, in the case of countries that share a border with it. The biggest destinations of procurement from Japan are the Republic of Korea, Taiwan, the Philippines, and Singapore, from highest to lowest.

²⁰ FY 2021 Survey on Business Conditions of Japanese Companies Operating Overseas (Asia and Oceania) (JETRO). This is a survey on Japanese companies operating in Asia and Oceania. Since the respondents may not be the same as in the "Basic Survey on Overseas Business Activities" by the Ministry of Economy, Trade and Industry, the values in the survey results are different. However, they are provided here in order to examine trends since there is a breakdown by country, data up to the most recent date available, a study on future policies, and other information.

Figure II-1-1-46. Suppliers of raw materials and parts for Japanese companies in major countries in Asia and Oceania



Note: Only responses from manufacturers are used.

Source: "FY 2021 Survey on Business Conditions of Japanese Companies Operating Overseas (Asia and Oceania)" (JETRO).

The survey also studies future reviews of procurement and other information in relation to supply chains, and more than 20% of companies said they plan to review their procurement (Table II-1-1-47).²¹ Regarding the content of the review, more than 80% of the companies that plan to review cited "review of suppliers" and more than 50% cited "adoption of multiple procurement sources," indicating that they are seeking appropriate suppliers and diversifying them. The reasons behind them include rising production costs due to global supply constraints as seen in Part I. The biggest reason cited was cost optimization, followed by the spread of COVID-19 and changes in the trade environment²².

²¹ In general, a global value chain covers a wide range including planning, R&D, manufacturing, sales, and maintenance, while a supply chain often refers mainly to the supply chain of raw materials and products in the manufacturing process. This section does not make a strict distinction between the two. Here, we refer to supply chains as indicated in the research report.

²² The reasons for reviewing change depending on the circumstances at the time. For example, there was a similar item in the FY2020 survey, but the number one reason for reviewing suppliers was the spread of COVID-19 (29.4%), followed by changes in the trade environment (e.g., imposition of additional tariffs) at 22.6%. When the FY2019 survey was conducted, changes in the trade environment had been garnering attention, and although the form of questions was different, about 10% of companies responded that they had changed suppliers because of changes in the trade environment. This shows that companies take measures in response to the situation at the time.

Table II-1-1-47. Review of procurement of Japanese companies located in Asia and Oceania

(Plan to review)	
Review of procurement (4,474 respondents)	Planned 21.6%
Content of review (multiple responses)	
• Review of suppliers 85.3%	
• Adoption of multiple procurement sources 53.9%	
• Promotion of digitalization 17.3%	
(Reason for review)	
Reason	Response rate
Optimization of production costs	67.7%
Spread of COVID-19	34.2%
Changes in the trade environment	10.8%
Tighter environmental regulations	9.4%
Other	18.6%

Note: Non-manufacturing industries such as trading companies and wholesale are included in addition to manufacturing industries.

Source: "FY 2021 Survey on Business Conditions of Japanese Companies Operating Overseas (Asia and Oceania)" (JETRO).

Looking at switches in suppliers, procurement from Japan was cited the most frequently by companies in terms of number of cases to be reviewed, and many of those companies switched to local procurement. There are also companies that switched to procurement from China or ASEAN countries (Table II-1-1-48).²³ The second most cited source was China, with companies switching to procuring from ASEAN countries or Japan, or to local procurement. Overall, there is a decrease in procurement from Japan and increase in procurement from local or ASEAN sources instead. There is both an increase and decrease in procurement from China, and a large change is not expected as a result.

Table II-1-1-48. Changes in suppliers of Japanese companies located in Asia and Oceania

		(Unit: cases)					
		After change					
Before change	Local country/Region	Local country/ region	Japan	China	ASEAN	Taiwan	Total
	Japan	68	11	35	25	9	169
	China	14	11		19	6	74

²³ JETRO has conducted surveys on Japanese companies operating overseas, the results of which are published in several reports. The FY 2021 Survey on Business Conditions of Japanese Companies (Global edition) contains cross-regional information, the FY 2021 Survey on Business Conditions of Japanese Companies (Asia and Oceania), on Asia and Oceania, and the FY 2021 Survey on Business Conditions of Japanese Companies (China), on specifically China.

	ASEAN	7	7	9	9	0	35
	Taiwan	0	0	0	0		9
	Total	98	40	62	75	19	

Note: The total includes countries and regions other than local, Japan, China, ASEAN countries, and Taiwan.

Source: "FY 2021 Survey on Business Conditions of Japanese Companies (Global edition)" (JETRO).

So far, we have been shown results of surveys on Japanese overseas affiliates, but a similar trend was observed in a survey conducted by JETRO on Japanese companies (headquarters) that are interested in overseas business²⁴. It is worth noting that more than 20% of companies responded that they would review their procurement, a higher percentage in the FY2021 survey than in the FY2020 survey, although their target areas were not specified from the standpoint of the headquarters. Regarding procurement, an increasing number of respondents answered they were going to switch suppliers or adopt multiple procurement sources, indicating that they are seeking appropriate suppliers and diversifying them.

(2) Production bases

The survey by JETRO on Japanese companies in Asia and Oceania covers reviews of production bases. Less than 20% of respondents had plans to review them (Table Figure II-1-1-49). Against the backdrop of increased orders, production cost optimization, and other factors, a high percentage of those that planned to review were going to review increases in new investment or capital investment and promotion of automation and labor saving, and one fourth of them were going to review production bases.

Table Figure II-1-1-49. Review of production of Japanese companies in Asia and Oceania

(Plan to review)	
Review of production (4,456 respondents)	Percentage of respondents with plans to review
	17.2%
Content of review (multiple responses)	
• Increase in new investment/capital investment	63.8%
• Promotion of automation/labor saving	41.6%
• Review of production sites	27.1%
• Promotion digitalization	21.9%

²⁴ *Questionnaire Survey on Overseas Business Operations by Japanese Companies* (JETRO). Both the FY2020 and FY2021 survey asked questions about procurement reviews and other issues.

(Reasons for review)	
Reason	Response rate
Optimization of production costs	57.1%
Spread of COVID-19	11.1%
Tighter environmental regulations	10.4%
Changes in the trade environment	4.1%
Other (e.g., response to increased orders, business expansion)	37.3%

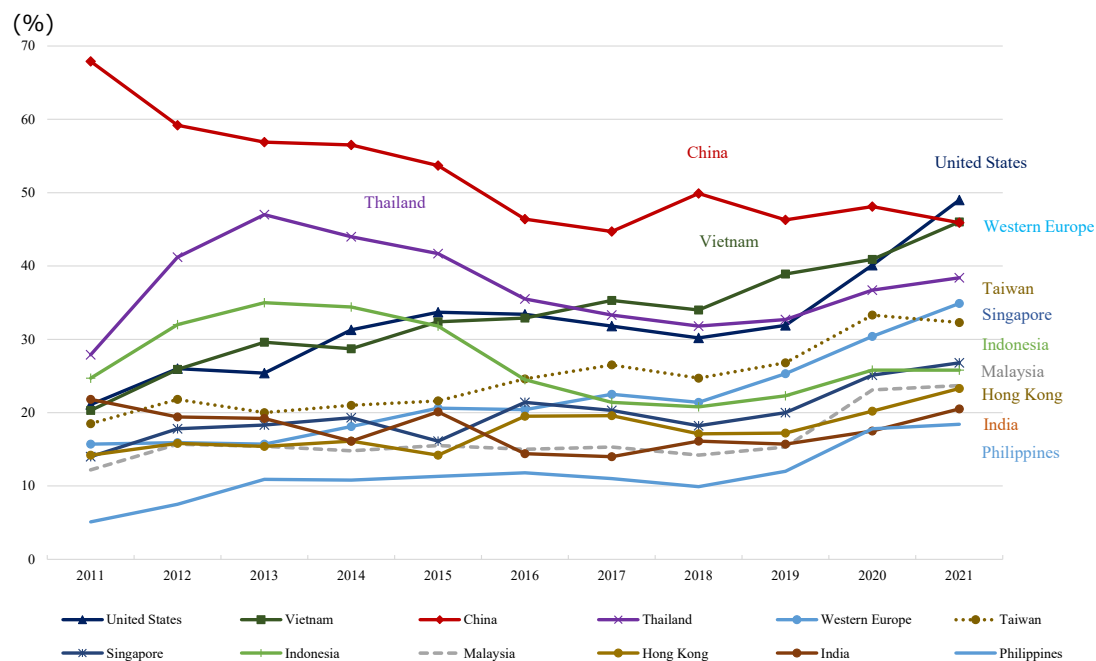
Note: Non-manufacturing industries such as trading companies and wholesale are included in addition to manufacturing industries.

Source: "FY 2021 Survey on Business Conditions of Japanese Companies Operating Overseas (Asia and Oceania)" (JETRO).

JETRO conducted a survey on companies (headquarters) in Japan and the countries and regions to which they are expanding, the results of which are in Figure II-1-1-50²⁵. In China, risks such as those related to rising wages and trade friction with the United States have been pointed out. Although expansion in China has declined since the beginning of the 2010s, it has remained at an almost constant level of little below 50% in recent years. In addition, the United States, Vietnam, and Thailand had among the highest levels. According to a survey by the Japan Bank for International Cooperation (JBIC) on promising investment destinations for domestic companies, China's level had been declining for a long period of time, but it has remained at a certain level in recent years. The United States, Vietnam, and Thailand are also promising, and India also has a high level (Figure II-1-1-51).

²⁵ There are differences in each year's detailed counts. The values for 2011 and 2012 are counts of companies that answered with "new investment or expansion of a business that already exists overseas," for 2013 to 2015, "currently have a base overseas and plan to expand it further," for 2016 and onward, "currently have a base overseas and plan to expand it further," or "currently do not have a base overseas but want to newly expand in the future."

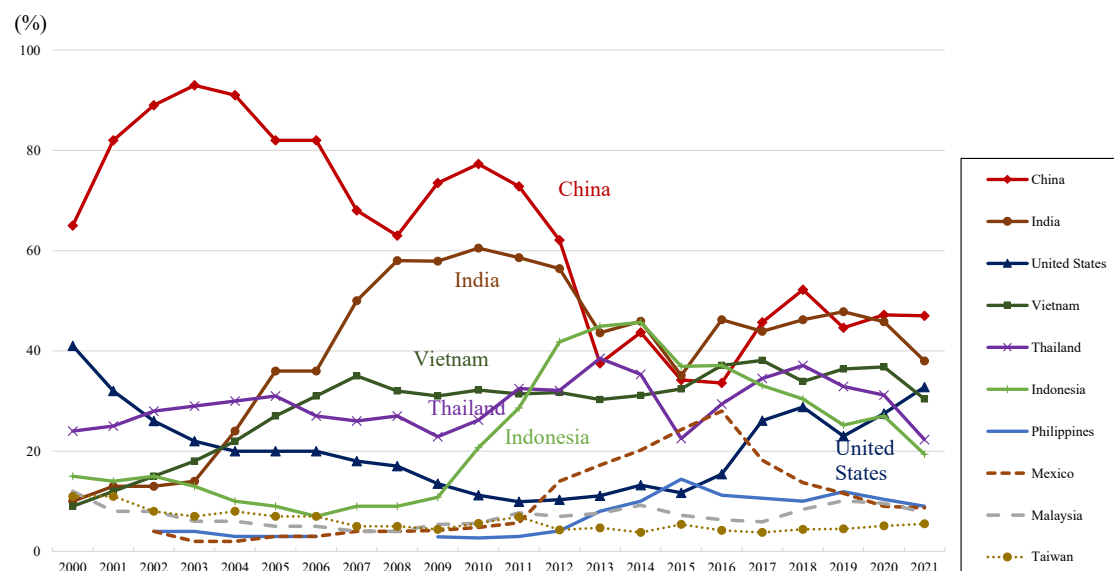
Figure II-1-1-50. Countries and regions which companies are expanding to (Target: all industries)



Note: The top countries and regions in 2021 are shown.

Source: "Questionnaire Survey on Overseas Business Operations by Japanese Companies (FY 2019, FY 2021)" (JETRO).

Figure II-1-1-51. Promising countries and regions for companies to expand to in the medium term (next 3 years)



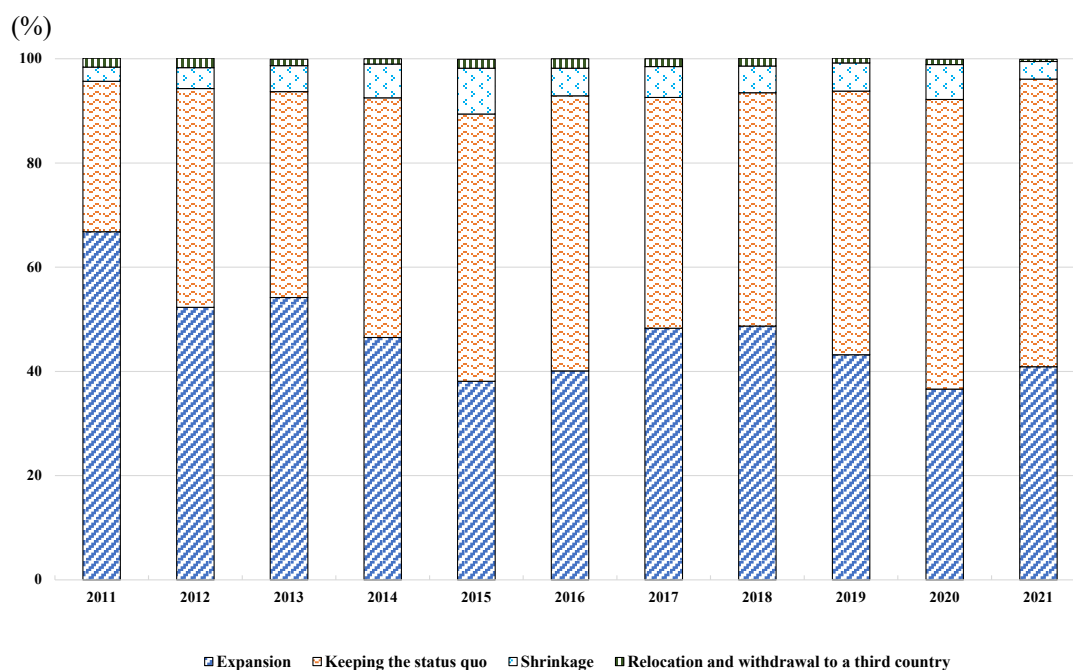
Note: The top 10 countries and regions in 2021 by percentage of votes are shown. Percentage of votes = number of votes for the country or region / number of respondents to the question.

The question was "Countries you consider to be promising for expanding to in the medium term (next 3 years)" (up to 5 responses possible).

Source: "Survey Report on Overseas Business Operations by Japanese Manufacturing Companies" (multiple editions) (Japan Bank for International Cooperation).

In a survey on Japanese companies in China on the direction of their business expansion, more than 90% of respondents answered that they maintained the status quo or expanded over the past ten years, less than 10% shrank, and a very small number of respondents said that they moved to a third country or withdrew (Figure II-1-1-52). There are many challenges in China, such as changes in the trade environment, increasing wages and production costs, and growing competition, but it shows that it is attractive as a promising market from companies' perspectives.

Figure II-1-1-52. Direction of business expansion over the next one to two years (Japanese companies in China/all industries)



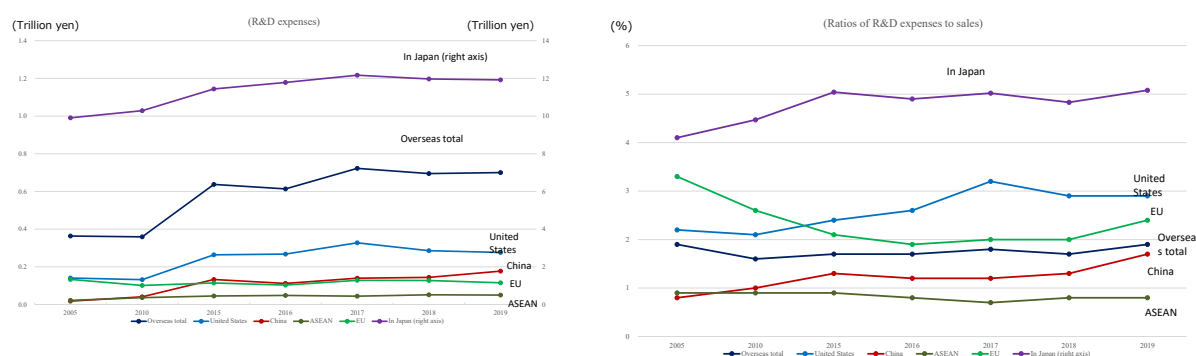
Source: "Survey on Business Conditions of Japanese Companies Operating Overseas (China)" (multiple editions) (JETRO).

(4) Research and development

So far, we have focused on procurement and production. Next, we will look at how companies' R&D activities are expanding as local production becomes more advanced. We will compare trends in R&D expenses of manufacturers in Japan and those of Japanese overseas manufacturing affiliates, using data from the Basic Survey of Japanese Business Structure and Activities and Basic Survey on Overseas Business Activities by the Ministry of Economy, Trade and Industry²⁶. While R&D expenses of manufacturing companies in Japan have been growing moderately, R&D expenses of overseas manufacturing affiliates have nearly doubled in terms of value since 2005 (Figure II-1-1-53). Looking at ratios of R&D expenses to sales, those of affiliates in the United States have been increasing, and those of affiliates in China are still at low levels but are increasing gradually.

²⁶ The Basic Survey on Business Activities covers companies with 50 or more employees and capital of 30 million yen or higher. Although it may not cover all manufacturing firms, it can be used to observe trends through time series.

Figure II-1-1-53. Trends in R&D expenses of manufacturing companies



Source: "Basic Survey of Japanese Business Structure and Activities," "Basic Survey on Overseas Business Activities" (Ministry of Economy, Trade and Industry).

Source: "Basic Survey of Japanese Business Structure and Activities," "Basic Survey on Overseas Business Activities" (Ministry of Economy, Trade and Industry).

5. Vulnerabilities in global value chains

(1) Indirect trade

So far, we have thought about international value chains between countries and regions, but value chains are also expanding in Japan. For example, a company that is not directly involved in exports may still be indirectly involved in them by providing materials to other manufacturers that use the materials for products that are then exported. A company also takes part in an international value chain when it procures intermediate products made of imported materials from another manufacturer and uses them to assemble its own products, even if it does not import the materials directly. In addition, there may be cases in which a company does not have knowledge of trade procedures or information on overseas trading partners, and is connected overseas by simply dealing with trading companies and other wholesalers in Japan, even the company is not engaged in imports or exports.

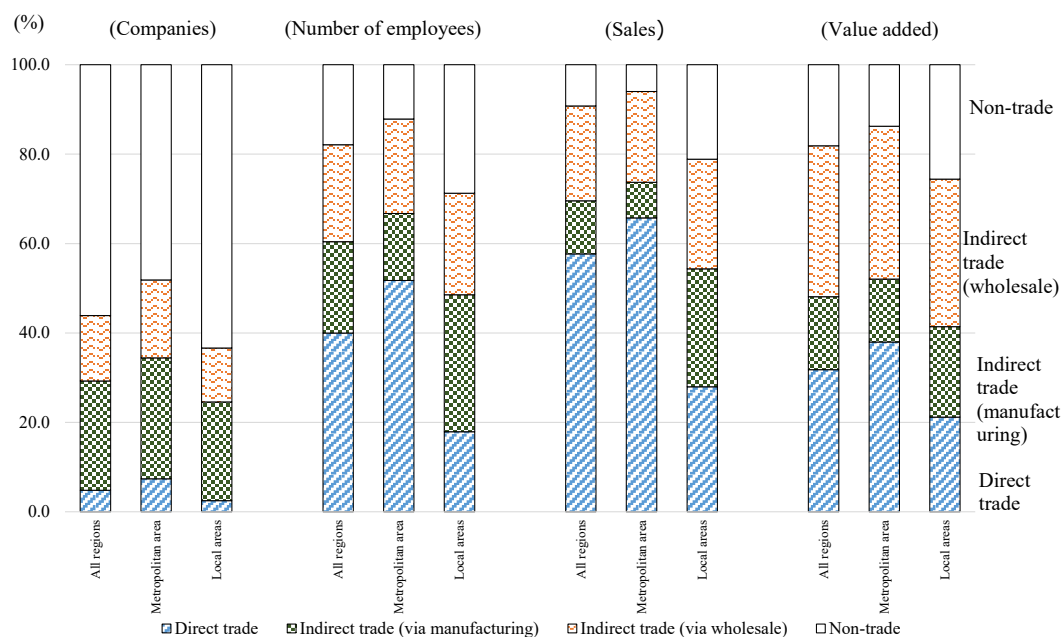
These companies are also linked to global value chains, but it is difficult to accurately grasp to what extent. We will now look at shares of manufacturing companies engaged in indirect trade using Ishikawa, Saito, and Taoka (2017) as a guide²⁷. Using data on corporate transactions from TOKYO SHOKO RESEARCH, the paper analyzes indirect trade, assuming that manufacturers can be classified as indirect exporters or importers, if they deal with the other manufacturers or wholesalers that are engaged in direct exports and imports²⁸. The values in Figure II-1-1-54 shows the wide scope of manufacturing companies engaged in indirect trade. For example, in all of Japan, about 40% of manufacturing companies and workers in manufacturing companies are engaged in indirect trade, and

²⁷ Ishikawa, Saito and Taoka (2017), "Indirect Trade in Regional Economies" (RIETI Policy Discussion Paper Series 17-P-009).

²⁸ Although this definition is adapted to data constraints, it should be noted that, in practice, products made with materials from the manufacturer are not necessarily exported, and materials imported from trading partners are not necessarily used in the manufacturer's production activities.

about 30% of sales and 50% of value added come from indirect trade. Comparing metropolitan and rural areas, companies engaged in direct trade have a larger share in metropolitan areas, while companies engaged in indirect trade have a larger share in rural areas in terms of number of workers, sales, and value added.²⁹ Companies that appear to be unrelated to trade are also indirectly linked to global value chains. This trend is particularly true in rural areas. This suggests that companies in rural there are also affected by global value chains.

Figure II-1-1-54. Shares of companies engaged in direct and indirect trade



Source: Ishikawa, Saito and Taoka (2017) "Indirect Trade in Regional Economies" (RIETI Policy Discussion Paper Series 17-P-009).

Similarly, Ito and Saito (2018), which does an analysis using data on business transactions from Tokyo Shoko Research, demonstrates that both exports and imports have a significant positive impact on sales and the number of employees in both direct and indirect trade, indicating the importance of trade³⁰.

From this perspective, trade is also important for internationalizing small and medium-sized enterprises (SMEs) in rural areas. It is important for regional companies to think in terms of global growth and achieve more growth by connecting to global value chains through direct exporters, in³¹ addition to fulfilling the GLocal Growth Strategy, through which they can provides products and services directly to the global market.

²⁹ Major metropolitan areas are Saitama, Chiba, Tokyo, Kanagawa, Aichi, Kyoto, Osaka, and Hyogo prefectures. Other prefectures are classified as rural areas.

³⁰ Ito and Saito (2018), *Indirect Trade and Direct Trade: Evidence from Japanese firm transaction data*, RIETI Discussion Paper Series 18-E-065.

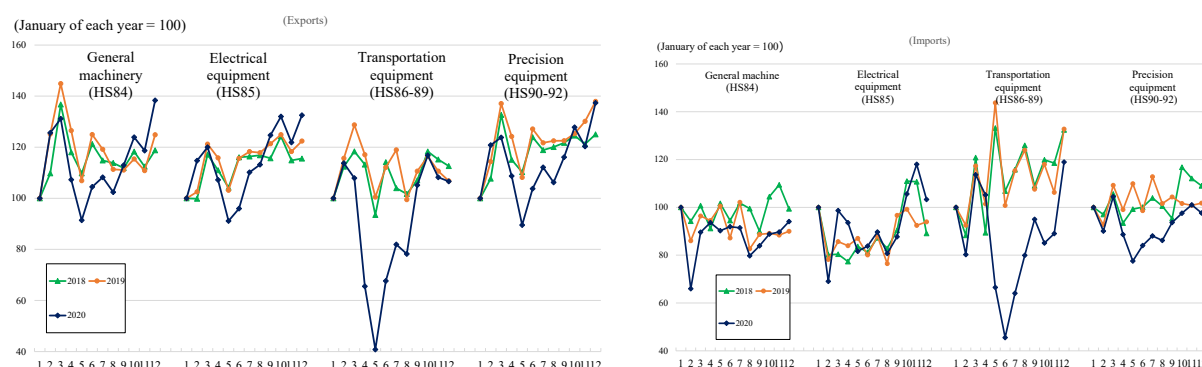
³¹ Ministry of Economy, Trade and Industry (2019), "GLocal Growth Strategy"

(2) Vulnerability and resilience of the global value chain

We will examine the impact of the COVID-19 shock on Japan's international production network using Ando, Kimura and Obashi (2021) as a base.³² The paper says that the COVID-19 shock caused a temporary decline in Japanese trade, but international production networks centered around machinery industries has overcome it and remains steady.

First, looking at the monthly trends in Japanese machinery exports in 2020, they fell significantly compared to previous years from March onward due to direct and indirect effects of the spread of COVID-19 in China throughout supply chains.³³ However, they bottomed out in May and recovered almost to the usual level around October (Figure II-1-1-55). The same trend can be seen in imports, particularly in those of transport machinery.

Figure II-1-1-55. Trends in Japan's machinery trade in 2020



Source: *Global Trade Atlas*.

Source: *Global Trade Atlas*.

In the figure, the decline from January to May was reduced to the smallest unit of Japan's bilateral trade and analyzed after being classified as either "Continuing," for countries and products for which transactions continued, "Exit," for those for which transactions stopped, or "Entry," for which transactions were newly started.³⁴ The results show that for both imports and exports, fewer trading relationships for parts exited compared to those for final products, and there were more stable relationships between parts and production. In other words, this indicates that the supply chain for parts is resilient (Figure II-1-1-56). At the very least, the temporary decline in demand did not disrupt the supply chain. Using a similar method, the authors point out in the paper that Japan's supply chains for parts were also resilient during the global financial crisis and the Great East Japan Earthquake³⁵.

³² Ando, Kimura and Obashi (2021), *International Production Networks Are Overcoming COVID-19 Shocks: Evidence from Japan's Machinery Trade*.

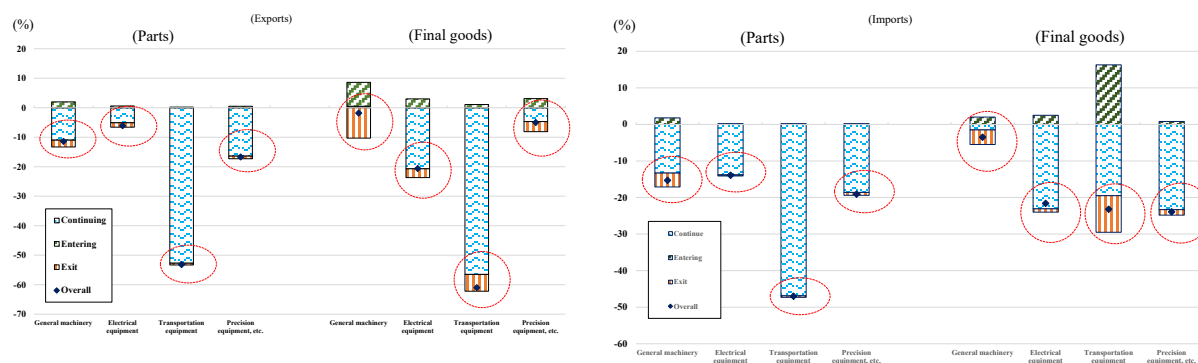
³³ Intermediate and final goods are indicated separately in the paper, but the totals are indicated here.

³⁴ Japan's exports and imports are classified by HS 9-digit commodity code and trading partner. They are also classified as "Continuing" if trade to a country for certain goods is conducted in both periods, t and $t-1$, "Entry" if only in period t , and "Exit" if only in period $t-1$.

³⁵ Ando and Kimura (2012), *How did the Japanese Exports Respond to Two Crises in the International Production Network? : The Global Financial Crisis and the Great East Japan Earthquake*.

Companies had spent money to adjust their supply chains, suggesting that such deep supply chains would not disappear easily.

Figure II-1-1-56. Breakdown of the initial decline in Japan's trade (year-on-year for January to May)



Source: Ando, Kimura, Obashi (2021), *International Production Networks Are Overcoming COVID-19 Shocks: Evidence from Japan's Machinery Trade*.

Source: Ando, Kimura, Obashi (2021), *International Production Networks Are Overcoming COVID-19 Shocks: Evidence from Japan's Machinery Trade*.

The paper also classifies fluctuations in Japan's trade caused by COVID-19 into price and quantity changes, and points out that the initial negative supply shock that decreased demand, as well as the following positive demand shock which increased demand and the negative demand shock which decreased demand happened at different times in different countries (Table II-1-1-57).

Table II-1-1-57. Details of the effects of the shocks to Japan's trade during the COVID-19 pandemic

Type of shock	Details
Negative supply shock	In the early days of COVID-19, production stagnated in China, including in Wuhan, where many manufacturing industries are concentrated. In Japan, imports of machinery from China declined rapidly. In addition, the decline in supplies of intermediary goods from China caused production to decline in ASEAN, North American, and EU countries through the supply chain. Imports to Japan from those countries and regions also declined.
Positive demand shock	Imports increased for personal protective equipment (e.g., masks), as well as machinery, such as telework-related goods (e.g., computers, memory devices, monitors, headphones), sprayers, goods for preventing contamination (e.g., thermometers), and goods for staying at home (e.g., refrigerators, household dishwashers).
Negative demand shock	Japan's falling quantity and prices of machinery and equipment imports suggest that demand is falling through the loss of jobs and decreasing incomes.

Note: The details are simplified. Refer to the paper for more information.

Source: Ando, Kimura, Obashi (2021), *International Production Networks Are Overcoming COVID-19 Shocks: Evidence from Japan's Machinery Trade*.

It must be noted that when there is supply chain resilience such as described here, it is important for companies to make efforts to maintain the supply chain. As we previously saw in JETRO's survey on Japanese companies, companies sometimes try to make adjustments (e.g., their suppliers or location of their production bases in the supply chain) depending on their situation.

Here, we will consider the importance of supply chains in the context of wide mutual ties between companies. Todo, Nakajima and Matous (2013) explores how effects by the supply chain on the economic resilience of companies should be thought of based on surveys on companies in areas affected by the Great East Japan Earthquake and on other research.³⁶ The Great East Japan Earthquake in March 2011 impacted not only the affected areas but also all of Japan and other countries through supply chains. The paper points out that supply chains not only had a negative effect, but it also drove the recovery from the disaster, and there was actually a greater positive effect overall.

The paper links transaction data for individual companies by TOKYO SHOKO RESEARCH to the results of a questionnaire survey, and analyzes what kinds of effects “the number of suppliers and purchasers inside and outside affected areas” has on “the number of days operations are suspended for”, “whether trading partners give support”, and other items. Table II-1-1-58 shows the results of the analysis. For example, the number of suppliers and purchasers outside affected areas have a significant negative effect on the number of days operations are suspended for. In other words, the more trading partners there are outside affected areas, the more quickly companies can resume operations. In addition, it is shown that if there are many purchasers outside affected areas, there is a higher possibility of receiving support toward recovery.

Table II-1-1-58. Impact on recovery if the number of business partners doubles

	Days with suspended operations		Sales growth rate		Days with suspended supply of parts		Support from companies		Changes in suppliers	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Suppliers in affected areas	None	None	4.2% pt	3.1% pt	None	38.0 %	None	None	2.9%	2.2%
Suppliers outside affected areas	-36.0%	-16.2%	None	None	None	21.7 %	None	None	None	None
Suppliers of suppliers	7.1%	None	None	None	11.3%	13.7 %			-1.1%	None
Purchasers in affected areas	None	None	3.0% pt	3.8% pt	34.0%	35.6 %	None	None	1.4%	1.1%
Purchasers outside affected areas	-28.0%	-14.5%	None	4.0% pt	None	26.8 %	None	4.4%	-1.8%	-1.3%
Purchasers of	5.8%	None	None	None	None	10.7			None	None

³⁶ Todo, Y., K. Nakajima and P. Matous (2013), "Supply Chain Networks Promote the Resilience of Firms to Natural Disasters: Lessons from the Great East Japan Earthquake," RIETI Policy Discussion Paper Series 13-P-006. In this case, supply chains were business relationships between companies in Japan and did not necessarily have to be linked to other countries.

purchasers	%
Notes: 1. (1) shows a summary of the results of a regression analysis with three suppliers as simultaneous independent variables and one with three purchasers as simultaneous independent variables. (2) shows a summary of the results of a regression analysis with six trading partners each with an independent variable. 2. The values are the changes in the dependent variable when each independent variable (number of business partners) is doubled. Values that are not significant at a level of 10% or higher are indicated with "None."	
Source: Todo, Nakajima and Matous (2013).	

As shown here, supply chains have the negative aspect of spreading the effects of disasters, they also have the positive aspects, such as allowing operations to resume more quickly the more trading partners there are outside affected areas, the faster the resumption of operations with more business partners outside the disaster area, the more companies affected by the disaster receive support from business partners, and the more effective the corporate network is in finding alternative companies. The analysis divides the affected area from the outside of the affected area, but of course, it is not clear where the disaster will occur beforehand. Building networks and linkages among a wide range of companies on a regular basis and increasing the diversity of the supply chain will increase the resilience of companies and supply chains.

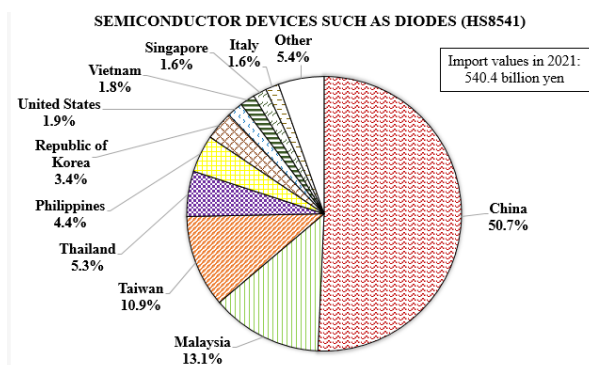
(3) Vulnerability of semiconductors and automotive parts

In 2021, semiconductors and automotive parts were particularly problematic in the supply chain where Japan is backward involved. What is common to both parts is that they were manufactured and exported in Japan over the long term, but in recent years, imports have increased and their overseas share has increased.

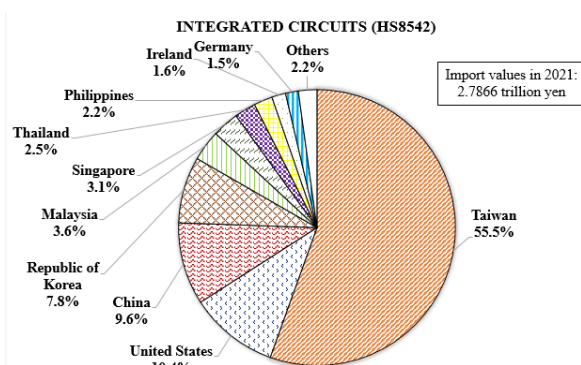
Consider the import situation in 2021. With regard to semiconductors, demand for semiconductors increased rapidly around the world against the backdrop of a rapid increase in demand for IT equipment, including teleworking, and a recovery in demand for automobiles, etc., following the government's economic support measures. On the other hand, the expansion of semiconductor production facilities takes a great deal of time and money, and semiconductor manufacturers are flooded with orders that exceed their supply capacity. In addition, supply constraints such as a fire accident at a major semiconductor company in Japan, a cold wave in North America, and restrictions on operation due to the spread of infection in Southeast Asia, exacerbated the tightening of subsidies.

Looking at the countries and regions from which Japan imports semiconductors, China accounts for 50% of single-function parts such as diodes (HS8541), followed by Asian countries such as Malaysia and Taiwan (Figure II-1-1-59). In the case of high-performance integrated circuits (HS8542) whose demand has been increasing in recent years, Taiwan accounts for more than 50% of imports, and Taiwan's market share continues to expand over the long term (Figure II-1-1-60).

Figure II-1-59.
Countries and regions from which Japan imports semiconductors (2021)



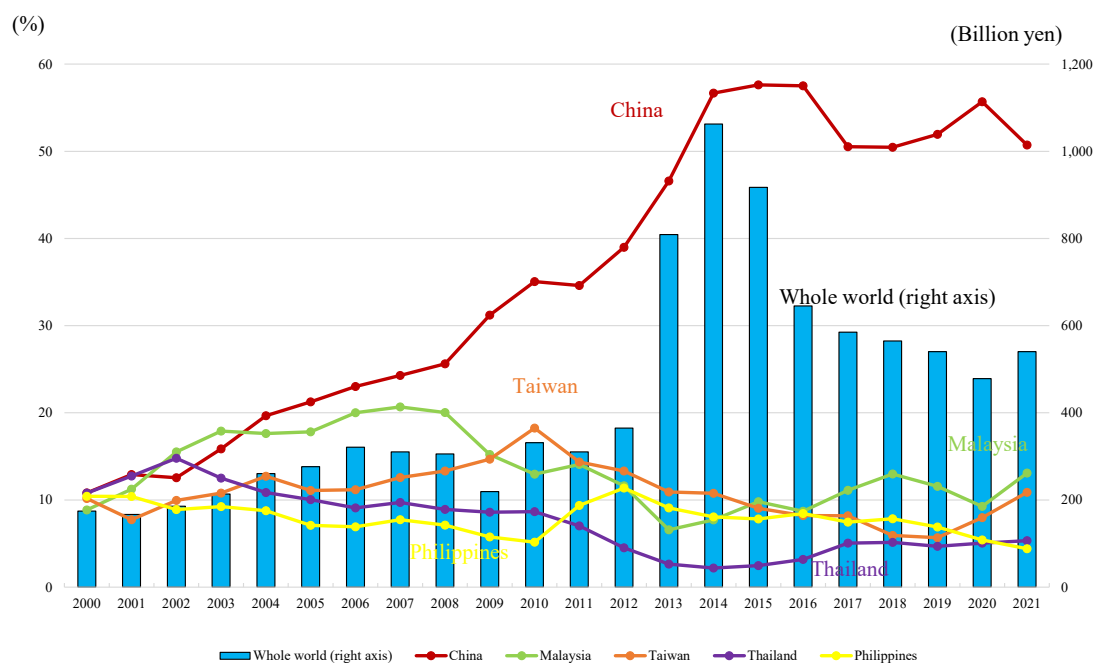
Source: *Global Trade Atlas*.



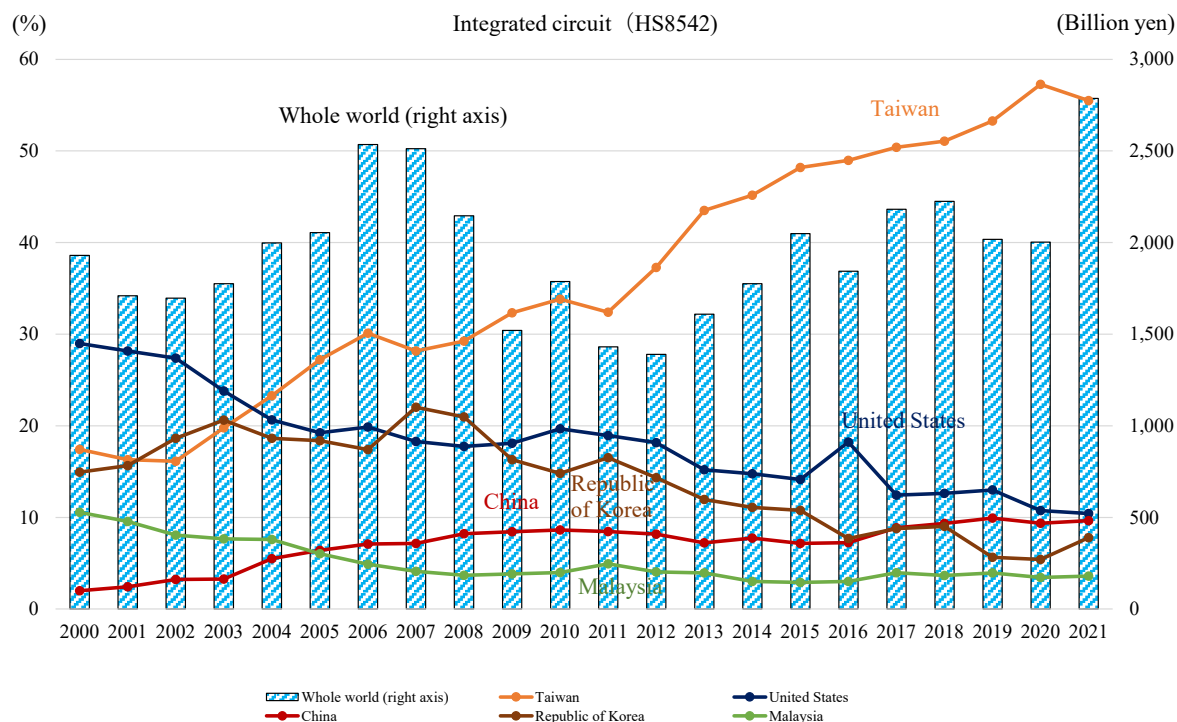
Source: *Global Trade Atlas*.

Figure II-1-1-60. Trends in the countries and regions from which Japan imports semiconductors

Semiconductor devices such as diodes (HS8541)



Source: *Global Trade Atlas*.

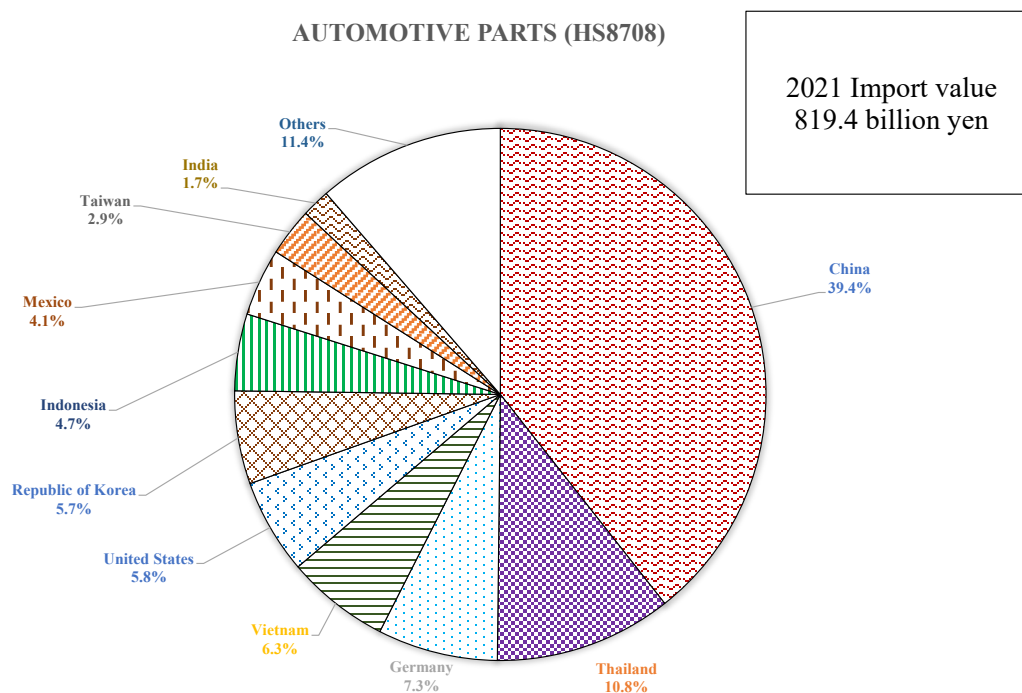


Source: *Global Trade Atlas*.

In addition, there are various types of parts used in automobiles, including semiconductors, which I mentioned earlier. Here, consider automobile parts with tariff number HS8708 as an example.³⁷ China accounts for about 40% of Japan's imports, and although its share peaked for a while, there are signs that it will rise again in the last two to three years (Figure II-1-1-61, Figure II-1-1-62).

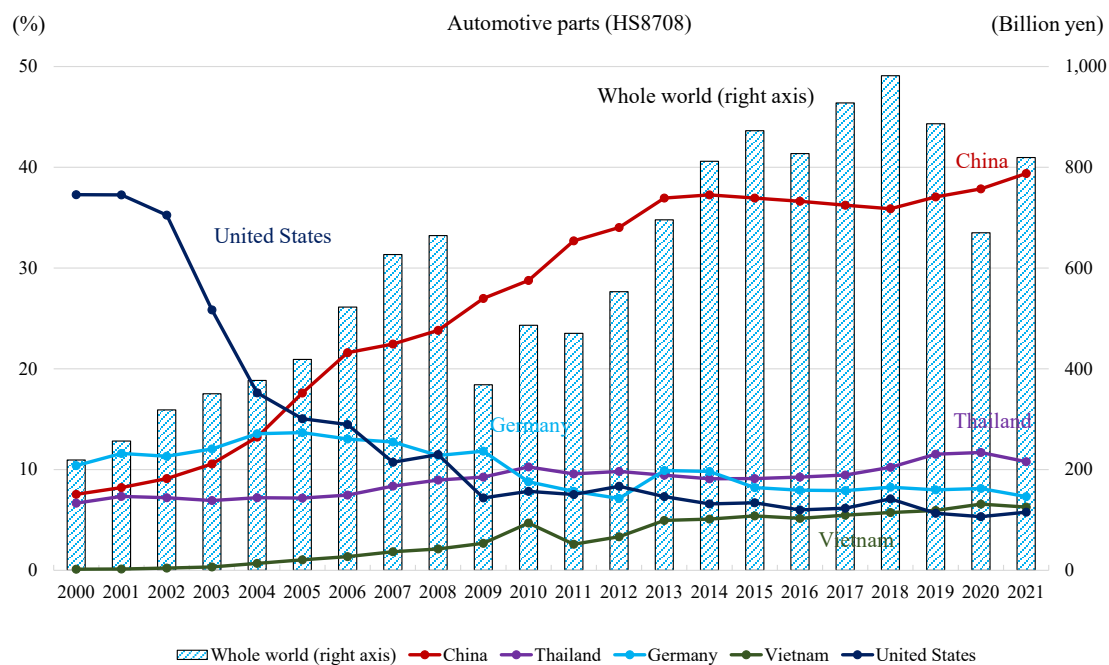
³⁷ This item includes the bumper (HS870810), the seat belt (HS870820), the brakes (HS870830), the gearbox (HS870840), drive and non-drive shafts (HS870850), wheels (870870), suspension equipment (870880), radiator (HS870891), silencer (HS870892), clutch (HS870893), handle (HS870894) and safety airbag (HS870895).

Figure II-1-1-61. Countries and regions from which Japan imports automotive parts (2021)



Source: *Global Trade Atlas*.

Figure II-1-1-62. Trends in countries and regions from which Japan imports automobile parts



Source: *Global Trade Atlas*.

Let's summarize what we have seen in this section. Through direct investment mainly in Asia, Japanese companies have developed overseas production bases, international division of labor, and a global value chain linking these bases. Japan has expanded its involvement in global value chains in the form of forward participation in the supply of intermediate goods as well as backward participation in the receipt of intermediate goods from overseas. In recent years, however, issues related to the global value chain have become apparent, both in front of and behind. For example, supply constraints due to the US-China conflict, infectious diseases such as COVID-19, and natural disasters. On the other hand, firms have reexamined their production bases and supply sources in anticipation of the US-China conflict, and have diversified and localized supply sources because some countries have a large share of supply sources of intermediate goods. In order to make such efforts successful, it is also important to visualize the network using digital technology. It is important for the government to prepare the business environment so that it can increase the options for network formation and restructuring by such companies. To this end, Japan is taking measures such as clarifying and strengthening international rules through economic partnership agreements and providing subsidies for supply chain diversification. The second and subsequent sections of this chapter will analyze in more concrete terms the challenges and efforts to strengthen supply chain resilience, especially the relationship with economic security.