Section 2 Countermeasures required for Japanese companies in the current trend of de-risking and further challenges

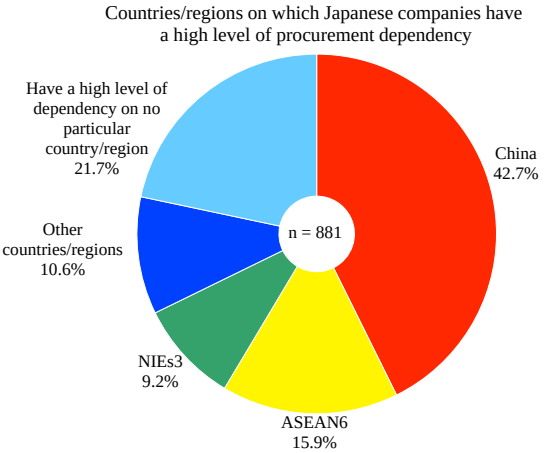
The previous section looked at the status of major countries' import dependency on particular countries. This section identifies the status of Japanese companies' procurement dependency on particular countries, not only in their domestic business activities but also in their global business activities, and looks at the activity to reduce dependency and the challenges in the way of doing so based on the results of the questionnaire survey (REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA),[209] conducted by Tokyo Shoko Research, Ltd.

1. Situation of and challenges for Japanese companies pursuing overseas expansion

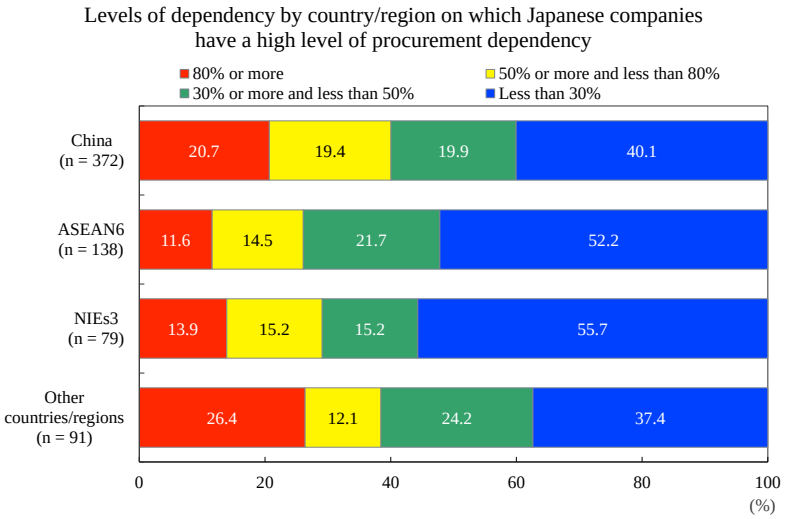
(1) Status of procurement dependency on particular countries/regions

First, from among the countries/regions on which Japanese companies (manufacturing and wholesale/retail trade companies that own overseas subsidiaries) have a high level of procurement dependency, China was cited as the major procurement source by the largest percentage of companies, slightly over 40%, followed far behind by ASEAN6 (Thailand, Indonesia, the Philippines, Malaysia, Viet Nam, and Singapore) and NIEs3 (Republic of Korea [ROK], Taiwan and Hong Kong). Meanwhile, slightly over 20% chose the reply "Have a high level of dependency on no particular country/region." As for the specific levels of dependency on the major procurement source countries/region, among the Japanese companies highly dependent on China, the percentage of those with a procurement dependency ratio of above 30% was around 60%, higher than the percentage among the companies that were highly dependent on ASEAN6 or NIEs 3 (Figure II-2-2-1).

Figure II-2-2-1. Countries/regions on which Japanese companies have a high level of procurement dependency and the levels of dependency



[209] The survey period: From January to February 2024; survey subjects: Companies (in the manufacturing and wholesale/retail trade industries) located in Japan and owning overseas subsidiaries that have been selected from the database of Tokyo Shoko Research; survey method: distributing and collecting a questionnaire by postal mail; the number of companies to which the questionnaire was mailed: 7,280; the number of companies that gave valid replies: 1,104 companies; recovery rate: 15.2%.



Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

As to the question of which industry sector of the major procurement source country/region was the largest procurement source, the metal product manufacturing industry was cited by the largest percentage of companies with respect to procurement from all countries/regions except for "other countries/regions." Regarding procurement from NIEs3, which includes Taiwan and the ROK, the electronic parts/devices/circuits industry, along with the metal product industry, was cited by the largest percentage (17.7%). As for noteworthy points concerning the industries cited by the second largest percentage or fewer of companies, the percentage that cited the textile industry (12.6%) or the electronic parts/devices/circuits industry (11.5%) was higher than 10% with respect to procurement from China, as was the percentage that cited the transportation equipment industry (11.6%) regarding procurement from ASEAN6 and the percentage that cited the steel industry (12.7%) and the wholesale/retail trade industry (10.1%) regarding procurement from NIEs3 (Table II-2-2-2).

Table II-2-2-2. Top 5 industries as the largest procurement source by country/region on which Japanese companies have a high level of procurement dependency

China (n = 364)		ASEAN6 (n = 138)		NIEs3 (n = 79)		Other countries/regions (n = 91)	
Top 5 industries	Share (%)	Top 5 industries	Share (%)	Top 5 industries	Share (%)	Top 5 industries	Share (%)
Metal product manufacturing	15.4	Metal product manufacturing	15.2	Metal product manufacturing	17.7	Chemicals	17.6
Textile	12.6	Transportation equipment manufacturing	11.6	Electronic parts/devices/ circuits manufacturing	17.7	Metal product manufacturing	13.2
Electronic parts/devices/ circuits manufacturing	11.5	Textile	8.7	Steel	12.7	Wholesale/retail trade	12.1
Chemicals	8.8	Wholesale/retail trade	7.2	Wholesale/retail trade	10.1	Mining	9.9
Electric equipment manufacturing	8.2	Chemicals	6.5	Chemicals	8.9	Transportation equipment manufacturing	7.7

Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan. As for the top 10 industries as the largest procurement source, the data on "other countries/regions" and "N/A" were excluded.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

When we look at which industry was the largest procurement source for Japanese companies classified by industry and workforce size regardless of the country/region on which they have a high level of procurement dependency, we find that in the manufacturing industry, the percentage of companies that cited the metal product industry was high relatively regardless of workforce size. Among companies with a larger workforce size, the percentage that cited the electronic parts/devices/circuits industry, the chemicals industry, or the transportation equipment industry tended to be higher while the percentage that cited the textile industry tended to be lower. In the wholesale/retail trade industry, the largest procurement source industry differed more pronouncedly across workforce sizes. Among companies with a larger workforce size, the percentage that cited the textile industry, the electric equipment industry, or the chemicals industry tended to be higher, while the percentage that cited procurement from the wholesale/retail trade industry—that is, sourcing within the same industry—tended to be lower (Table II-2-2-3).

Table II-2-2-3. Top 10 industries as the largest procurement source for Japanese companies by industry and workforce size

Japanese companies' industries	Manufacturing							
Workforce size	Less than 50 (n = 161)		50 or more and less than 100 (n = 102)		100 or more and less than 300 (n = 153)		300 or more (n = 153)	
Top 10 industries as the largest procurement source and the shares (%)	Metal product manufacturing	16.8	Metal product manufacturing	21.6	Metal product manufacturing	20.9	Electronic parts/devices/circuits manufacturing	14.4
	Textile	9.9	Chemicals	9.8	Chemicals	9.8	Chemicals	13.1
	Electronic parts/devices/circuits manufacturing	8.7	Electronic parts/devices/circuits manufacturing	8.8	Steel	9.8	Metal product manufacturing	13.1
	Chemicals	7.5	Manufacturing of general-purpose, production, and business-oriented machinery	7.8	Transportation equipment manufacturing	8.5	Transportation equipment manufacturing	9.2
	Steel	7.5	Non-ferrous metal product manufacturing	5.9	Manufacturing of general-purpose, production, and business-oriented machinery	5.9	Mining	8.5
	Electric equipment manufacturing	6.2	Transportation equipment manufacturing	5.9	Electronic parts/devices/circuits manufacturing	5.2	Non-ferrous metal product manufacturing	5.9
	Manufacturing of general-purpose, production, and business-oriented machinery	5.6	Steel	4.9	Mining	4.6	Steel	5.2
	Non-ferrous metal product manufacturing	5.0	Electric equipment manufacturing	4.9	Non-ferrous metal product manufacturing	4.6	Electric equipment manufacturing	3.3
	Wholesale/retail trade	3.7	Mining	3.9	Electric equipment manufacturing	4.6	Wholesale/retail trade	3.3
	Transportation equipment manufacturing	3.1	Textile	3.9	Manufacturing of petroleum and coal products	3.9	Manufacturing of ceramics, stone and clay products	2.6

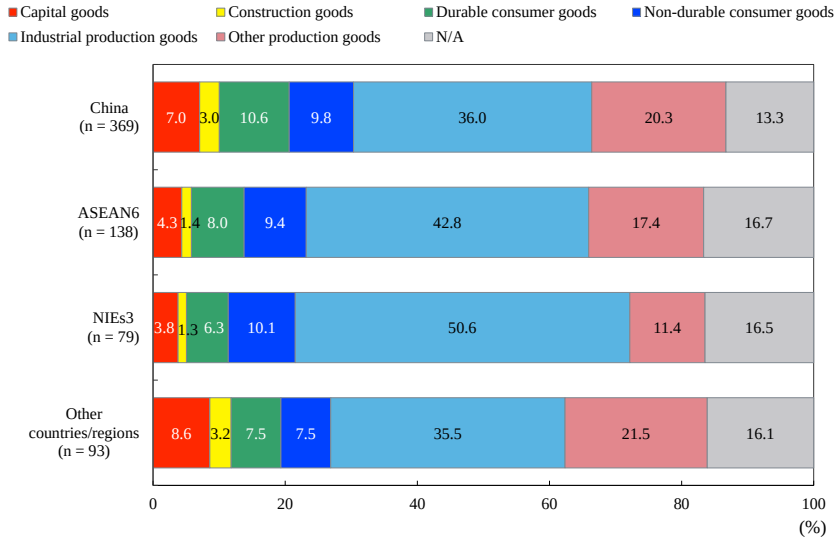
Japanese companies' industries	Wholesale/retail trade							
Workforce size	Less than 50 (n = 242)		50 or more and less than 100 (n = 65)		100 or more and less than 300 (n = 55)		300 or more (n = 31)	
Top 10 industries as the largest procurement source and the shares (%)	Wholesale/retail trade	18.6	Wholesale/retail trade	13.8	Textile	12.7	Textile	22.6
	Textile	12.8	Electronic parts/devices/circuits manufacturing	10.8	Electronic parts/devices/circuits manufacturing	12.7	Electric equipment manufacturing	19.4
	Electric equipment manufacturing	9.5	Electric equipment manufacturing	9.2	Chemicals	7.3	Chemicals	12.9
	Electronic parts/devices/circuits manufacturing	8.3	Textile	7.7	Steel	7.3	Steel	9.7
	Metal product manufacturing	7.9	Chemicals	7.7	Metal product manufacturing	7.3	Non-ferrous metal product manufacturing	6.5
	Chemicals	6.2	Manufacturing of petroleum and coal products	4.6	Manufacturing of general-purpose, production, and business-oriented machinery	7.3	Transportation equipment manufacturing	6.5
	Non-ferrous metal product manufacturing	3.7	Metal product manufacturing	3.1	Non-ferrous metal product manufacturing	5.5	Wholesale/retail trade	6.5
	Manufacturing of lumber and wood products	2.9	Manufacturing of information and communication electronics equipment	3.1	Wholesale/retail trade	5.5	Mining	3.2
	Manufacturing of pulp, paper and paper products	2.1	Transportation equipment manufacturing	3.1	Electric equipment manufacturing	3.6	Electronic parts/devices/circuits manufacturing	3.2
	Mining	1.7	Manufacturing of lumber and wood products	1.5	Mining	1.8	-	-

Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan. As for the workforce size, the data on "unknown" were excluded. As for the top 10 industries as the largest procurement source, the data on "other countries/regions" and "N/A" were excluded.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

Next, let us look at which type of goods was the major item of procurement by Japanese companies from their major procurement source countries/regions. First, with respect to procurement from all major procurement source countries/regions, production goods (industrial production goods and other production goods) accounted for the largest share in overall procurements by Japanese companies. Regarding procurement from China, capital goods, construction goods, and consumer goods (durable and non-durable goods) accounted for large shares compared with procurement from other countries/regions (Figure II-2-2-4).

Figure II-2-2-4. Types of Japanese companies' procured goods by country/region on which the companies have a high level of procurement dependency

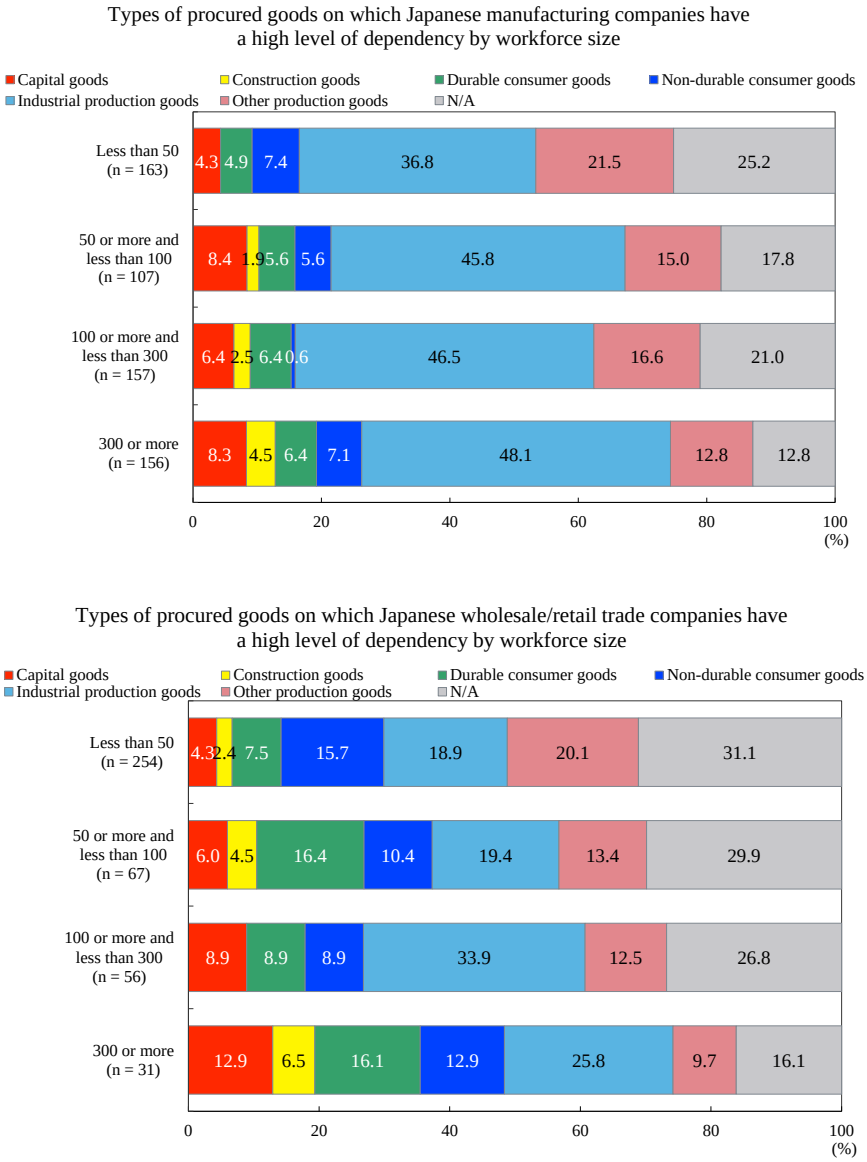


Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

When we look at the type of goods procured by Japanese companies classified by industry sector and by workforce size regardless of which country/region was their major procurement source, by industry, we find that the largest percentage cited industrial goods in the manufacturing industry and consumer goods (durable and non-durable goods) in the wholesale/retail trade industry. By workforce size, the larger the workforce size was, the lower the percentage that chose other production goods tended to be in both the manufacturing industry and the wholesale/retail trade industry. In the wholesale/retail trade industry, the percentage that cited capital goods tended to be higher among companies with a larger workforce size (Figure II-2-2-5).

Figure II-2-2-5. Types of Japanese companies' procured goods by industry and workforce size



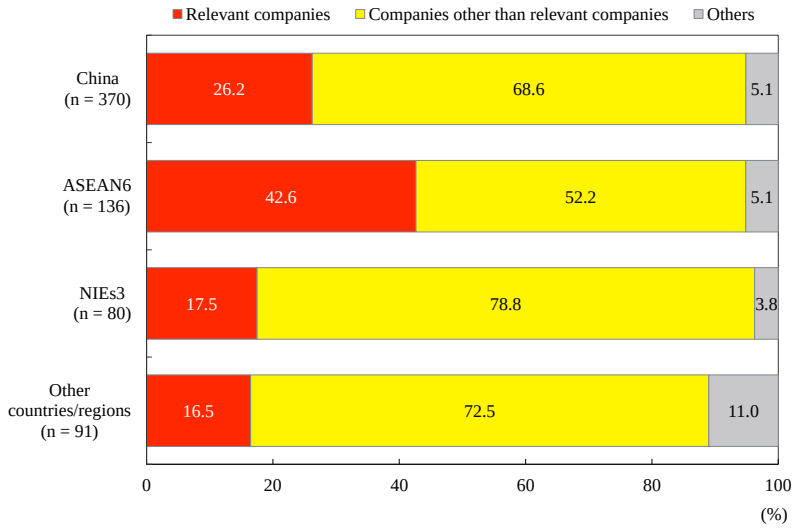
Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan. As for the workforce size, the data on "unknown" were excluded.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

When we look at the capital or control relationship that Japanese companies have with procurement source companies in each of the major procurement source countries/regions, we find that more than half were procuring goods from companies other than those with which they had a capital relation as regards procurement from all countries/regions. However, as regards procurement from ASEAN6, the percentage of companies that were procuring goods from companies with which they had a capital

relation was also relatively high, slightly over 40%, indicating that this region has a large cluster of companies that have a capital or control relationship with Japanese companies (Figure II-2-2-6).

Figure II-2-2-6. Types of supplier companies by country/region on which Japanese companies have a high level of procurement dependency



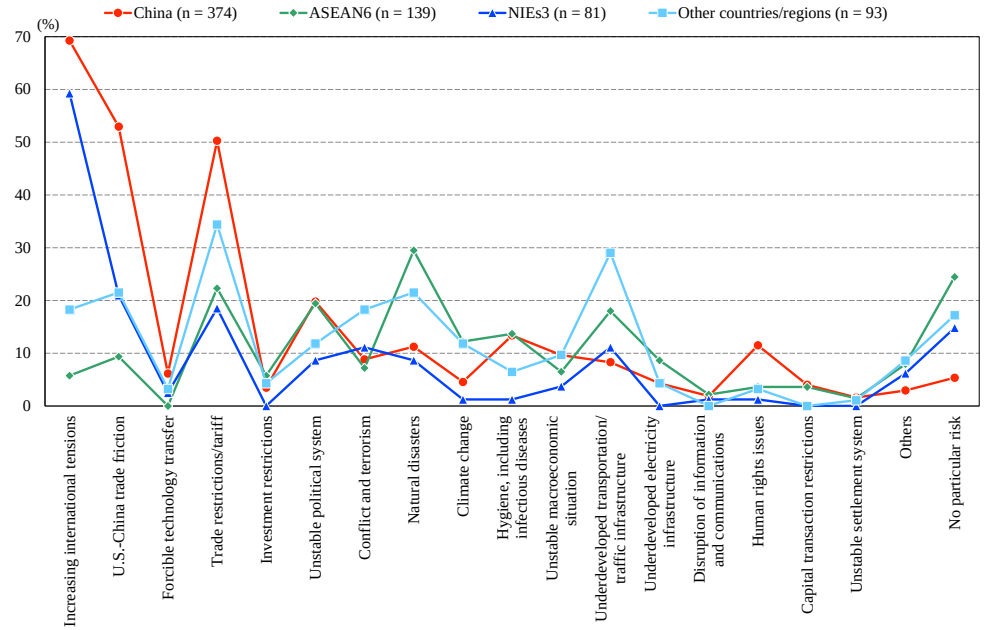
Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan. "Relevant companies" means companies 20% to 50% of whose voting rights are owned by a certain company or companies merely 15% to 20% of whose voting rights are owned by a certain company but to which the company can have a significant impact.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

Next, let us look at specifically what kind of risk Japanese companies recognized with respect to their major procurement source countries/regions. Regarding China, the risks cited by many companies include "Increasing international tensions" (69.3%), "U.S.-China trade friction" (52.9%), and "Trade restrictions/tariffs" (50.3%). The percentage that cited either of these risks for China was conspicuously high compared with the percentage that cited either of the same risks for other countries/regions. Although "Unstable political system" (19.8%), "Human rights issues" (11.5%), and "Forcible technology transfer" (6.1%) were cited for China by relatively small percentages compared with other risks, those rates were higher than the percentages that cited those risks for other countries/regions. Regarding ASEAN6, "Natural disasters" (29.5%), "Trade restrictions/tariffs" (22.3%), "Unstable political system" (19.4%), and "Underdeveloped transportation/traffic infrastructure" (18.0%) were cited by many companies, but apart from "Natural disasters," there was no risk cited by a conspicuously high percentage compared with the results for other countries/regions. At the same time, the percentage that chose the reply "No particular risk" (24.5%) was higher for ASEAN6 than for any other country/region, indicating that this region is considered to be of relatively low risk. Regarding NIEs3,

which includes Hong Kong and Taiwan, “Growing international tensions” (59.3%), “U.S.-China trade friction” (21.0%), and “Trade restrictions/tariffs” (18.5%) were cited by many companies. In particular, as in the case of China, the percentage that cited “Growing international tensions” was conspicuously high compared with the results for other countries/regions (Figure II-2-2-7).

Figure II-2-2-7. Details of Japanese companies’ risk recognition by country/region on which the companies have a high level of procurement dependency



Note: Multiple replies were allowed.

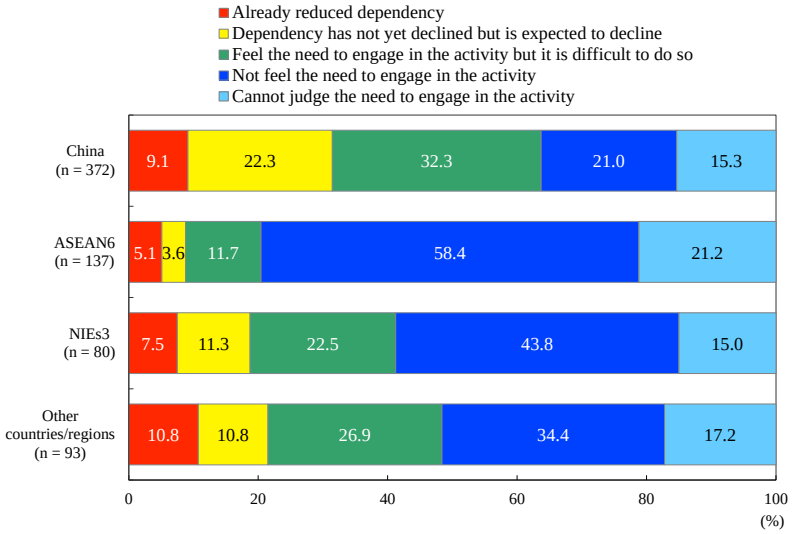
Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

(2) Status of engagement in the activity to reduce procurement dependency and challenges

Above, we looked at the status of Japanese companies’ procurement dependency on particular/countries/regions. Below, let us look at the status of engagement in the activity to disperse risks as a way to improve this situation. First, when we look at the status of engagement in the activity to reduce dependency by major procurement source country/region, we find that among companies highly dependent on China, those that replied that they were engaging in some kind of activity to reduce dependency (31.5%: the total sum of the percentage that chose the reply “Already reduced dependency” and the percentage that chose “Dependency has not yet declined but is expected to decline”) and those that chose “Feel the need to engage in the activity but it is difficult to do so” (32.3%) accounted for the two largest percentages. The percentage that chose “Not feel the need to engage in the activity” (21.0%) was the lowest, indicating that the need for such activity was felt strongly among companies dependent on China compared with companies dependent on other countries/regions. On the other hand, among companies dependent on ASEAN6, the percentage that chose “Not feel the need to engage in the activity” (58.4%) was the highest, indicating that this region is considered to be of relatively low risk. Among companies dependent on NIEs3, the level of risk recognized, as reflected by the level of engagement in

the activity to reduce dependency, is around the middle between the levels of risk recognized with respect to China and ASEAN6. (Figure II-2-2-8).

Figure II-2-2-8. Status of Japanese companies' engagement in the activity to reduce procurement dependency by country/region on which the companies have a high level of the dependency

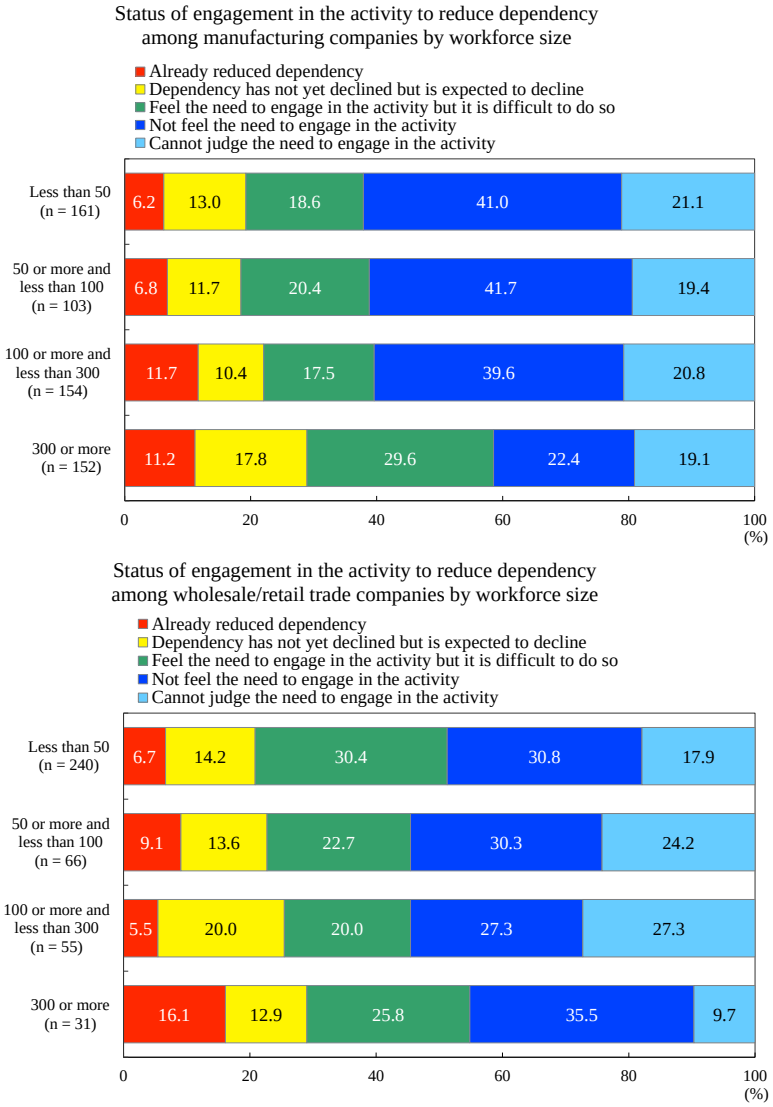


Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

When we look at the status of engagement in the activity to reduce dependency among Japanese companies by industry and by workforce size, we find that regardless of which countries/regions are major procurement sources, the percentage of those that strongly recognized the need to engage in the activity to reduce dependency (the total sum of the percentage that chose "Already reduced dependency," the percentage that chose "Dependency has not yet declined but is expected to decline," and the percentage that chose "Feel the need to engage in the activity but it is difficult to do so") was higher in the wholesale/retail trade industry than in the manufacturing industry. By workforce size, in both of those industries, the larger the workforce size was, the higher the percentage of companies that were engaging in some kind of activity to reduce dependency (the total sum of the percentage that chose "Already reduced dependency" and the percentage that chose "Dependency has not yet declined but is expected to decline") tended to be (Figure II-2-2-9).

Figure II-2-2-9. Status of engagement in the activity to reduce dependency among Japanese companies by industry and workforce size



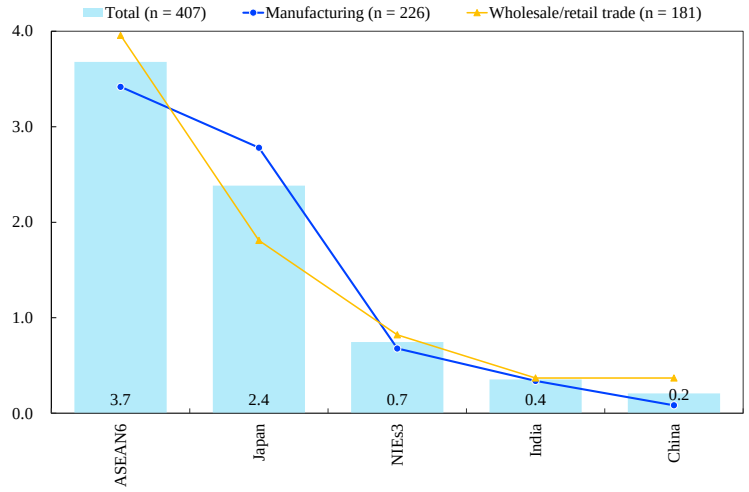
Note: This survey targeted industrial products procured by Japanese companies and their subsidiaries (including overseas subsidiaries), and respondent companies gave an answer about the products with a high level of procurement dependency on particular countries/regions outside Japan. As for the workforce size, the data on "unknown" were excluded.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

Next, we will look at countries/regions that are considered to be promising as alternative procurement sources. Figure II-2-2-10 shows the results of the weighted scoring of survey replies regarding the top three alternative procurement source countries/regions (the points awarded to the top three are as follows: No. 1: three points; No. 2; two points; No. 3: one point), with the scores indexed in such a way that the average score comes to zero and the standard deviation comes to 1. The graph shows the countries/regions whose score was above average. On an all-industry basis, ASEAN6 and Japan are considered to be the most promising alternative procurement sources, followed by NIEs3, India, and

China. By industry, while there is no difference in the rankings of the most promising alternative procurement sources between the manufacturing industry and the non-manufacturing industry (wholesale/retail trade industry), the manufacturing industry has a stronger tendency to select Japan as a promising alternative procurement source than the non-manufacturing industry.

Figure II-2-2-10. Countries/regions considered to be promising as alternative procurement sources

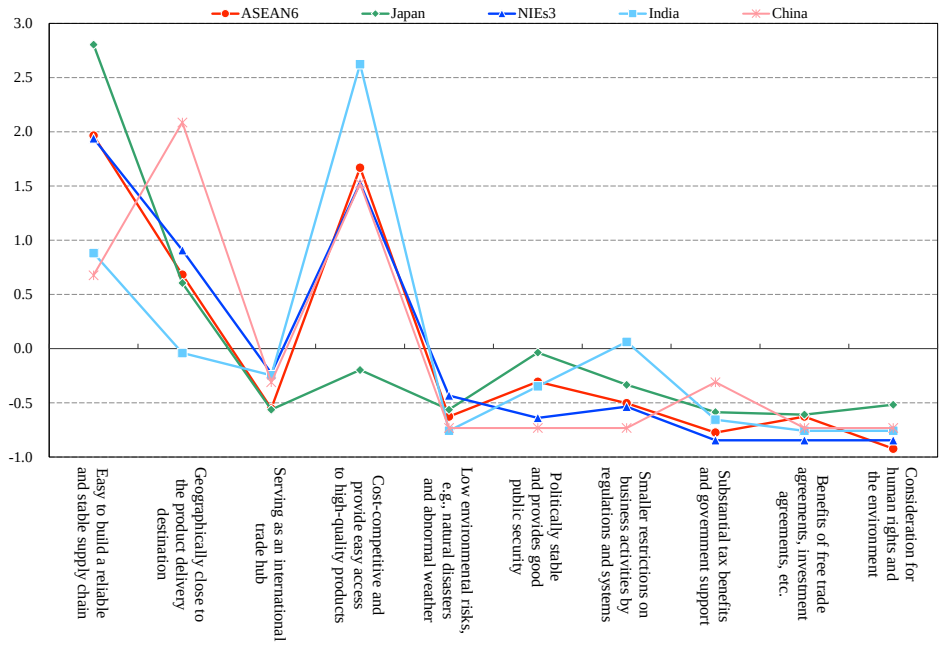


Note: As for the status of engagement in the activity to reduce dependency, companies chose "Already reduced dependency" or "Dependency has not yet declined but is expected to decline" were set as the population. The figure shows the results of the weighted scoring of the replies regarding the top three alternative procurement source countries/regions (the points awarded to the top three are as follows: No. 1: three points; No. 2; two points; No. 3: one point), with the scores indexed in such a way that the average score comes to zero and the standard deviation comes to 1. The graph shows the countries/regions whose score was above average.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

As to the reasons for selecting countries/regions as promising alternative procurement sources, similar reasons were cited for selecting ASEAN6 and NIEs3. Among the reasons cited by many companies for selecting those two regions are "Easy to build a reliable and stable supply chain," "Cost-competitive and provide easy access to high-quality products," and "Geographically close to the product delivery destination." Among the reasons cited by many for selecting Japan are "Easy to build a reliable and stable supply chain," "Geographically close to the product delivery destination," and "Politically stable and provides good public security," and this indicates that Japan is considered to help secure lower-risk procurement compared with ASEAN6. Among the reasons cited by many for selecting India are "Cost-competitive and provides easy access to high-quality products" and "Easy to build a reliable and stable supply chain," while "Geographically close to the product delivery destination," "Cost-competitive and provides easy access to high-quality products," and "Easy to build a reliable and stable supply chain," were cited by many for selecting China (Figure II-2-2-11).

Figure II-2-2-11. Reasons for selecting countries/regions as promising alternative procurement sources classified by country/region

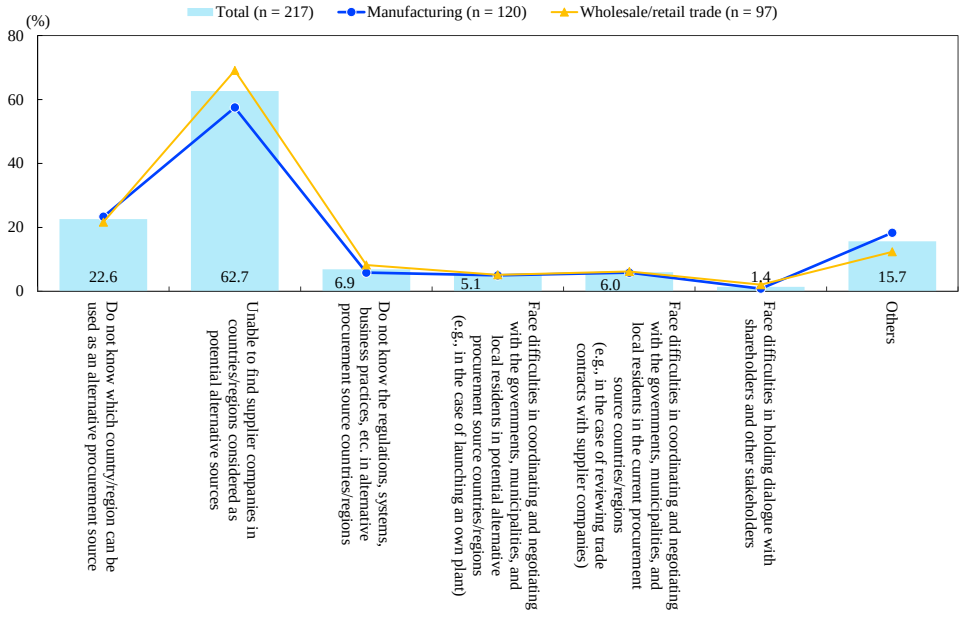


Note: As for the status of engagement in the activity to reduce dependency, companies chose "Already reduced dependency" or "Dependency has not yet declined but is expected to decline" were set as the population. Regarding the top three alternative procurement source countries/regions, the respondents chose multiple replies about the reasons for choosing the countries/regions. The figure shows the results of the weighted scoring of the replies regarding the countries/regions (the points awarded to the top three are as follows: reason for choosing No.1: three points; reason for choosing No.2; two points; reason for choosing No.3: one point), with the scores indexed in such a way that the average score comes to zero and the standard deviation comes to 1.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

Above, we looked at companies engaging in the activity to reduce procurement dependency. Below, regarding companies not engaging in such activity, we will examine the reasons for and the backgrounds to their lack of engagement in the activity. First, in the case of companies that chose the reply "Feel the need to engage in the activity but it is difficult to do so," "Unable to find supplier companies in countries/regions considered as potential alternative sources" (62.7%) was cited as the reason by overwhelmingly the largest percentage of companies, followed far behind by "Do not know which country/region can be used as an alternative procurement source" (22.6%). Other reasons—those associated with factors that may arise after the selection of an alternative procurement source country and an alternative supplier company—were not cited by many companies. This indicates that the major challenge is taking the first step toward reducing dependency—that is, finding a potential alternative supplier company and an alternative procurement source country/region. (Figure II-2-2-12).

Figure II-2-2-12. Reasons for facing difficulty in engaging in the activity to reduce procurement dependency

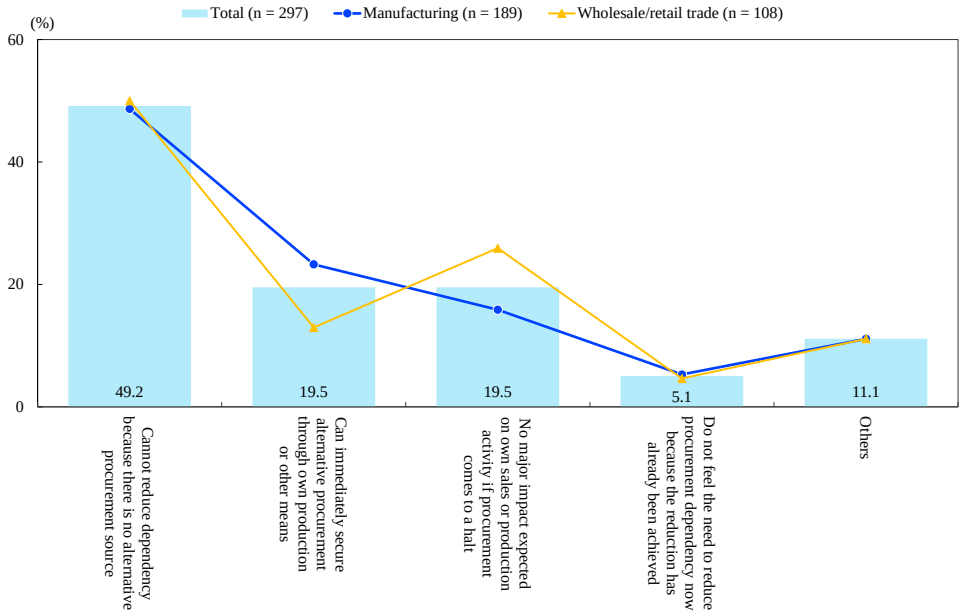


Note: As for the status of engagement in the activity to reduce dependency, companies chose “Feel the need to engage in the activity but it is difficult to do so” were set as the population. Multiple replies were allowed. The numeral values shown in the figure show the percentages of the given response in all responses (manufacturing and wholesale/retail trade).

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

Next, in the case of companies that chose the reply “Do not feel the need to engage in the activity now” when asked about the status of engagement in the activity to reduce dependency, “Cannot reduce dependency because there is no alternative procurement source” (49.2%) was cited as the reason for not feeling the need by overwhelmingly the largest percentage of companies, followed by “Can immediately secure alternative procurement through own production or other means” (19.5%) and “No major impact expected on own sales or production activity if procurement comes to a halt” (19.5%). The second of these two latter reasons may be understood to mean that in a sense, procurement-related risks have been factored into business management, whereas the first of the two reasons indicates that there is room for further reducing risks, for example by looking for an alternative procurement source. (Figure II-2-2-13).

Figure II-2-2-13. Reasons for feeling no need to engage in the activity to reduce procurement dependency



Note: As for the status of engagement in the activity to reduce dependency, companies chose "Not feel the need to engage in the activity" were set as the population. Multiple replies were allowed. The numeral values shown in the figure show the percentages of the given response in all responses (manufacturing and wholesale/retail trade).

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

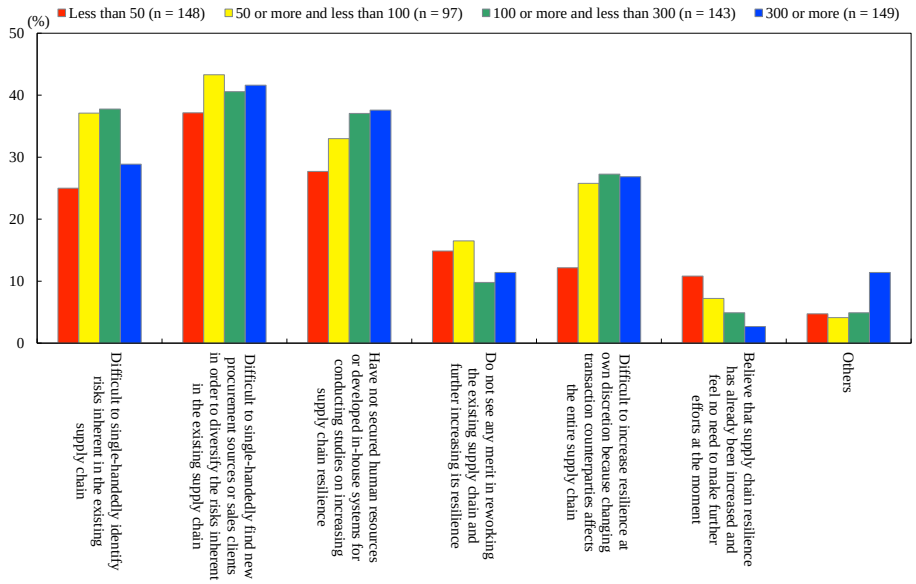
(3) Challenges in the way of increasing supply chain resilience, including in terms of procurement and sales

Finally, we will look at the challenges recognized by Japanese companies that should be overcome to increase supply chain resilience in terms of not only procurement but also sales. First, regardless of the industry sector and workforce size, the three most frequently cited challenges were: "Difficult to single-handedly find new procurement sources or sales clients in order to diversify the risks inherent in the existing supply chain," "Have not secured human resources or developed in-house systems for conducting studies on increasing supply chain resilience," and "Difficult to single-handedly identify risks inherent in the existing supply chain." Those three were followed by "Difficult to increase resilience at own discretion because changing transaction counterparties affects the entire supply chain." All of the three most frequently cited challenges indicate the difficulty faced by companies in increasing supply chain resilience through their own resources (human resources and knowledge) alone, pointing to the need for assistance from supporters possessing relevant knowledge and for efforts on an industry-wide basis.

Next, regardless of the industry sector, among companies with a larger workforce, the percentage of those that cited "Do not see any merit in reworking the existing supply chain and further increasing its resilience" and "Believe that supply chain resilience has already been increased and feel no need to make further efforts at the moment" was smaller. This indicates that risk awareness is stronger among companies with a larger workforce.

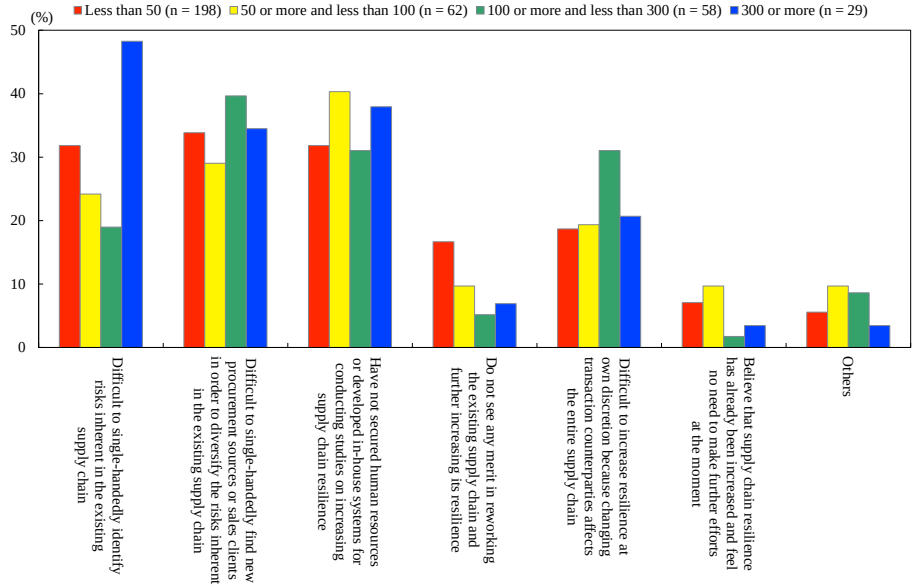
In both industries, the percentage of companies that cited "Have not secured human resources or developed in-house systems for conducting studies on increasing supply chain resilience" did not vary significantly across workforce sizes. This indicates that even large companies find it difficult to increase supply chain resilience with their existing resources and in-house systems (Figures II-2-2-14 and II-2-2-15).

Figure II-2-2-14. Challenges in increasing supply chain resilience in manufacturing, including procurement and sales



Note: Multiple answers were allowed. As for the workforce size, the data on "unknown" were excluded.
Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

Figure II-2-2-15. Challenges in increasing supply chain resilience in wholesale/retail trade, including procurement and sale



Note: Multiple answers were allowed. As for the workforce size, the data on "unknown" were excluded.
Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

(4) Decision tree-based additional analysis of the status of engagement in activity to reduce the level procurement dependency and the characteristics of the selection of alternative procurement sources

Finally, we use the decision tree, a sort of machine learning approach, to apply more layered classification to the results of the questionnaire survey and identify the characteristics of companies' procurement behavior that are difficult to observe from simple tabulation or cross tabulation. According to Kin (2007),[210] a decision tree represents a distinction/prediction model composed by splitting independent variables into branch variables based on certain criteria. The model is called a decision tree after the tree-like structure of a diagram that depicts the process of splitting variables into branches. It is presumed that under the decision tree approach, classification is made in a way that makes the characteristics of the analysis subject most pronounced within the ranges of control items, such as the independent variables and criteria used, and the complexity of the model.

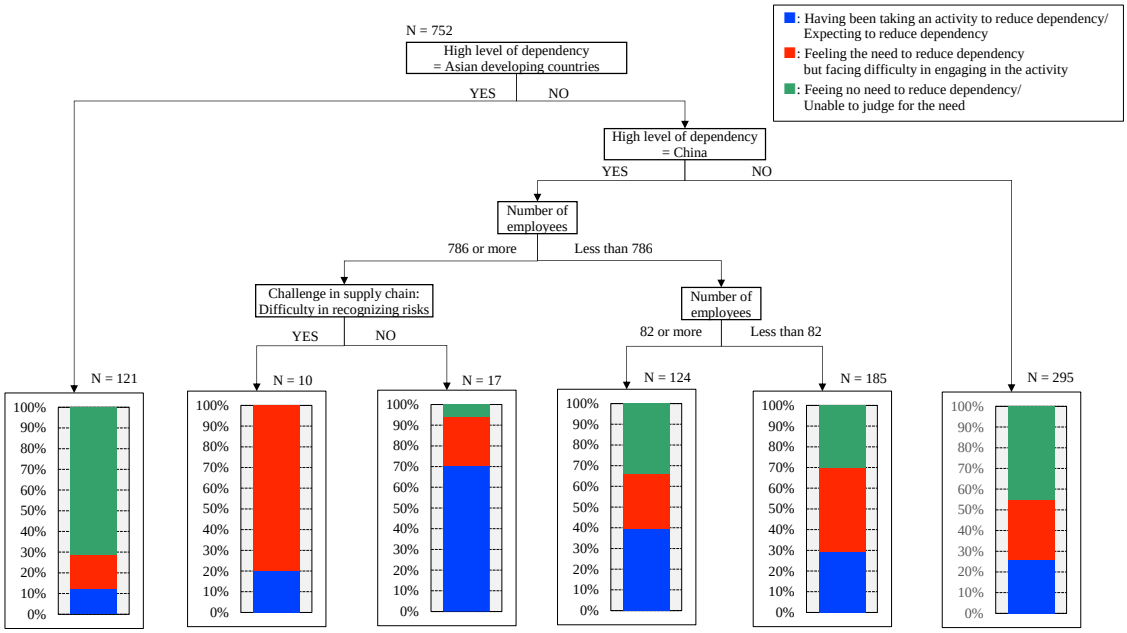
First, using the decision tree approach, we identified the characteristics of differences in companies' engagement in the activity to reduce the level of procurement dependency. Specifically, we classified the surveyed companies into the following three categories: (i) companies capable of engaging in the

[210] Kin, M. (2007), "AARU NIYORU DEETA SAIENSU (2nd edition)," Morikita Publishing.

activity to reduce procurement dependency (companies that replied that they had already reduced the level of dependency, or that although the level of dependency had not yet fallen, they expected to reduce the level); (ii) companies facing difficulty in engaging in the activity (companies that replied that although they felt the need for the activity, it is difficult to engage in it); and (iii) companies that did not recognize the need to engage in the activity (companies that replied that they did not feel the need to engage in the activity or that they were unable to judge for the moment whether or not the activity was necessary). The following criteria for determining the status of engagement were used for the classification: awareness about the challenges involved in increasing the resilience of supply chains, company size (number of employees), the industry sector, the regions on which the level of dependency is high, the industry sector to which the procurement source belongs, and the company type of the procurement source. Figure II-2-2-16 shows the classification results. According to the figure, first, among the companies that had a high level of dependency on Asian emerging countries (Thailand, Indonesia, Malaysia, the Philippines, Viet Nam, and India), the percentage of those that did not recognize the need to engage in the activity to reduce procurement dependency was around 70%. Among the companies that had a high level of dependency on countries and regions other than China and Asian emerging countries, the percentage of those that did not recognize the need to reduce procurement dependency was 50%. Secondly, among the companies with 786 or more employees that had a high level of procurement dependency on China and that also cited difficulty in recognizing risks as a challenge in the way of increasing the resilience of supply chains, the percentage of those that faced difficulty in engaging in the activity was around 80%. On the other hand, among the companies that did not cite difficulty in recognizing risks, the percentage of those that were capable of engaging in the activity was around 70%. Thirdly, among the companies that had a high level of procurement dependency on China and those that also had between 82 and 786 employees, the percentage of those that were capable of engaging in the activity to reduce the level of dependency was around 40% and the percentage of those that faced difficulty in doing so was around 25%. On the other hand, among the companies that had less than 82 employees, the percentage of those that were capable of engaging in the activity was around 30%, while the percentage of those that faced difficulty in doing so was around 40%.

The cross tabulation results cited earlier already showed that among the companies that had a high level of procurement dependency on China, the percentage of those that felt the need to reduce dependency was high, although only some of them actually did so. However, as a result of using the decision tree to identify the characteristics of companies' approach to reducing procurement dependency, we found that among the companies that had a high level of procurement dependency on China and that also felt difficulty in recognizing the risks inherent in supply chains on their own regardless of the number of employees, the percentage of those that faced difficulty in engaging in the activity to reduce dependency was high. We also found that among the companies that had a high level of procurement dependency on Asian emerging countries, the percentage of those that did not feel the need to reduce dependency was high.

Figure II-2-2-16. Response-by-response characteristics of differences in companies' engagement in the activity to reduce the level of procurement dependency



Note: METI defined, as a dependent variable, the differences in companies' engagement in the activity to reduce the level of procurement dependency (three categories) and the following as independent variables: awareness about the challenges involved in increasing the resilience of supply chains (multiple choices allowed), the number of employees, the industry sector (manufacturing and wholesale and retail trade), the country and region on which the level of dependency is high (China, Asian developed countries [Hong Kong, the ROK, Taiwan, and Singapore], Asian emerging countries [Thailand, Indonesia, Malaysia, the Philippines, Viet Nam, and India], and others), the industry sector to which the procurement source belongs (17 sectors), and the company type (relevant company or not). When conducting the classification, it set the complexity parameter (cp) to 0.01, the maximum depth to 4, the minimum number of individuals for branching to 20, and the minimum number of individuals falling under each category to 7, and used the Gini coefficient to calculate the branching point.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

Next, focusing attention on companies that replied that they had already reduced the level of their dependency or that they expected to do so, we examined the characteristics of those companies' selection of countries/regions as alternative or potential alternative procurement sources. Alternative and potential alternative procurement sources are classified into five categories: (i) Japan, (ii), China, (iii) NIEs, (iv) Asian emerging countries (Thailand, Indonesia, Malaysia, the Philippines, Viet Nam and India), and (v) others. The independent variables used for the classification are the countries/regions on which the level of dependency is high, the specific level of dependency on those countries/regions, the reason for selecting alternative and potential alternative procurement sources, the challenges in the way of increasing the resilience of supply chains, the number of employees, and the industry sector. Figure II-

2-2-17 shows the results of the classification made under the tree decision approach. The questionnaire asked respondents to choose and rank by priority three alternative and potential alternative procurement source countries/regions. However, our analysis gave no particular consideration to the ranking by priority and applied equal treatment to all countries/regions selected by respondents.

As a result, we found, first, that among the companies that had a high level of procurement dependency on China and that also chose a high level of cost competitiveness as the reason for selecting alternative procurement sources, the percentage of those that selected Asian emerging countries (Thailand, Indonesia, Malaysia, the Philippines, Viet Nam, and India) as alternative procurement sources was around 70%. Of the companies that had a high level of dependency on China, that also did not choose a high level of cost competitiveness as the reason for selecting alternative procurement sources, and whose dependency rate on China was 30% or higher, around 60% selected emerging Asian countries and 20% selected Japan as alternative procurement sources.

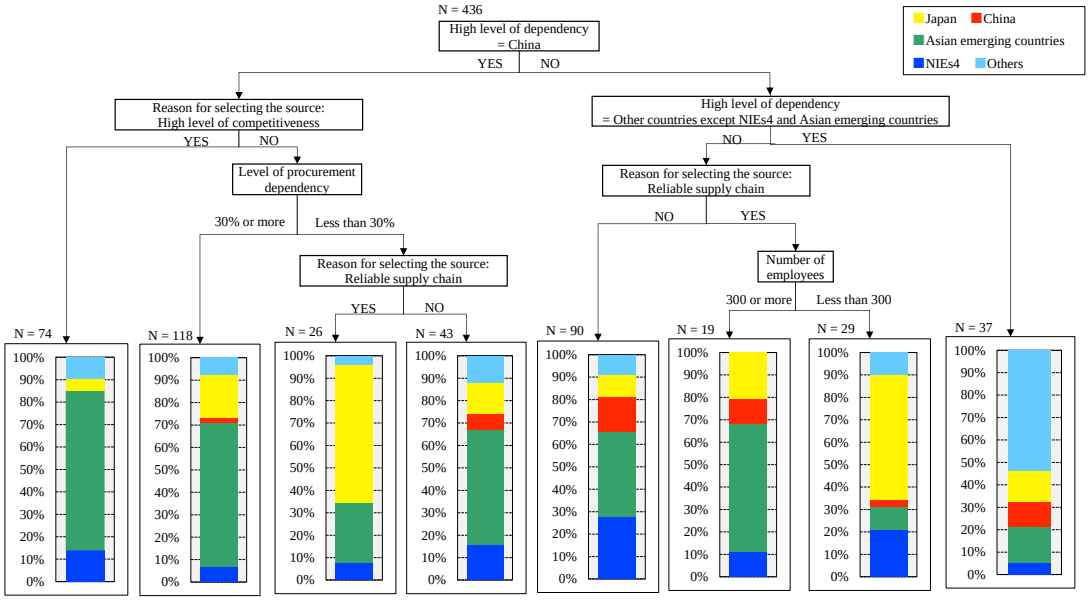
Secondly, among the companies that had a high level of dependency on China, that did not choose a high level of cost competitiveness as the reason for selecting alternative procurement sources, whose dependency rate on China was less than 30%, and that also chose the ease of building a reliable and stable supply chain as the reason for selecting alternative procurement sources, around 60% selected Japan and around 20% selected Asian emerging countries as alternative procurement sources. On the other hand, among the companies that did not choose the ease of building a reliable and stable supply chain, around 50% selected Asian emerging countries and around 10% each selected Japan, NIEs, or other regions as alternative procurement sources.

Thirdly, among the companies that had a high level of procurement dependency on other regions, around 50% selected other regions, around 20% selected Asian emerging countries, and around 10% each selected Japan or China as alternative procurement sources.

Fourthly, among the companies that had a high level of dependency on Asian developed and emerging countries (excluding China) and chose the ease of building a reliable and stable supply chain as the reason for selecting alternative procurement sources and that also had 300 or more employees, around 60% selected Asian emerging countries and around 20% selected Japan as alternative procurement sources. On the other hand, among the companies that had less than 300 employees, around 60% selected Japan and around 20% selected NIEs as alternative procurement sources.

Fifthly, among the companies that had a high level of dependency on NIEs and Asian emerging countries (excluding China) and that also did not choose the ease of building a reliable and stable supply chain as the reason for selecting alternative procurement sources, around 40% selected Asian emerging countries, around 25% selected NIEs, and around 15% chose China as alternative procurement sources.

Figure II-2-2-17. Response-by-response characteristics of alternative procurement sources



Note: METI defined, as dependent variables, alternative procurement sources and their potential countries and regions (Japan, China, Asian developed countries [Hong Kong, the ROK, Taiwan, and Singapore], Asian emerging countries [Thailand, Indonesia, Malaysia, the Philippines, Viet Nam, and India], and others), and the following as independent variables: the reason for selecting the sources (multiple choices allowed), awareness about the challenges involved in increasing the resilience of supply chains (multiple choices allowed), the number of employees, the industry sector (manufacturing and wholesale and retail trade), the country and region on which the level of dependency is high (China, Asian developed countries [Hong Kong, the ROK, Taiwan, and Singapore], Asian emerging countries [Thailand, Indonesia, Malaysia, the Philippines, Viet Nam, and India], and others), and the level of procurement dependency. When conducting the classification, it set the complexity parameter (cp) to 0.01, the maximum depth to 4, the minimum number of individuals for branching to 20, and the minimum number of individuals falling under each category to 7, and used the Gini coefficient to calculate the branching point.

Source: *REIWA 5 NENDO WAGAKUNI KIGYOU NO KAIGAI TENKAI NO JITTAI OYOBI KADAI NI KAKARU ANKEETO CHOUSA* (Tokyo Shoko Research, Ltd.).

2. Necessity of risk assessment on a global value chain-wide basis

Above, we looked at the situations of imports and Japanese global companies' procurement dependency on particular countries. However, unless we do not consider the situations on a supply chain wide-basis, including the situation of import and procurement sources' dependency on particular countries, efforts to diversify procurement sources remain superficial and provide no fundamental solution. As explained in Part I, Chapter 3, Section 3, the circumstances of global value chains can be identified by using the OECD's Trade in Value Added (TiVA) database. However, when we consider the risks inherent in and the resilience of global value chains, we can also conduct assessment based on overall trade value. Below, we will conduct analysis using the Foreign Production Exposure – Import

side (FPEM),[211] an indicator based on the value of gross output of intermediate inputs from abroad, which is described in the website of the OECD. We use gross output value as the basis of assessment based on the idea that when a supply disruption has occurred in a certain country that is located somewhere along a global value chain, the shock affects not only the value added created in that country but also gross output value, including the value added accumulated along the entire value chain. One major characteristic of the FPEM is that it measures the overall value of a country's exposure to inputs from abroad, known as "look-through" exposure, in terms of two different components, "face value" and "hidden exposure." "Face value" refers to intermediate inputs from countries that are direct suppliers as observed under ordinary trade statistics. That is distinguished from "hidden exposure," which refers to intermediate inputs from suppliers that are located beyond direct suppliers along the value chain flow and, therefore, cannot be accurately traced under ordinary trade statistics.[212]

Before conducting FPEM analysis, we provide an overview of the trade structures of major countries/regions regarding intermediate goods and services. Figure II-2-2-18 (1) describes the trade structures of major countries/regions regarding intermediate goods and services using the OECD Inter-Country Input-Output Tables. The size of the bubbles corresponds to the value of extra-regional trade in intermediate goods and services, while the direction and width of the arrow lines correspond to the destination and value, respectively, of exports of intermediate goods and services. The figure shows that the United States and Europe are closely related in terms of trade in intermediate goods and services, while Asian countries/regions, including China, ASEAN, India, the Republic of Korea (ROK), Taiwan, Hong Kong, and Japan are closely related in terms of such trade. However, as trade relationships are complexly interwoven, it is highly likely that intermediate goods and services traded between the United States and Europe are supplied via other countries/regions, including Asia. Figure II-2-2-18 (2) shows the shares of intermediate inputs from countries/regions in global output value. China accounts for the largest share, 13.3%, followed by the United States with 9.1% and the rest of the world with 3.6%. Meanwhile, according to Figure II-2-2-18 (3), which shows the shares of outputs of countries and regions in global output value, China accounts for the largest share, 22.0%, followed by the United

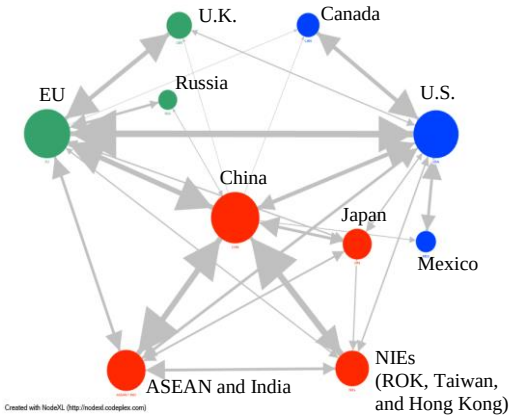
[211] For detailed information, see the website of the OECD indicated below. According to that website, these indicators are based on a research paper co-authored by Baldwin and others. On the site, four indicators, "FPEM," "FPEX," "FIR," and "FMR" are mentioned. Here, we used FPEM, which concerns intermediate inputs (https://www.oecd.org/industry/ind/gross-output-linkages-in-global-value-chains.htm) "Gross output flows in Global Value Chains: New indicators to evaluate countries' reliance on foreign intermediate inputs."

[212] Gross output value, expressed as the "look through" indicator under the FPEM approach, which is calculated using the Leontief inverse matrix based on the OECD's Input-Output table. "Face value," which corresponds to direct intermediate inputs, refers to the so-called primary ripple effect, the value of which is obtained by multiplying the value of demand by the input coefficient. "Hidden exposure," which corresponds to the secondary and less immediate ripple effects, is calculated by subtracting face value from look-through value. While the portion of intermediate inputs that is sourced from abroad is used in this analysis, the value of the portion that is sourced domestically in terms of "face value" and "hidden exposure" is also calculated and published on the website of the OECD (In the case of the portion that is sourced domestically, face value is added up with both the value of final demand and the primary effect). Naturally, the total sum of "face value" of intermediate inputs sourced domestically and from abroad and the value of "hidden exposure" regarding intermediate inputs sourced domestically and from abroad comes to 1.0 (100%).

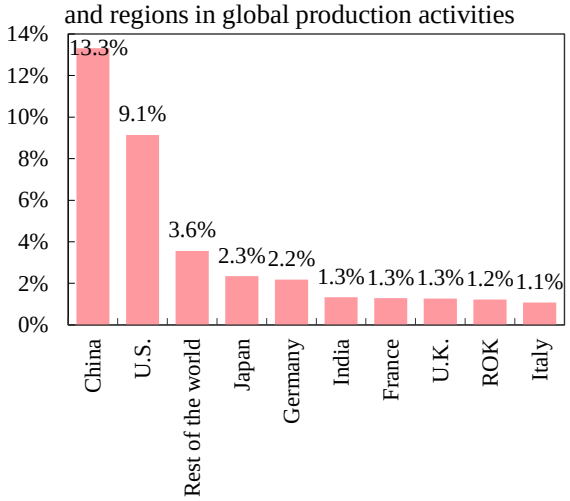
States with 21.5%, and the rest of the world with 6.1%. In short, China has a huge presence in terms of the value of both the output and input of intermediate goods.

Figure II-2-2-18. Trade structures of major countries and regions regarding intermediate goods and services

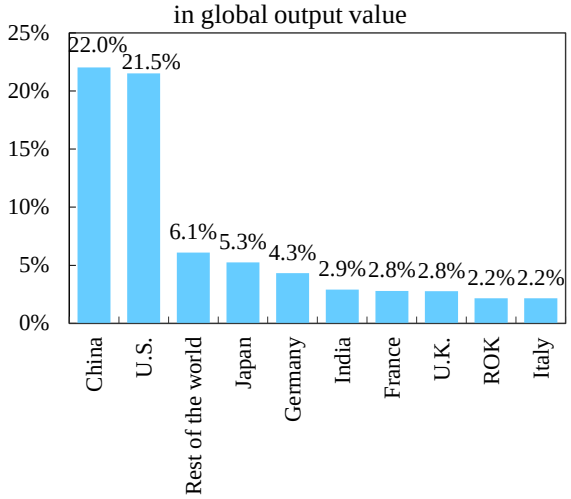
(1) Trade structures of major countries and regions regarding intermediate goods and services



(2) Shares of intermediate inputs from countries and regions in global production activities



(3) Shares of outputs of countries and regions in global output value



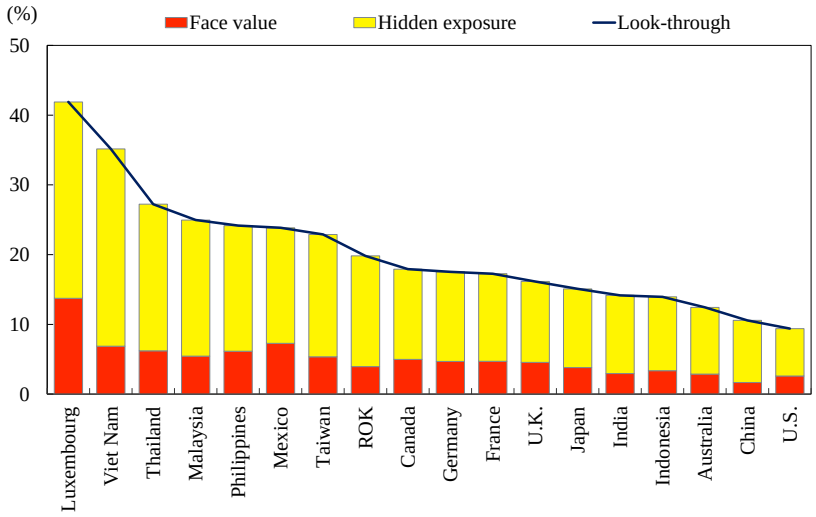
Note: The figures are based on the tables of transaction value (converted to US dollars) in 2020, which is the latest year for which data is available.

Source: *Inter-Country Input-Output (ICIO) Tables* (OECD).

Next, Figure II-2-2-19 compares major countries/regions in the status of intermediate inputs from abroad using the FPEM indicator. For all countries/regions, "hidden exposure" is larger than "face value," and this indicates that global value chains extend beyond the direct suppliers of intermediate goods observed under trade statistics. As a general rule, countries with a high level of economic openness and small economic size tends to show a high level of FPEM. Among the OECD member countries,

Luxemburg has the highest level of FPEM, while the United States has the lowest level.[213] Among major Asian countries/regions, the level of FPEM is high for Viet Nam, Thailand, Malaysia and the Philippines, and this lineup of countries is consistent with the lineup of countries that have a strong trade relationship of backward participation with China as explained in Part I, Chapter 3. While the level of FEPM is not necessarily high for Japan, the situation may be different if we focus attention on particular industries or goods. If Japan is excessively dependent on particular countries/regions, concerns may be raised about the resilience of Japanese companies' global value chains.

Figure II-2-2-19. Status of intermediate inputs from overseas in major countries and regions (2020/FPEM)



Source: The OECD website.

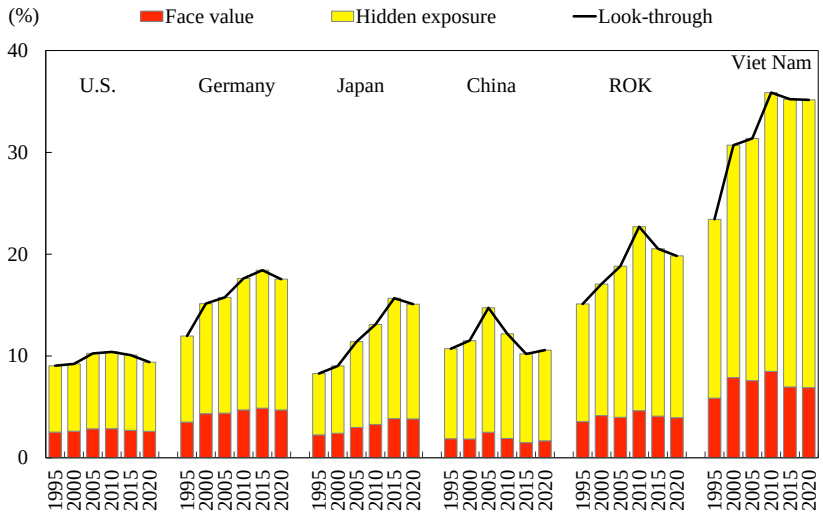
Therefore, we will look at the mix of countries serving as sources of intermediate inputs. As a preliminary step, let us look at time-sequential changes in the level of the FPEM indicator for some major countries. From 1995 to around 2010, the indicator rose in many countries (Figure II-2-2-20). In particular, "hidden exposure" was larger than "face value," and this indicates that during that period, global value chains were expanding. The FPEM level rose steeply in Japan and other Asian countries, where the system of international division of work was well developed compared with the rest of the world. However, after the beginning of the 2010s, the FPEM level started to level out as a trend, although the timing of the start of leveling out differed somewhat from country to country. In China in particular, the FPEM level started falling after peaking in 2005, and this indicates that, as a result of the progress in domestic industrial agglomeration, domestic production of necessary intermediate goods expanded in China.[214] On the other hand, the FPEM level in the United States does not appear to have changed

[213] The information was obtained from the website of the OECD mentioned earlier. For the FPEM analysis, data downloaded from that site on January 26, 2024, were used (https://www.oecd.org/industry/ind/gross-output-linkages-in-global-value-chains.htm).

[214] Production in China include production by both foreign and local companies. The decline in the FPEM level in China may also reflect the effects of the expansion of production of intermediate goods in

significantly, but we will look at specific overseas sources of inputs of intermediate goods in order to check whether or not there are concerns over the resilience of value chains.

Figure II-2-2-20. Changes in FPEM in major countries

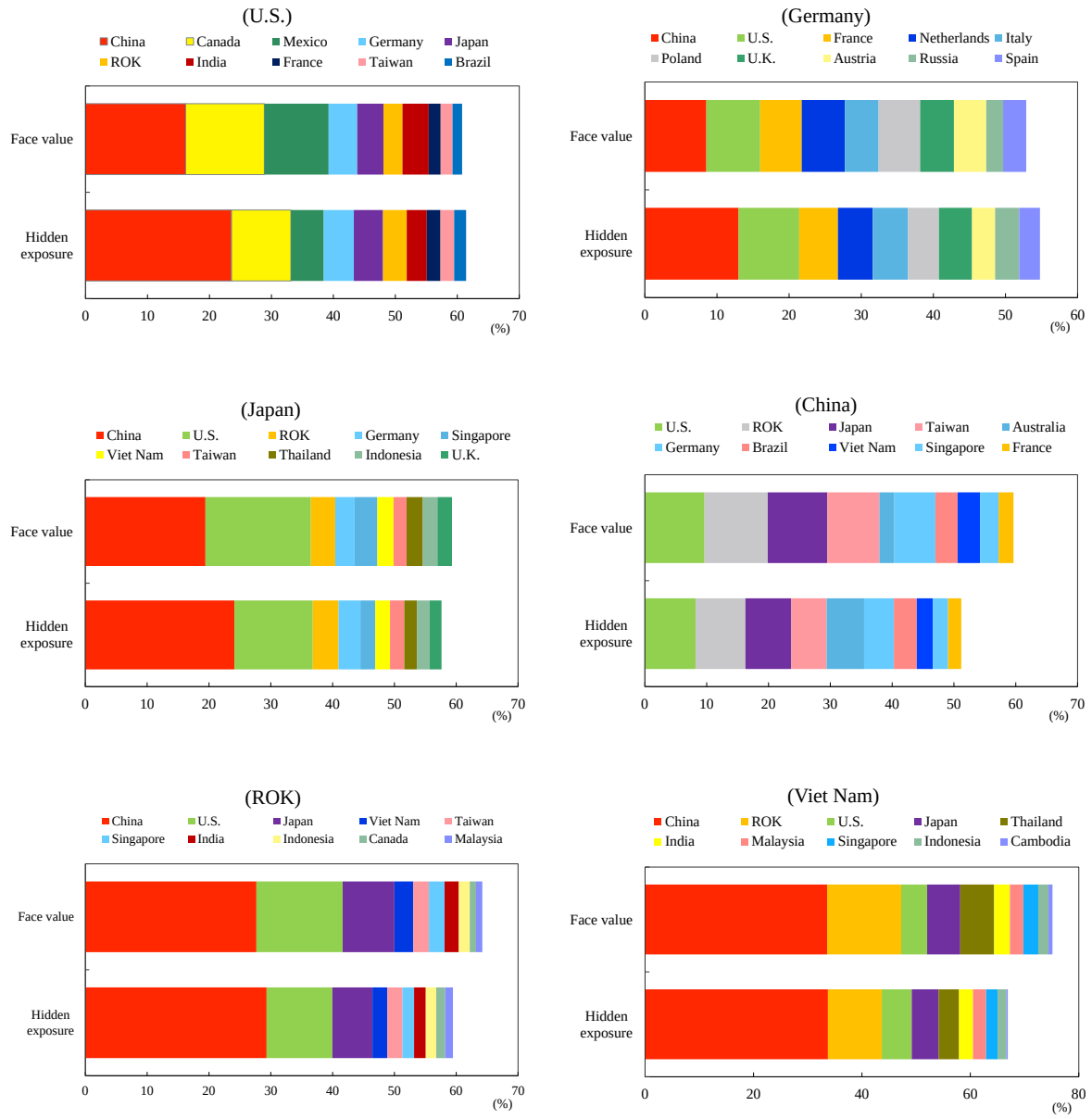


Source: The OECD website.

Figure II-2-2-21 shows the mix of countries/regions that served as sources of specific intermediate inputs in terms of "face value" and "hidden exposure" for some major countries, including the United States and Japan, in 2020. On the whole, neighboring countries/regions tend to have large shares as sources of intermediate inputs. For example, in the case of the United States, the level of dependency on Canada and Mexico is high, and in the case of Germany, the level of dependency on the United States and European countries is high. As for Japan, China, the ROK, and Viet Nam, the level of dependency on the United States and Asian countries and regions is high. However, the common thread across all those countries/regions, except China, is China's presence as the largest source of intermediate inputs in terms of both "face value" and "hidden exposure." In particular, China has a large presence in terms of "hidden exposure," which cannot be accurately traced under trade statistics, rather than "face value." For example, China, Canada, and Mexico are almost neck in neck as the major supply sources of intermediate inputs for the United States in terms of "face value." However, in terms of "hidden exposure," China is the largest supply source, leaving Canada and Mexico far behind. This means that China is not only a major direct supplier of intermediate goods but also has a significant presence as an indirect supplier that is located beyond direct suppliers along the flow of production processes with respect to goods that it does not directly supply, too.

China by foreign companies due to direct investments from Japan and other countries and the development of local companies due to the spillover effects thereof, among other factors.

Figure II-2-2-21. Status of intermediate inputs from overseas (mix of major countries and regions in FPEM)

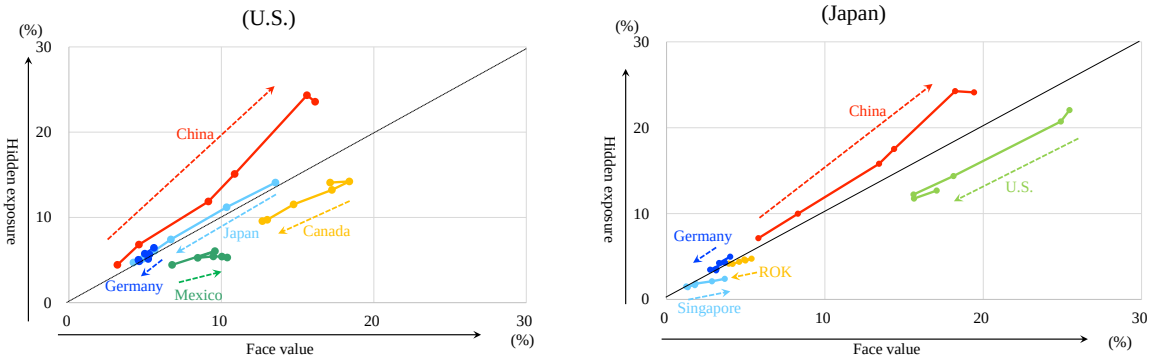


Note: The figures show major partner countries and regions (around 10 countries and regions) in terms of the "face value" and "hidden exposure" respectively from overseas sources as of 2020.
Source: The OECD website.

Let us check whether China's share as a supplier of intermediate goods has been large for many years by looking at Figure II-2-2-22, which shows the historical trend in China's share in inputs of intermediate goods supplied to the United States and Japan. In the case of supply to the United States, if we look back as far as 1995, Canada, Mexico, Japan and Germany had much larger shares than China as a supply source of intermediate goods. However, over the following 25 years, China's share expanded rapidly. As shown by this case, even when there has been no change in the level of the FPEM indicator on a global basis, a particular country may gain a disproportionate share as a source of intermediate

inputs. In the case of supply to Japan, too, China's presence expanded considerably over the 25-year period, overtaking the United States as the largest supply source.

Figure II-2-2-22. Changes in shares of major partner countries in terms of FEPM in the U.S. and Japan (1995→2000→2005→2010→2015→2020)



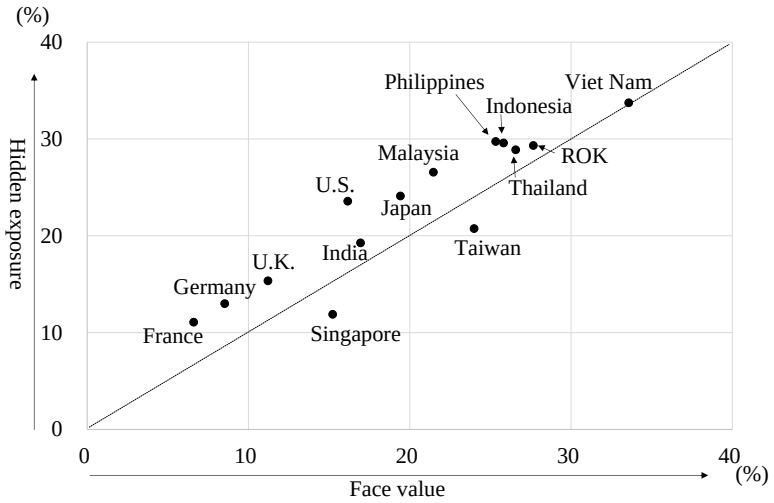
Note: The figures show the retrospective shares going back to 1995 of the five major partner countries as of 2020.

Source: The OECD website.

In 2020, China's share as a supply source of intermediate inputs in Germany and other European countries was not necessarily large, but it was larger in the United States and Asian countries/regions, including Japan. In particular, Viet Nam and ASEAN countries, which have a strong backward relationship with China, depended on China for nearly 30% of overall intermediate inputs (Figure II-2-2-23).[215]

[215] In the case of Indonesia, as shown by the Trade in Value Added statistics in Part I, Chapter 3, Section 1, the relationship of backward participation with China is not necessarily strong, but the FPEM level is high. One possible reason is that the OECD backward participation indicator and the FPEM use different assessment criteria. Regarding a country's exports, the backward participation indicator looks at how much of the value added created in the country's trade counterparty country is contained in exported items. On the other hand, the FPEM looks at how much of intermediate inputs sourced from the trade counterparty country is used in "domestic production activity." In the case of Indonesia, natural resources account for a large share in overall exports. Although the use of intermediate goods sourced from China for exporting natural resources may be limited, it is conceivable that Chinese intermediate goods are used in domestic production activity.

Figure II-2-2-23. Dependency on intermediate inputs from China (FPEM)



Note: This figure shows the shares of China in total intermediate inputs from overseas as of 2020.
Source: The OECD website.

To sum up the above FPEM analysis, one approach to measuring the resilience of global supply chains is to look at the resilience in terms of the share of intermediate goods sourced from abroad in the value of gross outputs necessary for domestic production. The use of this indicator will make it possible to consider resilience from the viewpoint of not only output value but also the extent of global value chains. It will also become possible to consider resilience from the viewpoint of supply of intermediate goods from two different categories of supplier countries, that is, direct and indirect suppliers. If the FPEM, one indicator to measure resilience from that viewpoint, is used, it becomes clear that regarding intermediate inputs from abroad, in many countries, indirect inputs in particular increased until around 2010 but leveled out thereafter. In the meantime, however, the mix of supplier countries of intermediate inputs changed significantly in some countries, including Japan and the United States, with intermediate inputs from China growing rapidly. Intermediate inputs from China increased in terms of both direct and indirect supply, but the value of indirect supply is larger. In 2020, the value of intermediate inputs from China was not necessarily large in Germany and other European countries but was larger in the United States and Asian countries/regions, including Japan. In particular, ASEAN countries depended on China for around 30% of overall intermediate inputs.

This section looked at what actions Japanese companies should take amid the derisking trend. When considering derisking, it is important to give consideration to entire value chains, rather than only some particular parts of the chains. The OECD's Trade in Value Added statistics and the FPEM and other recently developed indicators provide effective means to make visible developments that we have been unable to describe in detail while being aware of the risks involved.