Section 2 The global supply-chain originating from Japan, recognition of which is renewed clearly through the earthquake damage

1. The influence that regional economies of Japan exert on the global supply-chain

(1) The global supply-chains, which are established according to each export item and region

In this section, at first we will demonstrate that there are slight variations between the global supply-chains, which are established separately according to the items exported from Japan and regions, and linked with various countries/regions of the world. Then we will analyze these facts, taking the automobile parts and electronic parts, the representative products export of which from Japan has a significant influence as an example.

(A) Structure of the global supply-chain of the automobile parts that is originating from Japan

There are some characteristics found in the items and the regions in the world of which influence on global supply-chain created worries just after this earthquake disaster. Particularly, these are relatively apparent in export for automobile parts to Europe and U.S.A. (especially to United States). On the other hand, in the Asian region, some people expect increase of receiving of order by means of the substitute production and reconstruction demand to be caused by this earthquake disaster. To inspect the connection between Japanese export of automobile parts[1] and supply chains with the world, we compared domestic areas of origin[2] of direct export to major export destination, using the foreign trade statistics of 2010 (Table 4-2-1-1). The total sum of export of automobile parts from Japan is approximately 3 trillion yen, and the biggest export area is Chubu area (export share 48.2%), followed by Kanto area (35.5%). The export from the above top two areas accounts for over 80%. The top two areas are followed by Kinki area (7.4%), and Chugoku area (5.9%) in that order. The (direct) export amount from Tohoku area is around 10 billion yen (0.3%)[3]. As for the export unit price export products from Chubu area and Chugoku area is higher

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[1] We extracted 70505 (car component) export amount of the Principal Commodity cord, from Ministry of Finance "foreign trade statistics" (Customs list by Principal Commodity by country). It is the total of 8707 (the body) and 8708 (component and accessories) with four digits of HS cord bases.

[2] The domestic areas are classified by the location of the customs of the export.
As for the area classification, we use the same area classification as in the classification of the district under jurisdiction of Bureau of Economy, Trade and Industry. This is because we analyze the Inter-regional I/O table (Chiikikan Sangyokanrenhyo) in the later section.
The details are as follows;
Hokkaido area: Hokkaido
Tohoku area: Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima
Kanto area: Ibaraki prefecture, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Yamanashi, Nagano, Shizuoka
Chubu area: Toyama, Ishikawa, Gifu, Aichi, Mie
Kinki area: Fukui, Shiga, Kyoto, Osaka, Hyogo, Nara, Wakayama
Chugoku area: Tottori, Shimane, Okayama, Hiroshima, Yamaguchi
Shikoku area: Tokushima, Kagawa, Ehime, Kochi
Kyushu area: Fukuoka, Saga, Nagasaki, Kumamoto, Oita, Miyazaki, Kagoshima
Okinawa area: Okinawa prefecture

[3] Whole export amount from Tohoku area that we estimated in Table 4-1-2-7 of the foregoing paragraph(based on place of production) is approximately 35 billion yen, and this is almost conformal

in the price in comparison with that of other areas.

Table 4-2-1-1 Japanese export of automobile parts by region (2010 total)

Exporting area	Export value (hundred million yen)	Percentage (%)	Unit price (1,000 yen/kg)
Hokkaido	449	1.5%	1.02
Tohoku	105	0.3%	0.58
Kanto	10,947	35.5%	0.96
Chubu	14,861	48.2%	1.23
Kinki	2,272	7.4%	0.90
Chugoku	1,824	5.9%	1.15
Shikoku	2	0.0%	0.35
Kyushu	372	1.2%	0.55
Okinawa	1	0.0%	0.08
Whole country total	30,833	100.0%	1.07

Notes: Total of share may not become 100% due to rounding off.
Source: "Foreign trade statistics" (2010 total amount) (Ministry of Finance)

Now, let us see the major export destinations (Table 4-2-1-2). The two major export destination countries from Japan are China (export amount approximately 690 billion yen, export share 22.4%) and the United States (approximately 670 billion yen, 21.6%), and the amounts are almost in the same level as of 2010. As to the region, NAFTA is the largest export destination area (export share 29.8%). NAFTA's member countries include Mexico and Canada both of which are ranked in top 10 export destination countries. The following major export destinations include ASEAN4 (16.1%) in which Thailand, Indonesia and Malaysia are the member countries, EU27 (12.9%), U.K. and the Netherlands are member countries, NIEs (6.1%) South Korea is a member country. Below, we compare areas of origin of export for; (a) United States and NAFTA, (b) China, (c) EU27, and (d) NIEs and ASEAN4 (Table 4-2-1-3).

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with the result that the export from the port of Tohoku region is approximately a quarter in the total.

Table 4-2-1-2 Major export destination countries/regions of Japanese

Ranking	Export destination countries/regions	Export value (hundred million yen)	Percentage (%)
	Whole world total	30,833	100.0%
1	China	6,912	22.4%
2	U.S.A.	6,653	21.6%
3	Thailand	2,582	8.4%
4	Mexico	1,497	4.9%
5	Indonesia	1,191	3.9%
6	South Korea	1,102	3.6%
7	Canada	1,032	3.3%
8	U.K.	1,007	3.3%
9	Netherlands	898	2.9%
10	Malaysia	873	2.8%
	NAFTA	9,182	29.8%
	ASEAN4	4,979	16.1%
	EU27	3,981	12.9%
	NIEs	1,880	6.1%

Notes: Analysis are performed on countries/regions that are shaded.
Source: "Foreign trade statistics" (2010 total amount)(Ministry of Finance)

Table 4-2-1-3 Share of automobile parts exported from various domestic regions, in the export to various countries/regions of the world (2010 total)

Export direction	Whole world	NAFTA	USA	China	ASEAN4	NIEs	EU27
Export value (hundred million yen)	30,833	9,182	6,653	6,912	4,979	1,880	3,981
Export percentage	100.0%	29.8%	21.6%	22.4%	16.1%	6.1%	12.9%
Export unit price	1.07	1.12	1.17	1.26	0.90	1.07	1.14
Exporting area	Percentage of various regions in export from Japan						
Hokkaido	1.5%	4.4%	4.2%	0.2%	0.2%	0.1%	0.3%
Tohoku	0.3%	0.7%	1.0%	0.2%	0.1%	0.0%	0.3%
Kanto	35.5%	44.5%	46.1%	27.4%	41.2%	29.1%	30.9%
Chubu	48.2%	41.2%	37.4%	56.7%	35.2%	41.9%	59.7%
Kinki	7.4%	5.4%	7.2%	2.3%	16.0%	17.5%	5.2%
Chugoku	5.9%	2.6%	2.7%	11.4%	6.1%	9.5%	3.4%
Kyushu	1.2%	1.2%	1.3%	1.8%	1.3%	1.8%	0.2%

Notes: Shikoku region and Okinawa region, are omitted from the table, as all the shares in the export are less than 0.1%. The regions which are shaded indicate that the regions which share in the export for various regions is higher than the share in the export for whole world. Total of share may not become 100% due to rounding off.
The unit of export unit price is 1,000 yen/kg.
Source: "Foreign trade statistics" (2010 total amount) (Ministry of Finance)

As for the export for United States and NAFTA, the export from Kanto area (export share 46.1% for United States) is more than the export from the Chubu area (37.4%), and is in reverse order as for proportion of the export for entire world. And also, the share of export from Hokkaido and Tohoku area, northern area to Kanto is higher than a share of the export for whole world from the area concerned. As for the export for China, the export from Chubu area (export share 56.7%) is considerably more than export from the Kanto area (27.4%), and this is conformal with the share according to the area of the export for whole world; that is the export from the Chubu area is more. Moreover, in the area from Chubu and to the west except Kinki area, share of export from Chugoku

area and Kyushu area is higher than the share of export from the area for whole world. It may be said that export from West Japan relatively increases. In addition, the export unit price for China is 1,260 yen/kg, which is not so much inferior to the export unit price for United States (1,170 yen/kg).

As for the export for EU27, export from Chubu area (export share 59.7%) is more than that from Kanto area (30.9%), this structure is conformal with the order of the export share for whole world as in export for China. The export ratio from the Chubu area further increases more than that in the case of products for China, showing dominant position of Chubu area.

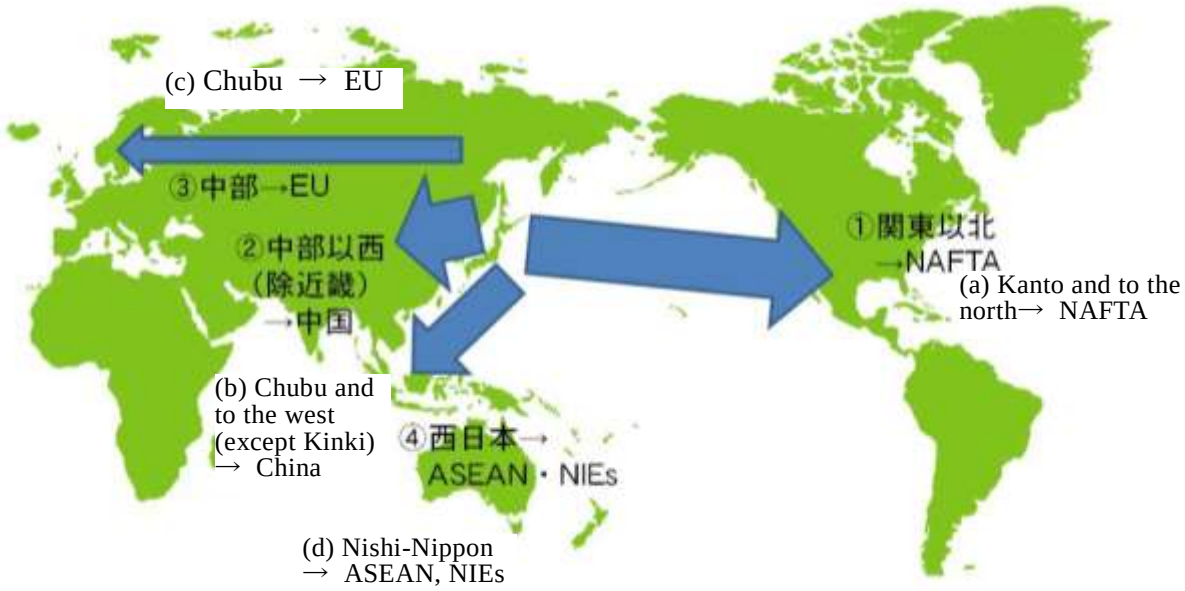
Finally in terms of export for ASEAN4 and NIEs, export from the Chubu area has relatively small proportion, which is less than a share of the export for whole world (for ASEAN4 35.2%, for NIEs 41.9%). Moreover, in Kanto area although export to ASEAN4 is larger compared with Chubu area (export share 41.2%), export for NIEs is relatively small (29.1%). In place of these two major exporting areas, share of the export from West Japan such as Kinki, Chugoku and Kyushu area is characteristically higher than the share of export from the area for whole world. In addition, the export unit price is in the low level as a whole in comparison with products for Europe and U.S.A. and for China.

Below is a summary about the links of the export of automobile parts according to areas of Japan with the supply chain of country/region in the world, as taken from the above data. It is confirmed that; (a) United States, NAFTA are relatively strong in the connection with areas from Kanto area and to the north, (b) China is relatively strong in terms of areas from Chubu area and to the west except Kinki area, (c) EU27 is relatively strong in Chubu area, (d) ASEAN4, NIEs are strong in the West Japan area (Figure 4-2-1-4).

Due to these characteristics of the export structure of Japanese automobile parts, Influence on the global supply-chains connected in each country/region which is originating from Japan caused by this earthquake disaster is considered to change little by little in its aspect. In addition, for factors which determine the export structure, various factors are considered such as the difference in strategy of companies located in the individual area for various countries/regions, the difference in development of the international distribution network[4] the difference in exported products, etc.

[4] In international routes of the transport by sea, the route from Japan for North America has many services from the East Japan area, and the route for China and other Asia has equal number of services from the West Japan area. This is regarded as one reason.
(From Ministry of Land, Infrastructure and Transport (2010) "Number of service (service/week) of regular overseas trade container calling at Japan").

Figure 4-2-1-4 Image of the global supply-chain of automobile parts originated from Japan



(B) Structure of global supply-chain of electronic parts originating from Japan

Next, as for the export of electronic parts like semiconductors (hereafter to be referred to as electronic parts) of Japan[5], we compare the domestic area, which is the origin of direct export to main export destinations. This will be helpful in order to understand the links with supply chains of the world, and for this, we will apply the same method as in the case of automobile parts (Table 4-2-1-5).

Table 4-2-1-5 Japanese export of electronic parts by region (2010 total)

Exporting area	Export value (hundred million yen)	Export value (hundred million yen)
Hokkaido	3	0.0%
Tohoku	158	0.4%
Kanto	15,972	38.5%
Chubu	3,268	7.9%
Kinki	18,303	44.1%
Chugoku	107	0.3%
Shikoku	86	0.2%
Kyushu	3,600	8.7%
Okinawa	31	0.1%
Total whole country	41,528	100.0%

Notes: Total of share may not become 100% due to rounding off.
Source: "Foreign trade statistics" (2010 total amount) (Ministry of Finance)

[5] We extracted 70323 (semiconductors etc.) export amount of the P.C. Code, from Ministry of Finance "foreign trade statistics" (Customs list by country by Principal Commodity).
By HS cord basis, the data is the total of 852352 (IC cards), 8540 (thermionic tubes), 8541 (individual semiconductor such as diode and transistor), and 8542 (integrated circuits such as IC card). Adding up of the amount is not possible because there are too many types of products, and the calculation of the product unit price is not possible.

The total sum of export of electronic parts for the whole world amount to approximately 4 trillion yen, approximately 1 trillion yen more compared with export of automobile parts. The largest exporting area is Kinki area (export share 44.1%), followed by Kanto area (38.5%). Export from these two major exporting areas exceeds 1,500 billion yen each and account for over 80% in the whole. The two areas are followed by Kyushu area (8.7%), and Chubu area (7.9%) in that order, and the export from Tohoku area is approximately 16 billion yen, accounting for 0.4% of the whole. The role that Chubu area undertakes as the largest exporting area of automobile parts is taken by Kinki area in the electronic parts, and Kanto area occupies the next position as same as for export of both parts.

As for the main export destination (Table 4-2-1-6), the largest export destination from Japan is China (export amount approximately 1,040 billion yen, export share 25.1%), and the largest export destination region is NIEs (approximately 1,720 billion yen, 41.5%). As for the region, main export destination regions are ASEAN4 (export share 15.9%), with Malaysia, Thailand and Philippines in the member nations are in the top 10 export destination nations, NAFTA (7.4%) with United States is in the top 10, and EU27 (7.4%) with Germany is in the top 10. Below, we compare areas of origin of export for; (a) China, (b) NIEs and ASEAN4 (c) United States and NAFTA, and (d) EU27 (Table 4-2-1-7).

Table 4-2-1-6 The major export destination countries/regions of electronic parts of Japan (2010 total)

Ranking	Export destination country /region	Export value (hundred million yen)	Export value (hundred million yen)
	Whole world total	41,528	100.0%
1	China	10,434	25.1%
2	Taiwan	6,536	15.7%
3	Hong Kong	5,281	12.7%
4	Singapore	3,057	7.4%
5	U.S.A.	2,681	6.5%
6	Malaysia	2,576	6.2%
7	Thailand	2,467	5.9%
8	South Korea	2,351	5.7%
9	Germany	1,229	3.0%
10	Philippines	1,177	2.8%
	NIEs	17,224	41.5%
	ASEAN4	6,613	15.9%
	EU27	3,074	7.4%
	NAFTA	3,073	7.4%

Notes: Analysis are performed on countries/regions that are shaded.
Source: "Foreign trade statistics" (2010 total amount) (Ministry of Finance)

Table 4-2-1-7 Share of electronic parts exported from various domestic regions, in the export to various countries/regions of the world (2010 total)

Export direction	Whole world	NAFTA	USA	China	ASEAN4	NIEs	EU27
Export value (hundred million yen)	41,528	3,073	2,681	10,434	6,613	17,224	3,074
Export percentage	100.0%	7.4%	6.5%	25.1%	15.9%	41.5%	7.4%
Exporting area	Percentage of various regions in export from Japan						
Hokkaido	0.0%	－	－	0.0%	0.0%	0.0%	0.0%
Tohoku	0.4%	0.9%	1.0%	0.7%	0.2%	0.1%	0.0%
Kanto	38.5%	46.2%	50.3%	35.3%	41.3%	38.7%	31.4%
Chubu	7.9%	12.0%	12.5%	8.5%	15.9%	3.0%	6.1%
Kinki	44.1%	37.4%	32.2%	42.0%	32.9%	50.3%	53.5%
Chugoku	0.3%	－	－	0.9%	0.0%	0.1%	0.0%
Shikoku	0.2%	0.0%	0.0%	0.5%	0.4%	0.0%	0.1%
Kyushu	8.7%	3.5%	3.9%	12.1%	9.3%	7.6%	8.9%
Okinawa	0.1%	－	－	－	－	0.2%	－

Notes: The regions which are shaded indicate that the regions which share in the export for various regions is higher than the share in the export for whole world. Total of share may not become 100% due to rounding off. Comparisons of 0.0% means that comparison is performed in the number of 2 digits after decimal point

Source: "Foreign trade statistics" (2010 total amount)(Ministry of Finance)

First, as for the export to China, which is, the largest export destination, export from two major exporting areas, the Kinki area (export share 42.0%) and Kanto area (35.3%), marks lower proportion compared with export for the whole world, under 80% in total On the other hand, the other areas including Kyushu account for relatively high export proportion. This means that export for China is widely made from various Japanese areas.

Next as for the export for NIEs, which is the largest regional export destination, export from Kinki area (50.3%) and Kanto area (38.7%) account for approximately 90% of its trade with this region, and both areas have higher share in export for whole world. Export from other areas is relatively small. On the other hand, as for the export for ASEAN4, Kinki area's share (32.9%) in export is relatively low, Kanto area (41.3%) has the largest share, and this is in reverse order as for proportion of the export for entire world. Moreover, export from the Chubu and Kyushu areas has a higher proportion compared with the share of export for whole world from the relevant areas. As mentioned above, the structure of export for Asia of electronic parts is not uniform and it slightly varies according to country/region.

As for the export for United States and NAFTA, the export from Kanto area (export share 50.3% for United States) is more than the export from Kinki area (32.2%), and as in the case of export for ASEAN4, this is in reverse order as for proportion of export to entire world. This shows the same structure as in the case of exports from Kanto area, which is the largest in the export for United States of automobile parts. Moreover, export from Tohoku area and Chubu area also has a higher proportion compared with the share of export for whole world from the relevant areas. On the contrary, the export from Kinki area and to the west has relatively small proportion.

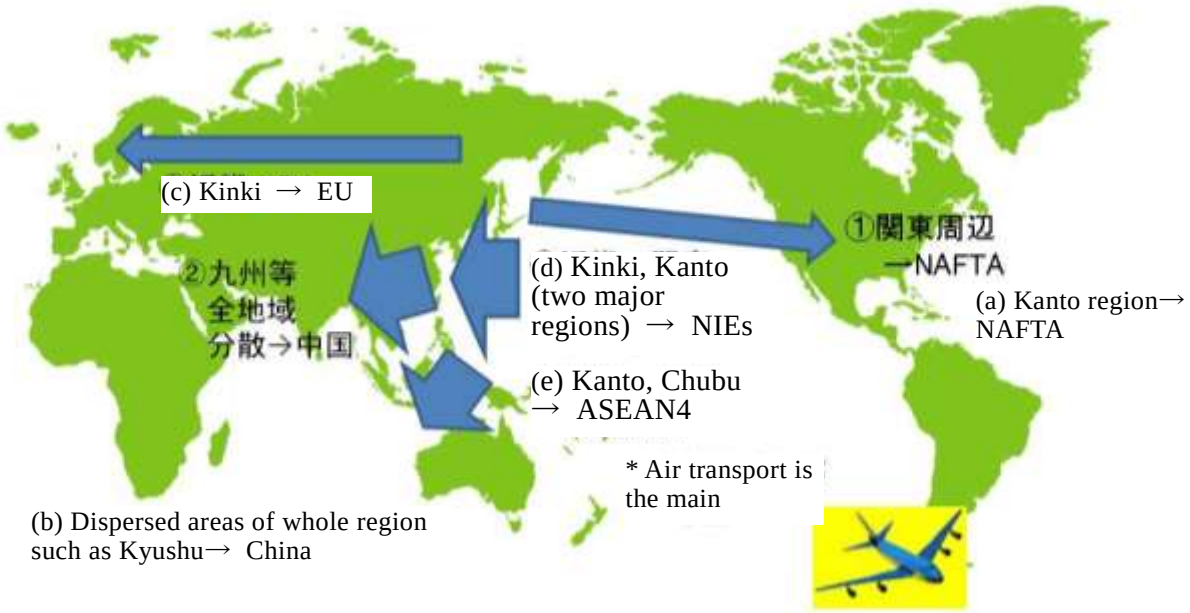
Finally, export from Kinki area (export share 53.5%) is considerably more than export from the

Kanto area (31.4%), and this is conformal with the share of the export for the whole world. Export from Kinki area accounts for more than half, and exporting makers are is more concentrated in the area. Moreover, export from the areas other than Chubu area except Kyushu area has a lower proportion compared with the share of export for whole world from the relevant areas. This is the similar structure like the export for EU of automobile parts, too.

Below is a summary about the links of the export of electronic parts according to areas of the Japan with the supply chain of country/region in the world, taken from the above data. It is noted that; (a) United States, NAFTA are relatively strong in the connection with the neighborhood area of Kanto, (b) China has relatively a connection widely with the whole domestic area including Kyushu area as well as Kinki and Kanto area. (c) EU27 is relatively strong in the connection with Kinki area, (d) NIEs is relatively strong in connections with the two major areas of Kinki and Kanto area, (e) ASEAN4 is relatively strong in the connection with Kanto area and Chubu area. Besides, in the nature of the product, the transportation ratio as the air cargo is high[6] (Figure 4-2-1-8). In comparison with export structure of the automobile parts, the electronic parts include a variety of items, and also wide use. Accordingly such the definite export structure as in the case of automobile parts cannot be observed, particularly in the export for various Asian areas. However, about export for Europe and the U.S.A., the following is in common; Export for United States and NAFTA is made mainly around Kanto, and Export for EU27 has a big proportion in the largest exporting area (in the case of electronic parts- Kinki area, and for automobile parts- Chubu area). Besides, the facts that origin of export of total electronic parts is mainly West Japan such as Kinki area and Kyushu area, is considered to have something to do with the influence on the global supply-chain by this earthquake disaster.

[6] The electronic parts like semiconductor etc., due to its product nature , are often exported as air cargo via the airports. Approximately 70% of all are exported from various international airports including Narita Airport and Kansai Airport.

Figure 4-2-1-8 Image of the global supply-chain of electronic parts originated from Japan



Source: Compiled from the data of Ministry of Economy, Trade and Industry.

(C) The export structure of automotive IC tips from Japan

As for the influence on global supply-chain by this earthquake disaster in relation to electronic parts, more serious Influence is added to car industry than to the electronic industry.

Particularly, the supply system of automotive IC tip[7] drew attention. In case of the disaster in the past, discontinued production of parts has affected the domestic and foreign supply chains of the car industry. For example, in the case of The Niigata-ken Chuetsu-oki Earthquake occurred in 2007, a production factory (located in Kashiwazaki-shi, Niigata) of piston ring[8] which is an indispensable part for the production of automobile suffered damage, the supply of the part stopped temporarily, resulting in great impact on entire automobile production. In the case of this earthquake disaster, since automotive IC tips factory is located in the disaster-stricken area (Ibaraki prefecture), the supply of the part stopped temporarily resulting in similar great impact on entire automobile production. Therefore about the export of microcontroller (hereafter a microcomputer) including the automotive IC tip from Japan, in order to understand the links with supply chains of the world, using the same method as before, we compared domestic areas of origin of export to

[7] The IC tip used in automobile is a kind of the microcomputer (microcontroller unit: often abbreviated as MCU). It is difficult to grasp the IC tip for automobile as an export item from all the microcomputers. Microcomputers are used in wide range, from the household electrical appliance such as cell-phone, wireless remote controllers of TV to engine control system of the car.(It is said that approximately 150 MCUs are used in one standard household, and approximately 60 MCUs are used in one car in an average). The company having the factory suffered by this earthquake disaster is the world's largest company in the microcomputer production, and is believed to have 60% of domestic shares, 30% of world shares in the microcomputer market. Moreover, the use of microcomputer incorporated in an automobile includes Engine control, Electronic control suspension, An anti-lock braking system (ABS), Power steering, Power window, Air bag control, Windshield wiper control, and keyless entry.

[8] The piston ring is a ring-shaped part used for the engine for automobiles etc., and its function is to seal the combustion gases chamber in the piston and release the heat in the cylinder.

major export destinations (Table 4-2-1-9)[9].

Table 4-2-1-9 Japanese export of microcomputers by region (2010 total)

Exporting area	Export value (hundred million yen)	Percentage (%)	Unit price (yen/unit)
Hokkaido	－	－	－
Tohoku	1	0.0%	147
Kanto	1,168	65.2%	165
Chubu	135	7.6%	176
Kinki	314	17.5%	150
Chugoku	2	0.1%	194
Shikoku	4	0.2%	93
Kyushu	166	9.3%	156
Okinawa	－	－	－
Whole country total	1,790	100.0%	162

Notes: Total of share may not become 100% due to rounding off.
Source: "Foreign trade statistics" (2010 total amount)(Ministry of Finance)

The export of microcomputers from Japan is approximately 180 billion yen, account for approximately 4.3% of export of electronic parts of more than 4 trillion yen[10]. By region, export from Kanto area is the largest, accounting for 65.2% of the total, followed by Kinki area (17.5%) and Kyushu area (9.3%) in that order. This is in contrast to the case that Kinki area has the largest proportion in the total electronic parts export, and Chubu area has the largest in total automobile parts export. In addition, in terms of the export unit price from the origin of major exporting manufactures, the price of export product from Chubu area is relatively high, followed by Kanto area.

As for the major export destination country/region of the microcomputer (Table 4-2-1-10) the share of export for NIEs is the largest, approximately 40% (38.4%), followed by export for EU27 (22.4%), for China (16.2%), for NAFTA (15.2% of which 14.7% for United States) and for ASEAN4 (7.0%). More than 99% of the export for the whole world is made for the above countries and regions. In addition, in comparison with the export of whole electronic parts, the proportion of the export for Europe and U.S.A. (NAFTA and EU27) is high. (export of entire electronic parts, proportion of both region is the same, i.e.7.4%). Below, we compared areas of origin of export for; (a) United States, NAFTA, and EU 27 - unit price of export products are relatively high, and (b) NIEs, ASEAN4 and China - unit price of export products are relatively low (Table 4-2-1-11).

[9] Source: Ministry of Finance "foreign trade statistics" (List of Country Customs by Commodity Statistics). The most detailed HS cord 9-digit classification: 854231992 (MCU: microcontroller) is used. This item is a part of integrated circuits (IC) (HS8542) in the processor controller (HS854231).

[10] The microcomputer like electronic parts in general, in the nature of the product, is often exported as air cargo via airport. Export from Narita Airport accounts for approximately 60%, and the export amount accounts for approximately 70%, if Kansai Airport is included.

Table 4-2-1-10 The major export destination countries/regions of microcomputer of Japan (2010 total)

Ranking	Export destination countries/regions	Export value (hundred million yen)	Percentage (%)
	Whole world total	1,790	100.0%
1	Hong Kong	327	18.2%
2	Chugoku	290	16.2%
3	U.S.A.	263	14.7%
4	Singapore	217	12.1%
5	Germany	200	11.2%
6	Netherlands	176	9.8%
7	South Korea	83	4.7%
8	Thailand	69	3.9%
9	Taiwan	61	3.4%
10	Malaysia	26	1.5%
10	Philippines	26	1.4%
	NIEs	687	38.4%
	EU27	400	22.4%
	NAFTA	272	15.2%
	ASEAN4	125	7.0%

Notes: Analysis are performed on countries/regions that are shaded.
Source: "Foreign trade statistics" (2010 total amount) (Ministry of Finance)

Table 4-2-1-11 Share of microcomputers exported from various domestic regions, in the export to various countries/regions of the world (2010 total)

Export direction	Whole world	NAFTA	USA	China	ASEAN4	NIEs	EU27
Export value (hundred million yen)	1,790	272	263	290	125	687	400
Export percentage	100.0%	15.2%	14.7%	16.2%	7.0%	38.4%	22.4%
Export unit price	162	204	202	148	121	139	229
Exporting area	Percentage of various regions in export from Japan						
Tohoku	0.0%	－	－	0.3%	0.1%	0.0%	－
Kanto	65.2%	64.6%	65.3%	46.5%	47.5%	71.2%	75.9%
Chubu	7.6%	18.8%	19.3%	11.3%	16.3%	0.8%	3.9%
Kinki	17.5%	7.2%	5.7%	36.3%	31.7%	20.0%	2.6%
Chugoku	0.1%	－	－	0.5%	0.3%	0.0%	－
Shikoku	0.2%	－	－	0.0%	3.2%	0.0%	－
Kyushu	9.3%	9.4%	9.7%	5.1%	0.8%	8.0%	17.5%

Notes: Hokkaido region and Okinawa region are omitted from the table as no export from the regions. The regions which are shaded indicate that the regions which share in the export for various regions is higher than the share in the export for whole world. Total of share may not become 100% due to rounding off. Comparisons of 0.0% means that comparison is performed in the number of 2 digits after decimal point
Unit of export unit price is yen/unit.
Source: "Foreign trade statistics" (2010 total amount) (Ministry of Finance)

As the characteristic of the export of microcomputers for Europe and U.S.A., export from the Kanto area has the largest like a share among the export for whole world (export share is 65.3% for EU27 and 75.9% for United States). And microcomputers of high unit product cost are exported from Chubu area, which account for nearly 20% (19.3%), particularly in the export for United

States.[11] As other characteristics, export share from Kyushu area is relatively high, and from Kinki area relatively low. On the other hand, as the characteristic of the export for Asia, export from Kanto area is less than half in the product for China and ASEAN4, and relatively small proportion in comparison with export share for the whole world. On the other hand, the export for NIEs is more than 70% of the export for Europe and U.S.A. And export share from Kinki area is more than share of export from the area for the whole world, accounting for 30% level in the export to China and ASEAN4.

Summary of the export structure of the microcomputer shows that there is large amount of export to Asia such as NIEs, but large amount is exported to Europe and U.S.A. in comparison with the whole electronic parts export (especially export to EU27 is larger than that to NAFTA), The construction of this export is similar to that in export destination of the automobile parts. And also, in terms of origin of export Kanto area is the largest in the export to every region. This is in contrast to the case that Kanto area is the second largest exporting area in the whole electronic parts (largest is Kinki area) and in automobile parts (largest is Chubu area). Particularly, the automotive IC tips which is said to be high value added product in the microcomputer are exported a lot for the Europe and the U.S.A., and since export share from Kanto area to these areas is high, it is considered that the export structure of the microcomputer relates to Influence on the global supply-chain by this earthquake disaster.

(2) A meaning of the global supply-chain judging from the situation of the inventory control

As in the above, we clarified that there are slight variations between the global supply-chains which are established separately according to the items exported and regions, and linked with various countries/regions of the world, and the uneven distribution in export destination and region of origin of export of microcomputer used for automotive IC tip in the automobile parts and electronic parts, have affected the global supply-chain by this earthquake disaster.

In the following, as another viewpoint, we demonstrate that there are great differences between industries in Japan, judging from the situation of stock, particularly stock situation of parts, which affect the amount of circulation in the global supply-chain.

Using a Financial Statements Statistics of Corporations by Industry survey, we compared the difference between latest inventory-sales ratio (the end of 2009) and inventory-sales ratio (raw materials, goods in process inventory-sales ratio and product inventory-sales ratio[12]) in all

[11] The unit product cost of the export for United States from Chubu area is 570 yen/ piece (the export amount approximately 5,100 million yen). The unit product cost of the export for EU is 667 yen/ piece (export amount approximately 1,600 million yen). The unit product cost of the export for United States from the Kanto area is 174 yen/ piece (export amount approximately 17,200 million yen). The unit product cost of the export for EU is 242 yen/ piece (export amount approximately 30,400 million yen).

[12] Using annual survey (2009) of the Ministry of Finance "Financial Statements Statistics of Corporations", we performed the calculations of the under mentioned mathematical formula. for the following industries: Total main manufacturing industries (manufacture of pulp, paper and paper products) manufacture of chemical, manufacture of petroleum and coal products, manufacture of ceramic, stone and clay products, manufacture of iron and steel, manufacture of non-ferrous metals and products, manufacture of fabricated metal products. manufacture of general machinery,

production process, by business category of the main manufacturing industry (Table 4-2-1-12). As the result, the inventory-sales ratio of automobile and accessories manufacturing industry, the raw materials/goods in process inventory-sales ratio is 3.0% (approximately 10.8 days worth), product inventory-sales ratio is 1.7% (approximately 6.2 days worth), the total of inventory-sales ratio with combination of both is 4.6% (approximately 17.0 days worth), which is the lowest value in the main manufacturing industries [13]. In contrast, in the Manufacture of information and communication electronics equipment including electronic parts, device, electronic circuit manufacturers, raw materials/goods in process inventory-sales ratio is 5.1% (approximately 18.6 days worth), product inventory-sales ratio is 2.4% (approximately 8.9 days worth), total inventory-sales ratio is 7.5% (approximately 27.5 days). All these values are next to motor vehicles, parts and accessories, but each value is more than in the motor vehicles, parts and accessories. The other manufacturing industries have higher inventory-sales ratio than the above two industries. manufacture of general machinery and manufacture of production machinery which were classified as General machine appliance manufacturing industry conventionally and manufacture of iron and steel, manufacture of chemical and manufacture of non-ferrous metals and products, so-called process type industry have high inventory-sales ratio in general. On the other hand, from the inventory-sales ratio and inventory-sales ratio by production process in the chronological order for the car industry and electric machine industry (former classification of Manufacture of information and communication electronics equipment) (Figure 4-2-1-13), we can understand characteristics of

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manufacture of production equipment, manufacture of industrial equipment, manufacture of electrical machinery, equipment and supplies, manufacture of information and communication electronics equipment, manufacture of transportation equipment as sub-category manufacture of manufacture of motor vehicles, parts and accessories and manufacture of miscellaneous transportation equipment), and 16 types of industry of the miscellaneous manufacturing industries.

* Inventory-sales ratio = inventory assets (end of the current period) / sales amount (end of the current period)) = (raw materials and supplies (current assets at end of the current period)) plus Goods in process (current assets at end of the current period) plus Product or merchandise (current assets at end of the current period)) / Sales amount (end of the current period)

* Raw materials, goods in process inventory-sales ratio = (raw materials and supplies (current assets at end of the current period)) plus Goods in process (current assets at end of the current period))÷Sales amount (end of the current period)

* Product inventory-sales ratio = (product or merchandise (current assets at end of the current period)) / sales amount (end of the current period)

[13] About the inventory-sales ratio according to the item, we estimated the level in most recent years (2009 and 2010) using Ministry of Economy, Trade and Industry "dynamic statistics of production". (As for the method of estimate, we referred to Ministry of Economy, Trade and Industry (2005) "trend of the inventory-sales ratio" industrial activity analysis (July-September, 2005). As for the transportation machine products, Product inventory-sales ratio of the automobile parts (car air-conditioner only) is the lowest level of approximately 0.1 months, and also in the completed passenger car it was in low level of approximately 0.2 months. In contrast, the stock of product of electronic parts/device (semiconductor elements such as liquid crystalline element and integrated circuit and diode) was in slightly high level of approximately 0.4-1 months. And although as for the finished product of the consumer electronic machine, liquid crystal television was low (approximately 0.2-0.3 months), the automotive products such as car navigation system and car audio system it was slightly high.
In addition, as for the metalworking machine categorized in general machine it was further high with approximately 1-1.8 months.

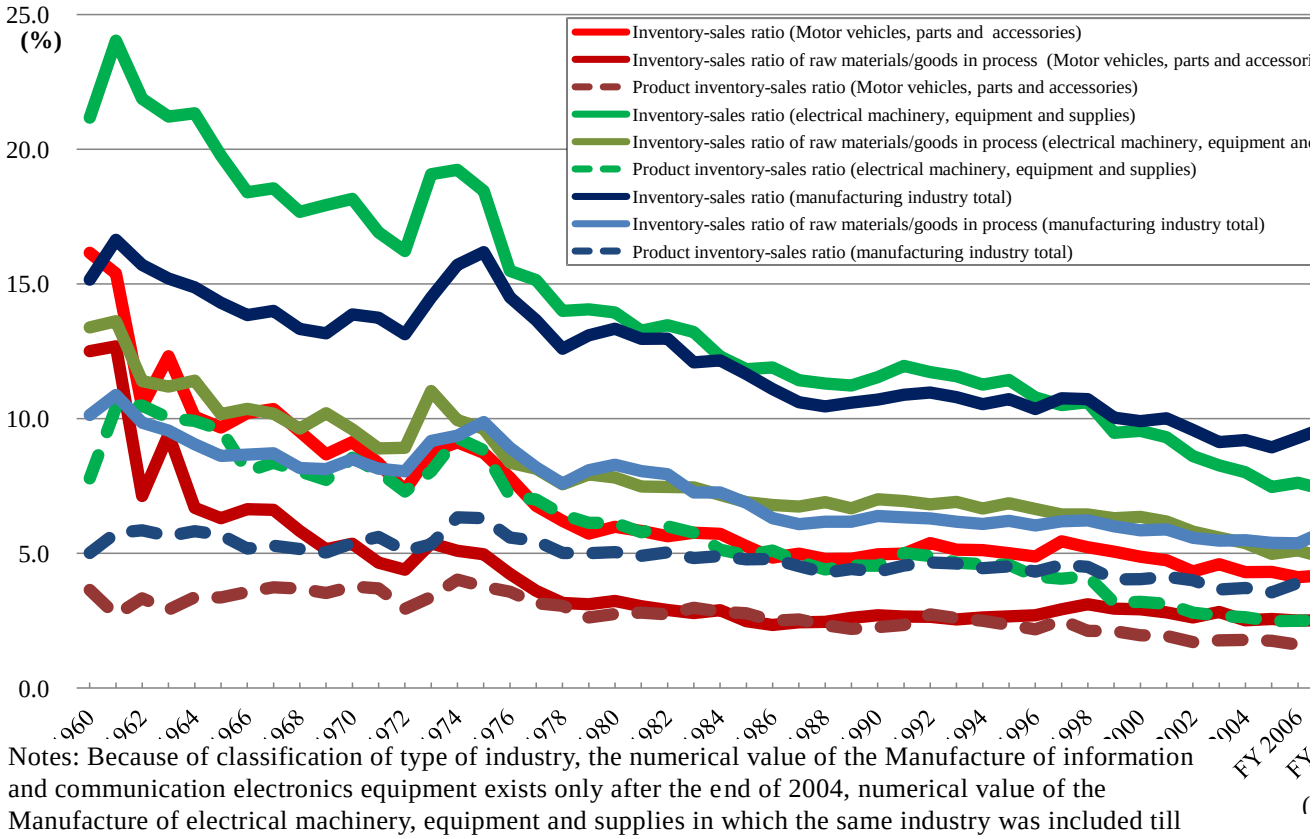
the inventory control of each type of industry and the supply chain management (hereafter SCM).

Table 4-2-1-12 Comparison of inventory-sales ratio (at each production process) of Japanese main manufacturing industry (as at end of FY2009)

Item	Inventory-sales ratio	Inventory-sales ratio	Inventory-sales ratio
(calculating formula)	Stock (inventory assets)/sales amount	Stock of raw materials/goods in process/sales amount	Stock of product sales amount
(relation)	(1) + (2)	(1)	(2)
(unit)	%	%	%
Motor vehicles, parts and accessories	4.6	3.0	1.7
Manufacture of transportation equipment	6.0	4.3	1.7
Manufacture of information and communication electronics equipment	7.5	5.1	2.4
Manufacture of pulp, paper and paper products	7.7	3.9	3.7
Manufacture of electrical machinery, equipment and supplies	8.9	6.2	2.8
Miscellaneous manufacturing industries	10.2	5.0	5.2
Manufacture of fabricated metal products	10.3	6.6	3.7
Manufacture of industrial equipment	11.2	6.8	4.4
Manufacture of petroleum and coal products	11.2	7.9	3.3
Manufacture of ceramic, stone and clay products	11.7	5.7	6.0
Manufacture of chemical	12.9	5.6	7.3
Manufacture of general machinery	14.4	11.3	3.1
Manufacture of non-ferrous metals and products	15.3	10.9	4.3
Miscellaneous transportation equipment	16.2	14.9	1.3
Manufacture of iron and steel	18.7	12.4	6.3
Manufacture of production equipment,	20.1	14.4	5.7
Manufacturing industries total	10.3	6.2	4.1

Notes: Because of rounding off, sum of Inventory-sales ratio of raw materials/goods in process by various business category, and Product inventory-sales ratio may not become the value of the inventory-sales ratio.
Motor vehicles, parts and accessories and Miscellaneous transportation equipment (Manufacturing industries of railroad, vessel, aircraft, industrial use transportation vehicles etc.) are a breakdown of the Manufacture of transportation equipment.
Source: "Financial Statements Statistics of Corporations by Industry" (annual survey (FY2009)) (Ministry of Finance)

Figure 4-2-1-13 Comparison of inventory-sales ratio of car industry and electrical machinery industry of Japan (after the end of 1960: in chronological order)



Notes: Because of classification of type of industry, the numerical value of the Manufacture of information and communication electronics equipment exists only after the end of 2004, numerical value of the Manufacture of electrical machinery, equipment and supplies in which the same industry was included till then is used. There are almost no change in inventory-sales ratio level of both types of industries.
Source: "Financial Statements Statistics of Corporations by Industry" (annual survey (data of each fiscal year)) (Ministry of Finance)

As for the car industry, inventory-sales ratio has been low since the past, it is noted that it has kept the low as of current level at around 5% since the late 1980s. And, whereas stock of product particularly has been always in low level after the 1960s with almost no change, inventory of raw materials and goods in process continues declining until it becomes to the level of stock of product by the late 1970s, then the level becomes higher than that of stock of product again after the late 1990s. This stock trend of the car industry is considered to have close relationship with production system and SCM, the level of the stock of product has been held low constantly for the build-to-order manufacturing system in the past, In contrast, the stock of raw materials/goods in process has had a change every year though it is in low level. From inventory-sales ratio of raw materials/goods in process we can clearly find the change of the car industry that has been trying to find out domestic and foreign consumers' preference flexibly, in order to realize shortening of working hour in the field of production system while minimizing stock between processes in the light of inventory control, and to capture the final demand properly,

We have experienced many changes in management techniques such as the era of large-lot production of a narrow product range of until early 1970s, the era of limited production of a wide variety of products from late 1970s through early 1990s, the era of variable order of different types and quantities of products with matching production when predicting the demand was very difficult

after late 1990s. The change of the management techniques and trend of change of the raw materials/goods in process inventory-sales ratio are interacted each other and the industries have been always conscious the SCM seriously. In other words, it is considered that the car industry have appropriately managed and controlled the complicatedly build global supply-chain under the effective inventory control as a technique.

From the rough comparison of SCM between electric machine industry and the car industry (Table 4-2-1-14), we can understand the contrast between the above-mentioned car industry's method of constructing SCM and the method of electric machine industry. The electric machine industry intends reduction of production cost in performing lot production with reduced arrangement change, and by conducting make-to-stock production while approving the stock between processes as buffering, adopt the technique to build SCM having some amount of stock of product.

However, SCM of both industries adopts the effective technique most suitable for their type of industry. For example, when comparing "the ratio of inventory-sales ratio and sales administrative expense" with inventory-sales ratio (Figure 4-2-1-15), we can understand that both industries have maintained a reasonable level with some difference in each industry. In order to further strengthen SCM which is established minutely in accordance with each industry, efforts to strengthen the objective risk management are now under way in various fields, in addition to the effective mechanism in the past and business relationship between the concerned parties based on trust and reliance which is an advantage of Japanese industry[14].

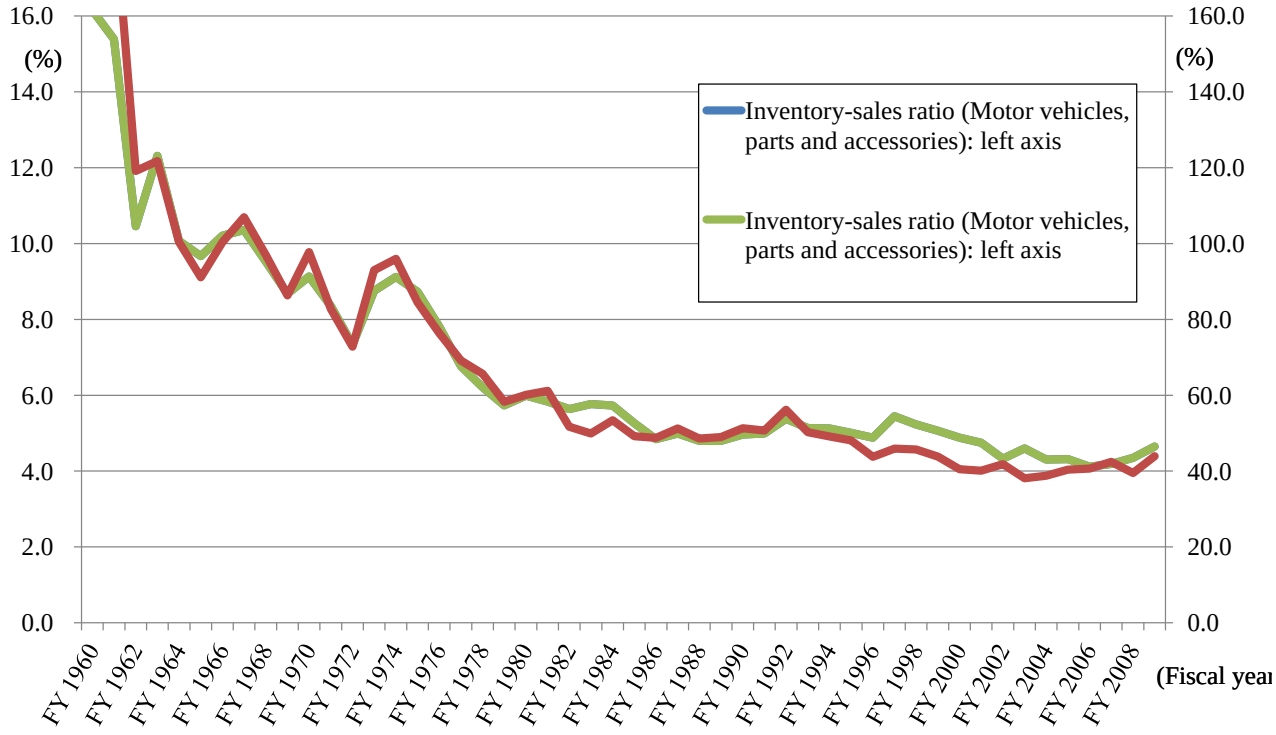
Table 4-2-1-14 Comparison of SCM between car industry and electrical machinery industry of Japan

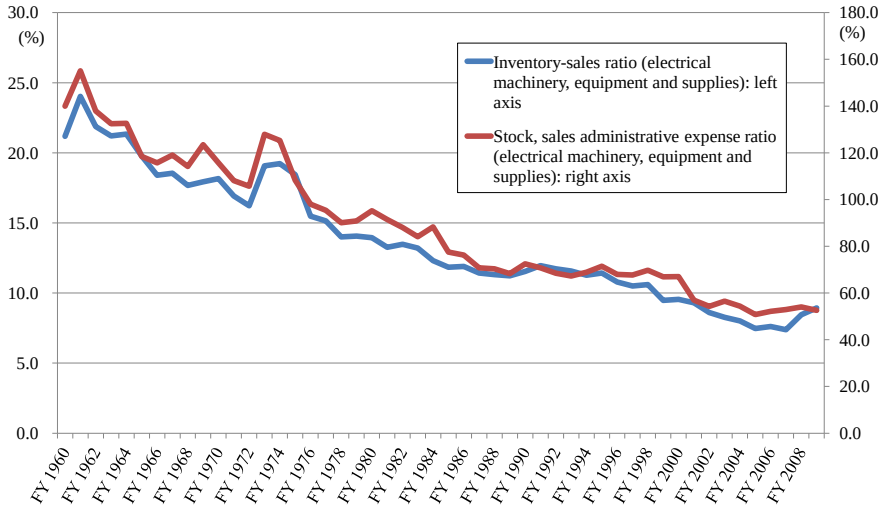
	Production system	Production method	Stock between processes	Stock of product	Stock of product
Car industry	Multiple type variable quantity production (one by one production)	Build-to-order manufacturing	Minimum	Minimum	Shortening of the arrangements time (single arrangements)
Electrical machinery industry	Lot production	Make-to-stock production	Stock (Buffer stock)	Stock	focus on reduction of frequency

Source: "Investigation and study report on development directivity of the accumulation and possibility of location in Tohoku region of Automobile related industry (2009)" (March, 2010) (Japan Machinery Federation and Japan Industrial Location Center)

[14] About the advantage of the cooperation system based on the relationship of mutual trust between Japanese companies (particularly, in the car industry) at the time of the disaster, it is pointed out in Yossi Sheffi's <Watanabe, K, K. Yoshihiro supervising and translation>(2007) "Company Resilience and the business continuation management" Nikkan Kogyo Shimbun, Ltd, and in Fumiko Kurokawa's (2008) "Car industry strategy in the 21st century" Zeimu Keiri Kyokai.
On the other hand, there is an argument that promotion of the natural disaster risk management is not necessarily complimentary with the supplier system which has functioned stably and effectively till now (Tanaka, K, T. Uenoyama (2008)) as has been shown in "Natural disaster risk management and supply chain" (ESRI Discussion Paper Series No. 200) Cabinet Office Economic and Social Research Institute.

Figure 4-2-1-15 Relationship of stock and sales administrative expense in Japanese car industry and electrical machinery industry (after the end of 1960: in chronological order)





Notes: Inventory-sales ratio = inventory assets (end of the current period)/ sales amount (end of the current period)); Stock, sales administrative expense ratio = inventory assets (end of the current period)/ sales cost and administrative expense (end of the current period))
Source: "Financial Statements Statistics of Corporations by Industry" (annual survey (data of each fiscal year)) (Ministry of Finance)

2. Significance of the disaster-stricken area with the global supply-chain which became clear through the earthquake disaster

(1) Rough positioning of "Tohoku area"[15] in the industrial linkage between areas

As we inspected in Section 1, since direct export from disaster-stricken area is not so large compared with Japan's entire export, indirect export from disaster-stricken area (hereafter "indirect export") must be taken to consideration. "Indirect export" defined here referred to the situation where "the production activity (products etc.) in one area is intermediately input into the production activity(products etc.) in the other area, and the products produced in other areas as a result of the input are exported abroad". We will explain the importance of taking the indirect export into consideration.

Particularly, stagnation of the production activity in the disaster-stricken area just after this earthquake disaster has affected not only on inside of Japan but also on the supply chain of overseas production base. Therefore, in the case exported products are commodities to be input intermediately to production activity in foreign countries such as parts, we analyzed them with precedence, since they are considered to have greater influence on global supply-chain.

At first to grasp influence of "the indirect export", we inspected what kind of intermediate commodity Tohoku region of the disaster-stricken area input to the other areas. We extracted the intermediate demand sections (endogenous sector) in each local area which have much amount of intermediate input from the Tohoku area, using the 12- sections table in "HEISEI 17-NEN (2005) CHIIKIKAN SANGYO KANRENHYO Inter-regional I/O table" (hereafter CHIIKIKANHYO inter-regional table) which was released in March, 2010 (Table 4-2-2-1).

The total sum of intermediate input from the Tohoku area including that of the region one belongs to is approximately 25 trillion yen. As for the intermediate demand section receiving a lot of intermediate input other than that of the region one belongs to, the top is the machinery division of Kanto area, with approximately 1,690 billion yen (6.8% of the total), followed by the service sector of Kanto area, with approximately 1,110 billion yen (4.4%). Other various sections in Kanto area also receive a lot of intermediate input following the above two sections, Sector in the other area than Kanto area is the machinery division of the Chubu area (approximately 400 billion yen, 1.6%) which is significantly ranked low. Based on this data, intermediate sections which receive the largest portion of products of Tohoku area as intermediate input is the manufacturing industries in Kanto area particularly machine industry.

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[15] In the case of this earthquake disaster in the Kanto area including the Ibaraki prefecture except the Tohoku area, the significant damage was caused by the earthquake or the tsunami which occurred immediately after that. The Kanto region in the Inter-Regional I/O Tables (CHIIKIKANHYO) is classified into the broad-based Kanto region (Ibaraki prefecture, Tochigi, Gunma, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Yamanashi, Nagano, Shizuoka). On that reason, instead of identifying strict disaster-stricken area, we have made our consideration on influence of "the indirect export" from disaster-stricken area by analyzing influence of the "indirect export from the data of Tohoku area in the Inter-Regional I/O Tables (CHIIKIKANHYO) (Aomori, Iwate, Miyagi, Akita, Yamagata, Fukushima).

Table 4-2-2-1 Intermediate demand (endogenous) sector in various domestic regions which have large amount of intermediate input from Tohoku region

Ranking	Region	Sector	Amount (hundred million yen)	Percentage (%)
	Whole country	Endogenous sector total	249,803	100.0%
(Reference)	(Tohoku)	(Export)	33,245	
1	Tohoku	Service	37,195	14.9%
2	Tohoku	Machinery	26,284	10.5%
3	Tohoku	Other manufacturing industries	17,786	7.1%
4	Tohoku	Commerce, transportation	17,571	7.0%
5	Kanto	Machinery	16,907	6.8%
6	Tohoku	Construction	14,819	5.9%
7	Tohoku	Food and beverage	11,797	4.7%
8	Kanto	Service	11,104	4.4%
9	Tohoku	Public utilities	10,931	4.4%
10	Tohoku	Finance, insurance, real estate	9,749	3.9%
11	Tohoku	Metal	6,930	2.8%
12	Tohoku	Agriculture, forestry and fisheries	6,842	2.7%
13	Kanto	Other manufacturing industries	6,231	2.5%
14	Kanto	Food and beverage	5,053	2.0%
15	Kanto	Construction	5,029	2.0%
16	Chubu	Machinery	3,958	1.6%
17	Tohoku	Information and communication	3,785	1.5%
18	Kanto	Commerce, transportation	3,530	1.4%
19	Kanto	Metal	2,737	1.1%
20	Kinki	Service	2,151	0.9%
21	Kanto	Information and communication	1,962	0.8%
22	Kinki	Machinery	1,897	0.8%
23	Chubu	Service	1,610	0.6%
24	Kinki	Food and beverage	1,588	0.6%
25	Kinki	Other manufacturing industries	1,428	0.6%
26	Kyushu	Machinery	1,311	0.5%
27	Chubu	Other manufacturing industries	1,262	0.5%
28	Kanto	Public utilities	1,090	0.4%
29	Kyushu	Service	1,060	0.4%
30	Hokkaido	Service	1,022	0.4%

Notes:
1. The intermediate demand of various domestic regions (each endogenous sector) is extracted, where there is the intermediate input amount more than 100 billion yen from endogenous sector total of the Tohoku region.
2. The green shaded area is intermediate demand section of the Kanto region. The orange shaded area is intermediate demand sector of other regions.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO (12 sections transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

(2) Intermediate input from the Tohoku area to the parts industry in other areas

For further understanding, we inspected the details of individual sectors in which the amount of the intermediate input from Tohoku area is large, and that of machine industry in Kanto area, using Transaction amount table of the 53-sector table which is the most detailed in Inter-Regional I/O Tables (CHIIKIKANHYO) (Table 4-2-2-2). Among the intermediate input to the machinery division of Kanto area, the sector with largest amount of input is automobile parts, accessories (hereafter automobile parts) sector, with approximately 370 billion yen, accounting for approximately 22% of whole machinery division. Second largest is general machinery divisions (approximately 260 billion yen, 15.4% of the total), followed by electronic parts sector (approximately 220 billion yen, 13.3%), and passenger car sector (approximately 160 billion yen, 9.2%). From this result, we can understand that proportion of input to parts industry in Kanto area are large in the intermediate input from the Tohoku area. Therefore, it is necessary to conduct detailed study about the automobile parts and electronic parts that is considered to have greater influence on global supply-chain, in addition to the direct export of goods produced in Tohoku area.

Table 4-2-2-2 Details of machinery sector in Kanto region which have large amount of intermediate input from Tohoku region

Ranking	Region	Sector	Amount (hundred million yen)	Percentage (%)
	Kanto	Machinery total	16,907	100.0%
1	Kanto	Automobile parts, accessories	3,709	21.9%
2	Kanto	General machinery	2,597	15.4%
3	Kanto	Electronic parts	2,247	13.3%
4	Kanto	Passenger car	1,562	9.2%
5	Kanto	Communications machinery, related machinery	1,380	8.2%
6	Kanto	Other electrical machinery	1,062	6.3%
7	Kanto	Other automobiles	1,000	5.9%
8	Kanto	Industrial use electric appliance	738	4.4%
9	Kanto	Equipment for office works and service	716	4.2%
10	Kanto	Computer, attachment	693	4.1%
11	Kanto	Precision machinery	625	3.7%
12	Kanto	Other transportation machinery	325	1.9%
13	Kanto	Consumer electric appliance	253	1.5%

Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO (12 sections transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

(A) Status of intermediate input into automotive parts industry in Kanto region

Furthermore, in order to understand from which area/sector the intermediate input is made to automobile parts sector of Kanto region, we extracted intermediate input sector with much input amount in each region of Japan (Table 4-2-2-3). In total input of approximately 8,800 billion yen from endogenous sector, and input from automobile parts sector in the region one belongs accounts

for approximately 39% (approximately 3,420 billion yen) of the total input. In the second place, the intermediate input from the sector of the Chubu region is large (approximately 710 billion yen, 8.1% of the total). The amount of intermediate input from the same sector in Tohoku region is approximately 200 billion yen (2.3%), and it is about one seventeenth of the input from the region one belongs, and in the input scale, approximately two seventh of input comes from Chubu region. In addition, "the regional production" of the automobile parts of the Kanto region in the Inter-Regional I/O Tables (CHIIKIKANHYO) is approximately 11 trillion yen, which account for 38.5% next to the Chubu region for a domestic production value share.

Table 4-2-2-3 The intermediate input sector of various domestic regions which have large amount of intermediate input to automobile parts in Kanto region

Ranking	Region	Sector	Amount (hundred million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	8,751,232	100.0%
1	Kanto	Automobile parts, accessories	3,420,007	39.1%
2	Chubu	Automobile parts, accessories	711,535	8.1%
3	Kanto	Commerce	574,118	6.6%
4	Kanto	Steel	440,793	5.0%
5	Kanto	Education, research	327,527	3.7%
6	Kanto	Nonferrous metal	245,475	2.8%
7	Tohoku	Automobile parts, accessories	198,612	2.3%
8	Kanto	Other service for office	186,196	2.1%
9	Kanto	Plastic products	185,719	2.1%
10	Kanto	Industrial use electric appliance	117,056	1.3%
11	Kinki	Automobile parts, accessories	107,937	1.2%
12	Kanto	Transportation	105,819	1.2%
13	Kanto	Other manufacturing industry products	97,983	1.1%
14	Kanto	Chemical end product	86,436	1.0%
15	Kanto	Metal product	86,001	1.0%
16	Kinki	Steel	82,439	0.9%
17	Chugoku	Automobile parts, accessories	79,664	0.9%
18	Kanto	Electronic parts	78,560	0.9%
19	Kanto	Electricity	76,762	0.9%
20	Kanto	Finance, insurance	65,929	0.8%

Notes:
1. Top 20 intermediate input sector of various domestic regions which have large amount of intermediate input to automobile parts in Kanto region are extracted
2. The green shaded area is automobile parts, accessories sector of Tohoku region. The yellow shaded area is automobile parts, accessories sector of other regions. The orange shaded area is electricity, transportation sector of Kanto region.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO (53 section transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

From the result of the above, we can understand that the percentage of intermediate input from the automobile parts sector of the Tohoku region in the same sector in Kanto region is relatively few. Therefore, although in short-term we cannot deny that impact of the damage of the office in Tohoku region is more likely to involve the automobile parts sector in Kanto region, in a little bit

longer period, say, several years, there is the possibility that the impact is much limited. In addition, there is relatively much intermediate input from infrastructure sector, for example, transportation sector (approximately 106 billion yen, 1.2% of the total) and electricity sector (approximately 77 billion yen, 0.9% of the total) in Kanto region. Therefore, it is necessary to consider the impact of these sectors.

(B) Status of intermediate input into electronic parts industry in Kanto region

Furthermore, we collect the data about from which region/sector intermediate input was made to electronic parts sector in Kanto region as in the automobile parts (Table 4-2-2-4). In total inputs approximately 3,900 billion yen from endogenous sector, the Input from the electronic parts sector of the own region is the largest and accounts for approximately 23% (approximately 920 billion yen). This is the same input structure as in automobile parts in Kanto region. Next to the above, intermediate input from the electronic parts sector of other regions such as Chubu region and Kinki region amount much (approximately 200 billion yen, and approximately 190 billion yen respectively, around 5% of the total), and the intermediate input from the same sector in Tohoku region is little bit smaller, approximately 150 billion yen (3.7%), which is approximately one-sixth in input scale from Kanto region.

In addition, in the Inter-Regional I/O Tables (CHIIKIKANHYO) "regional production" of electronic parts in Kanto region is approximately 5,350 billion yen, account for 33%, the largest percentage in domestic production value share.

From the above result, we can understand that the percentage of intermediate input from Tohoku region in electronic parts sector in Kanto region is slightly more than percentage of input of automobile parts , but it is low as for percentage in the total as was expected, indicating that there is much input from the own region. Therefore, in short-term, in a similar way as in the case of automobile parts sector in Kanto region, we cannot deny the possibility that the damage of the office of the Tohoku region would affect the electronic parts sector In Kanto region, but in a little bit longer period, there is the possibility that the impact is relatively slight. In addition, the intermediate input from infrastructure sector such as electricity sector (approximately 76 billion yen, 1.9% of the whole) and transportation sector (approximately 64 billion yen, 1.6%) in Kanto region is much more in comparison with the percentage of input into the automobile sector in Kanto region. Therefore, it is necessary to carefully consider those impacts.

Table 4-2-2-4 The intermediate input sector of various domestic regions which have large amount of intermediate input to electronic parts sector in Kanto region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	3,930,253	100.0%
1	Kanto	Electronic parts	921,736	23.5%
2	Kanto	Education, research	446,669	11.4%
3	Chubu	Electronic parts	196,389	5.0%
4	Kinki	Electronic parts	189,073	4.8%
5	Kanto	Commerce	168,043	4.3%
6	Kanto	Other service for office	162,201	4.1%
7	Tohoku	Electronic parts	145,982	3.7%
8	Chugoku	Electronic parts	120,954	3.1%
9	Kanto	Nonferrous metal	119,091	3.0%
10	Kanto	Plastic products	78,350	2.0%
11	Kanto	Electricity	76,358	1.9%
12	Kyushu	Electronic parts	69,929	1.8%
13	Kanto	Metal product	68,034	1.7%
14	Kanto	Transportation	64,096	1.6%
15	Kanto	Commodity lease service	62,569	1.6%
16	Kanto	Other electrical machinery	59,812	1.5%
17	Kanto	Ceramics, stone and clay products	59,564	1.5%
18	Kanto	Finance, insurance	56,688	1.4%
19	Chubu	Ceramics, stone and clay products	43,794	1.1%
20	Kanto	Construction	38,100	1.0%

Notes:
1. Top 20 intermediate input sector of various domestic regions which have large amount of intermediate input to electronic parts sector in Kanto region are extracted
2. The green shaded area is electronic parts sector of Tohoku region. The yellow shaded area is electronic parts sector of other regions. The orange shaded area is electricity, transportation sector of Kanto region.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

(C) Status of intermediate input into automobile parts, and electronic parts industries in other regions

Furthermore, we have captured the situation of intermediate input from Tohoku region to the automobile parts and electronic parts sectors in the regions other than Kanto region similarly to the above, and at the same time, we conducted a structural comparison of the parts industries in various regions (Tables 4-2-2-5 and e 4-2-2-6).

As a result, it is indicated that there is no region that has more amount of input from the automobile parts and electronic parts sectors in Tohoku than Kanto region. In the input to Tohoku region, although in the electronic parts sector, the amount of input to the relevant sector in the region one belongs exceeds input to Kanto region (amount of input to Kanto region is approximately 150 billion yen, while the amount of input to the region one belongs is approximately 360 billion yen), in the automobile parts sector it is far below the amount of input to Kanto region (amount of input to Kanto region is approximately 200 billion yen while the amount of input to the region is approximately 80 billion yen).

This analysis proves that in a comparison between automotive parts industry and the electronic parts industry, there is a different structure in uneven regional distribution of intermediate input or input percentage even in the parts industry.

The automobile parts sector is divided definitely into regions in which percentage of input from the same sector of the region one belongs is as much as 30-40 % (Chubu, Kanto, and Chugoku), greater than the regions with small percentage of input (the other regions). The region with high percentage of input from a particular region is the major automobile production region. The other regions receive particularly high percentage input from Chubu region. But on the contrary, as for the electronic parts sector, input percentage from the same sector is not so diverse in all regions. Input from the same sector to the region accounts for the largest percentage, except Hokkaido. However, the region with higher percentage of regional input rate lies in the automobile parts sector if the input rate is before and after 20% is lower than what is as above 30%. It is understood that, though relatively, the division of labor within domestic areas of the region is done evenly in average.

Table 4-2-2-5 The intermediate input sector of various regions which have large amount of intermediate input to automobile parts in various domestic regions

○Intermediate input to the automobile parts sector in Chubu region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	9,426,149	100.0%
1	Chubu	Automobile parts, accessories	3,981,873	42.2%
2	Kanto	Automobile parts, accessories	606,506	6.4%
3	Chubu	Steel	360,926	3.8%
4	Chubu	Education, research	321,276	3.4%
5	Kanto	Commerce	280,048	3.0%
6	Chubu	Nonferrous metal	270,651	2.9%
7	Chubu	Plastic products	268,747	2.9%
8	Kinki	Automobile parts, accessories	239,073	2.5%
9	Chubu	Commerce	217,449	2.3%
10	Chubu	Industrial use electric appliance	196,241	2.1%
11	Chubu	Other service for office	156,150	1.7%
12	Kinki	Commerce	133,320	1.4%
13	Chubu	Electronic parts	114,677	1.2%
14	Chubu	Electricity	104,178	1.1%
15	Kinki	Steel	93,740	1.0%
16	Chubu	Transportation	81,934	0.9%
17	Hokkaido	Automobile parts, accessories	74,264	0.8%
18	Kyushu	Automobile parts, accessories	71,614	0.8%
19	Chubu	Other manufacturing industry products	69,006	0.7%
20	Kanto	Steel	67,593	0.7%
28	Chugoku	Automobile parts, accessories	53,319	0.6%
44	Tohoku	Automobile parts, accessories	22,154	0.2%

○Intermediate input to automobile parts sector in Kanto region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	8,751,232	100.0%
1	Kanto	Automobile parts, accessories	3,420,007	39.1%
2	Chubu	Automobile parts, accessories	711,535	8.1%
3	Kanto	Commerce	574,118	6.6%
4	Kanto	Steel	440,793	5.0%
5	Kanto	Education, research	327,527	3.7%
6	Kanto	Nonferrous metal	245,475	2.8%
7	Tohoku	Automobile parts, accessories	198,612	2.3%
8	Kanto	Other service for office	186,196	2.1%
9	Kanto	Plastic products	185,719	2.1%
10	Kanto	Industrial use electric appliance	117,056	1.3%
11	Kinki	Automobile parts, accessories	107,937	1.2%
12	Kanto	Transportation	105,819	1.2%
13	Kanto	Other manufacturing industry products	97,983	1.1%
14	Kanto	Chemical end product	86,436	1.0%
15	Kanto	Metal product	86,001	1.0%
16	Kinki	Steel	82,439	0.9%
17	Chugoku	Automobile parts, accessories	79,664	0.9%
18	Kanto	Electronic parts	78,560	0.9%
19	Kanto	Electricity	76,762	0.9%
20	Kanto	Finance, insurance	65,929	0.8%

○Intermediate input to automobile parts sector in Chugoku region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	1,720,558	100.0%
1	Chugoku	Automobile parts, accessories	518,422	30.1%
2	Chubu	Automobile parts, accessories	202,217	11.8%
3	Chugoku	Steel	97,583	5.7%
4	Kanto	Automobile parts, accessories	77,321	4.5%
5	Kinki	Automobile parts, accessories	69,373	4.0%
6	Chugoku	Education, research	67,486	3.9%
7	Kanto	Commerce	47,481	2.8%
8	Kinki	Commerce	36,044	2.1%
9	Chugoku	Plastic products	35,169	2.0%
10	Chugoku	Commerce	28,055	1.6%
11	Chugoku	Nonferrous metal	22,725	1.3%
12	Kinki	Steel	22,497	1.3%
13	Chugoku	Other service for office	21,848	1.3%
14	Chugoku	Transportation	20,651	1.2%
15	Kyushu	Automobile parts, accessories	20,438	1.2%
16	Chubu	Commerce	18,590	1.1%
17	Chugoku	Electricity	18,405	1.1%
18	Kinki	Industrial use electric appliance	17,098	1.0%
19	Kanto	Steel	14,892	0.9%
20	Chugoku	Electronic parts	14,733	0.9%
64	Tohoku	Automobile parts, accessories	2,550	0.1%

○Intermediate input to the automobile parts sector in Kinki region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	1,251,090	100.0%
1	Chubu	Automobile parts, accessories	295,106	23.6%
2	Kinki	Automobile parts, accessories	173,054	13.8%
3	Kanto	Automobile parts, accessories	101,534	8.1%
4	Kinki	Commerce	56,993	4.6%
5	Chugoku	Automobile parts, accessories	53,302	4.3%
6	Kinki	Steel	52,690	4.2%
7	Kinki	Education, research	39,381	3.1%
8	Kinki	Industrial use electric appliance	27,133	2.2%
9	Kanto	Commerce	25,067	2.0%
10	Kinki	Other service for office	24,658	2.0%
11	Kinki	Nonferrous metal	24,254	1.9%
12	Chubu	Nonferrous metal	17,135	1.4%
13	Chubu	Steel	16,035	1.3%
14	Kinki	Plastic products	14,879	1.2%
15	Kinki	Electricity	14,761	1.2%
16	Kinki	Transportation	13,381	1.1%
17	Kanto	Education, research	13,002	1.0%
18	Kinki	Metal product	12,369	1.0%
19	Chugoku	Steel	12,118	1.0%
20	Kinki	Electronic parts	11,011	0.9%
23	Tohoku	Automobile parts, accessories	10,060	0.8%

○Intermediate input to the automobile parts sector in Kyushu region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	831,515	100.0%
1	Chubu	Automobile parts, accessories	141,765	17.0%
2	Kanto	Automobile parts, accessories	123,068	14.8%
3	Kyushu	Automobile parts, accessories	121,592	14.6%
4	Kyushu	Steel	34,241	4.1%
5	Chugoku	Automobile parts, accessories	28,276	3.4%
6	Kyushu	Commerce	27,975	3.4%
7	Kyushu	Education, research	24,695	3.0%
8	Kyushu	Other service for office	18,809	2.3%
9	Kyushu	Plastic products	15,939	1.9%
10	Kinki	Automobile parts, accessories	13,388	1.6%
11	Kyushu	Nonferrous metal	13,106	1.6%
12	Kanto	Commerce	12,584	1.5%
13	Kyushu	Electronic parts	12,545	1.5%
14	Kanto	Education, research	11,307	1.4%
15	Kyushu	Transportation	10,936	1.3%
16	Kinki	Steel	9,899	1.2%
17	Tohoku	Automobile parts, accessories	8,860	1.1%
18	Kinki	Commerce	8,304	1.0%
19	Kyushu	Electricity	8,042	1.0%
20	Kanto	Steel	7,147	0.9%

○Intermediate input to automobile parts sector in Tohoku region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	563,262	100.0%
1	Chubu	Automobile parts, accessories	119,919	21.3%
2	Tohoku	Automobile parts, accessories	80,253	14.2%
3	Kanto	Automobile parts, accessories	53,794	9.6%
4	Kanto	Commerce	27,186	4.8%
5	Tohoku	Education, research	19,680	3.5%
6	Tohoku	Nonferrous metal	17,352	3.1%
7	Chugoku	Automobile parts, accessories	13,637	2.4%
8	Tohoku	Steel	13,605	2.4%
9	Tohoku	Commerce	11,698	2.1%
10	Tohoku	Electricity	10,855	1.9%
11	Tohoku	Plastic products	10,850	1.9%
12	Kanto	Steel	10,491	1.9%
13	Kanto	Industrial use electric appliance	8,869	1.6%
14	Kanto	Education, research	8,590	1.5%
15	Tohoku	Other service for office	8,445	1.5%
16	Kanto	Nonferrous metal	7,702	1.4%
17	Kanto	Plastic products	7,669	1.4%
18	Chubu	Industrial use electric appliance	6,984	1.2%
19	Tohoku	Transportation	6,600	1.2%
20	Kinki	Commerce	5,008	0.9%
21	Tohoku	Electronic parts	4,803	0.9%

○Intermediate input to the automobile parts sector in Hokkaido region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	140,880	100.0%
1	Chubu	Automobile parts, accessories	34,490	24.5%
2	Chugoku	Automobile parts, accessories	12,239	8.7%
3	Hokkaido	Commerce	7,899	5.6%
4	Hokkaido	Steel	6,907	4.9%
5	Kanto	Education, research	6,490	4.6%
6	Hokkaido	Other service for office	5,994	4.3%
7	Kanto	Steel	4,413	3.1%
8	Kanto	Automobile parts, accessories	3,944	2.8%
9	Hokkaido	Automobile parts, accessories	3,624	2.6%
10	Hokkaido	Electricity	3,550	2.5%
11	Hokkaido	Education, research	3,330	2.4%
12	Hokkaido	Nonferrous metal	2,908	2.1%
13	Kanto	Commerce	2,515	1.8%
14	Kanto	Metal product	2,219	1.6%
15	Hokkaido	Transportation	2,059	1.5%
16	Kinki	Steel	1,692	1.2%
17	Chubu	Steel	1,572	1.1%
18	Hokkaido	Finance, insurance	1,360	1.0%
19	Hokkaido	Metal product	1,346	1.0%
20	Kanto	Nonferrous metal	1,109	0.8%
65	Kinki	Automobile parts, accessories	238	0.2%
113	Tohoku	Automobile parts, accessories	53	0.04%

○Intermediate input to the automobile parts sector in Shikoku region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	10,204	100.0%
1	Chubu	Automobile parts, accessories	2,988	29.3%
2	Chugoku	Automobile parts, accessories	966	9.5%
3	Kanto	Automobile parts, accessories	739	7.2%
4	Shikoku	Education, research	444	4.4%
5	Shikoku	Steel	380	3.7%
6	Kanto	Commerce	302	3.0%
7	Shikoku	Automobile parts, accessories	258	2.5%
8	Shikoku	Other service for office	237	2.3%
9	Kinki	Commerce	224	2.2%
10	Shikoku	Electricity	188	1.8%
11	Kinki	Steel	183	1.8%
12	Shikoku	Transportation	167	1.6%
13	Chubu	Steel	146	1.4%
14	Chugoku	Steel	139	1.4%
15	Chubu	Plastic products	138	1.4%
16	Shikoku	Commerce	119	1.2%
17	Shikoku	Finance, insurance	114	1.1%
18	Kanto	Education, research	101	1.0%
19	Chubu	Commerce	100	1.0%
20	Kanto	Plastic products	90	0.9%
39	Kinki	Automobile parts, accessories	35	0.3%
83	Tohoku	Automobile parts, accessories	11	0.1%

(Reference) Regional production amount of automobile parts

Region	Amount (million yen)	Percentage (%)
Whole regions	28,648,620	100.0%
Chubu	11,907,913	41.6%
Kanto	11,040,432	38.5%
Chugoku	2,176,785	7.6%
Kinki	1,568,162	5.5%
Kyushu	1,039,575	3.6%
Tohoku	717,719	2.5%
Hokkaido	183,820	0.6%
Shikoku	14,195	0.0%
Okinawa	19	0.0%

Notes:
1. Top 20 intermediate input sectors of various domestic regions which have large amount of intermediate input to automobile parts sector in each region are extracted
2. The green shaded area is automobile parts sector of Tohoku region. The light blue shaded area is automobile parts sector of the region to which it belongs. The yellow shaded area is automobile parts sector of other regions. The orange shaded area is electricity, transportation sector of the region to which it belongs.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO (Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

Table 4-2-2-6 The intermediate input sector of various regions which have large amount of intermediate input to electronic parts sector in various domestic regions

○Intermediate input to electronic parts sector In Kanto region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	3,930,253	100.0%
1	Kanto	Electronic parts	921,736	23.5%
2	Kanto	Education, research	446,669	11.4%
3	Chubu	Electronic parts	196,389	5.0%
4	Kinki	Electronic parts	189,073	4.8%
5	Kanto	Commerce	168,043	4.3%
6	Kanto	Other service for office	162,201	4.1%
7	Tohoku	Electronic parts	145,982	3.7%
8	Chugoku	Electronic parts	120,954	3.1%
9	Kanto	Nonferrous metal	119,091	3.0%
10	Kanto	Plastic products	78,350	2.0%
11	Kanto	Electricity	76,358	1.9%
12	Kyushu	Electronic parts	69,929	1.8%
13	Kanto	Metal product	68,034	1.7%
14	Kanto	Transportation	64,096	1.6%
15	Kanto	Commodity lease service	62,569	1.6%
16	Kanto	Other electrical machinery	59,812	1.5%
17	Kanto	Ceramics, stone and clay products	59,564	1.5%
18	Kanto	Finance, insurance	56,688	1.4%
19	Chubu	Ceramics, stone and clay products	43,794	1.1%
20	Kanto	Construction	38,100	1.0%

○Intermediate input to the electronic parts sector in Chubu region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	2,318,200	100.0%
1	Chubu	Electronic parts	714,356	30.8%
2	Chubu	Education, research	223,550	9.6%
3	Kanto	Electronic parts	155,961	6.7%
4	Kinki	Electronic parts	91,181	3.9%
5	Chubu	Other service for office	66,184	2.9%
6	Chubu	Nonferrous metal	62,274	2.7%
7	Chubu	Ceramics, stone and clay products	51,051	2.2%
8	Chubu	Electricity	50,720	2.2%
9	Kanto	Commerce	46,722	2.0%
10	Chugoku	Electronic parts	44,102	1.9%
11	Kanto	Education, research	41,960	1.8%
12	Tohoku	Electronic parts	41,434	1.8%
13	Chubu	Commerce	37,430	1.6%
14	Chubu	Plastic products	28,376	1.2%
15	Chubu	Finance, insurance	25,778	1.1%
16	Kanto	Other electrical machinery	25,124	1.1%
17	Chubu	Transportation	23,434	1.0%
18	Kinki	Commerce	22,369	1.0%
19	Chubu	Commodity lease service	22,093	1.0%
20	Kanto	Nonferrous metal	21,367	0.9%

○Intermediate input to the electronic parts sector in Kinki region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	1,819,664	100.0%
1	Kinki	Electronic parts	365,616	20.1%
2	Kinki	Education, research	190,447	10.5%
3	Chubu	Electronic parts	112,185	6.2%
4	Kanto	Electronic parts	111,040	6.1%
5	Kinki	Other service for office	71,871	3.9%
6	Kinki	Commerce	66,023	3.6%
7	Kanto	Education, research	61,995	3.4%
8	Kinki	Ceramics, stone and clay products	51,541	2.8%
9	Chugoku	Electronic parts	50,629	2.8%
10	Kinki	Nonferrous metal	39,009	2.1%
11	Kinki	Transportation	31,455	1.7%
12	Kinki	Electricity	31,218	1.7%
13	Kanto	Commerce	28,628	1.6%
14	Kinki	Commodity lease service	27,982	1.5%
15	Kinki	Finance, insurance	25,483	1.4%
16	Kyushu	Electronic parts	24,978	1.4%
17	Kinki	Other electrical machinery	24,942	1.4%
18	Kinki	Metal product	23,825	1.3%
19	Kanto	Other electrical machinery	22,605	1.2%
20	Kinki	Plastic products	19,256	1.1%
23	Tohoku	Electronic parts	17,558	1.0%

○Intermediate input to electronic parts sector in Tohoku region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	1,349,549	100.0%
1	Tohoku	Electronic parts	362,876	26.9%
2	Tohoku	Education, research	158,808	11.8%
3	Kanto	Electronic parts	101,356	7.5%
4	Kanto	Education, research	68,211	5.1%
5	Kanto	Commerce	39,756	2.9%
6	Kinki	Electronic parts	39,007	2.9%
7	Tohoku	Electricity	36,962	2.7%
8	Tohoku	Nonferrous metal	35,764	2.7%
9	Chubu	Electronic parts	29,701	2.2%
10	Tohoku	Other service for office	29,255	2.2%
11	Tohoku	Commerce	18,574	1.4%
12	Tohoku	Plastic products	17,536	1.3%
13	Tohoku	Transportation	16,778	1.2%
14	Tohoku	Finance, insurance	15,992	1.2%
15	Kanto	Nonferrous metal	15,841	1.2%
16	Kanto	Plastic products	15,816	1.2%
17	Tohoku	Metal product	14,655	1.1%
18	Kanto	Other electrical machinery	14,241	1.1%
19	Kanto	Metal product	13,563	1.0%
20	Tohoku	Ceramics, stone and clay products	13,464	1.0%

○Intermediate input to the electronic parts sector in Kyushu region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	1,235,025	100.0%
1	Kyushu	Electronic parts	213,241	17.3%
2	Kyushu	Education, research	115,078	9.3%
3	Kanto	Electronic parts	94,067	7.6%
4	Chubu	Electronic parts	68,019	5.5%
5	Kyushu	Other service for office	55,582	4.5%
6	Kanto	Education, research	50,312	4.1%
7	Kyushu	Electricity	41,150	3.3%
8	Kyushu	Commerce	37,387	3.0%
9	Kinki	Electronic parts	35,344	2.9%
10	Kyushu	Ceramics, stone and clay products	25,538	2.1%
11	Kyushu	Nonferrous metal	23,795	1.9%
12	Shikoku	Electronic parts	23,614	1.9%
13	Tohoku	Electronic parts	23,435	1.9%
14	Kyushu	Transportation	22,765	1.8%
15	Kinki	Ceramics, stone and clay products	22,423	1.8%
16	Kyushu	Finance, insurance	19,666	1.6%
17	Kinki	Education, research	16,725	1.4%
18	Kanto	Commerce	16,226	1.3%
19	Kyushu	Commodity lease service	16,178	1.3%
20	Kyushu	Plastic products	14,316	1.2%

○Intermediate input to the electronic parts sector in Chugoku region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	926,464	100.0%
1	Chugoku	Electronic parts	228,960	24.7%
2	Chugoku	Education, research	98,489	10.6%
3	Kanto	Electronic parts	77,806	8.4%
4	Chubu	Electronic parts	42,657	4.6%
5	Chugoku	Other service for office	29,680	3.2%
6	Chugoku	Electricity	22,586	2.4%
7	Kinki	Electronic parts	21,439	2.3%
8	Kanto	Education, research	18,926	2.0%
9	Kyushu	Electronic parts	18,049	1.9%
10	Chugoku	Nonferrous metal	16,681	1.8%
11	Kanto	Commerce	16,362	1.8%
12	Chugoku	Transportation	13,177	1.4%
13	Chugoku	Plastic products	13,084	1.4%
14	Kinki	Commerce	12,431	1.3%
15	Chugoku	Finance, insurance	12,355	1.3%
16	Kyushu	Ceramics, stone and clay products	11,577	1.2%
17	Chugoku	Metal product	11,241	1.2%
18	Chugoku	Commerce	10,556	1.1%
19	Tohoku	Electronic parts	9,667	1.0%
20	Kinki	Education, research	9,012	1.0%

○Intermediate input to the electronic parts sector in Shikoku region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	227,151	100.0%
1	Shikoku	Electronic parts	27,865	12.3%
2	Shikoku	Education, research	25,749	11.3%
3	Kanto	Electronic parts	22,281	9.8%
4	Kinki	Electronic parts	14,924	6.6%
5	Shikoku	Electricity	7,782	3.4%
6	Shikoku	Other service for office	7,519	3.3%
7	Tohoku	Electronic parts	7,234	3.2%
8	Chubu	Electronic parts	6,873	3.0%
9	Kyushu	Electronic parts	5,911	2.6%
10	Kanto	Education, research	5,747	2.5%
11	Kanto	Commerce	4,699	2.1%
12	Kinki	Other electrical machinery	4,494	2.0%
13	Shikoku	Finance, insurance	4,194	1.8%
14	Shikoku	Nonferrous metal	4,142	1.8%
15	Shikoku	Other electrical machinery	3,900	1.7%
16	Kinki	Commerce	3,505	1.5%
17	Shikoku	Transportation	3,316	1.5%
18	Kinki	Education, research	3,016	1.3%
19	Hokkaido	Electronic parts	2,509	1.1%
20	Shikoku	Commodity lease service	2,315	1.0%

○Intermediate input to the electronic parts sector in Hokkaido region

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Input total from endogenous sector	81,934	100.0%
1	Kanto	Electronic parts	16,114	19.7%
2	Kanto	Education, research	8,587	10.5%
3	Hokkaido	Electronic parts	6,545	8.0%
4	Tohoku	Electronic parts	4,693	5.7%
5	Hokkaido	Education, research	4,433	5.4%
6	Shikoku	Electronic parts	2,869	3.5%
7	Chubu	Ceramics, stone and clay products	2,330	2.8%
8	Hokkaido	Electricity	2,313	2.8%
9	Hokkaido	Commerce	2,173	2.7%
10	Kanto	Metal product	2,014	2.5%
11	Hokkaido	Other service for office	1,866	2.3%
12	Kyushu	Ceramics, stone and clay products	1,703	2.1%
13	Kinki	Education, research	1,316	1.6%
14	Kanto	Nonferrous metal	1,238	1.5%
15	Hokkaido	Transportation	1,238	1.5%
16	Hokkaido	Nonferrous metal	1,145	1.4%
17	Kanto	Ceramics, stone and clay products	931	1.1%
18	Chubu	Nonferrous metal	928	1.1%
19	Hokkaido	Finance, insurance	873	1.1%
20	Kinki	Electronic parts	870	1.1%

(Reference) The regional production amount of electronic parts

Region	Amount (million yen)	Percentage (%)
Whole industries	16,211,756	100.0%
Kanto	5,345,149	33.0%
Chubu	3,108,697	19.2%
Kinki	2,487,176	15.3%
Tohoku	1,848,970	11.4%
Kyushu	1,748,011	10.8%
Chugoku	1,248,958	7.7%
Shikoku	314,439	1.9%
Hokkaido	110,356	0.7%
Okinawa	0	0.0%

Notes:
1. Top 20 intermediate input sector of various domestic regions which have large amount of intermediate input to electronic parts sector in each region are extracted
2. The green shaded area is electronic parts sector of Tohoku region. The light blue shaded area is electronic parts sector of the region one belongs to. The yellow shaded area is electronic parts sector of other regions. The orange shaded area is electricity, transportation sector of the region one belongs to.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO (Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

(D) The status of intermediate input destination of the parts industry of the Tohoku region

So far, we inspected situation of automobile parts and electronic parts such as the Kanto region which was demand side of the intermediate input from Tohoku region, but now, from a contrasting viewpoint, we inspected to which region/sector the automobile parts and electronic parts sectors of Tohoku region provided intermediate input (Table 4-2-2-7). There are points, which are common, and also there are points of difference in the structure of intermediate input from the automobile parts sector and that from electronic parts sector in Tohoku region. The common point is that both sectors have much intermediate input to Kanto region other than the region one belongs, which is in accord with the structure viewed from demand side of the regions. However, there is a big difference between the two sectors as follows. In the automobile parts sector, the amount of input to automobile parts sector in Kanto region is the largest and accounts for approximately 30% in the total intermediate input, and input to the main automobile-related sectors in Kanto region (automobile parts, passenger car, other automobiles, other service to the office (automobile wholesales etc.)) and other transportation machines) accounts for nearly half of the total. The input to the automobile parts sector to Tohoku from the own region is merely 10% in the total, and total of the main automobile-related sector in the own region is merely 30% of the total.[16] But on the contrary, in the electronic parts sector, input to the main electronic related sectors of the own

[16] As for the export amount taken from the region in the Inter-Regional I/O Tables (CHIIKIKANHYO), the export amount of the product produced in the relevant region is accounted. Therefore the export amount of the automobile parts from Tohoku region is approximately 33,800 million yen, it is more than 3 times larger compared with the amount in the foreign trade statistics (approximately 10,500 million yen) which is actual amount exported from the port of the region. In addition, this is the same scale with production-based export amount (approximately 35,400 million yen) which we estimated from export freight flows in the previous section.

region (electronic parts, computer and its attachment, communication machine and related equipment) accounts for three top ranks, and in the whole endogenous sector of the own region, it accounts for over half. The input to main electronic related parts in Kanto region is merely 20% of the input to the own region, and in the whole endogenous sector it is only in the level of 30% (Table 4-2-2-8). In other words, whereas the automotive parts industry in the Tohoku region has stronger linkage with Kanto region, the electronic parts industry in Tohoku region has weak linkage with Kanto region compared with that of automotive parts industry. In addition, as for the total sum of the intermediate input, electronic parts sector has approximately 2.3 times larger sum than automobile parts sector. Also the level of the intermediate input to the parts industry is different. As for the destination of input of the automobile parts of Tohoku region, the relevant sector of each region is merely 50% (46.3%), and the input to finished products are small, but as for the destination of input of the electronic parts of Tohoku region, the relevant sector of each region remains in the level of less than 40% (38.8%). The proportion of input into the finished products line is relatively large. That is, it may be assumed that the automotive parts industry of Tohoku region includes not only manufacturing enterprises of primary parts (hereafter referred to as Tier1) but also many secondary parts or sub-parts manufacturers, (hereafter Tier2) in comparison with the electronic parts industry of the same region.

Table 4-2-2-7 Destination of intermediate input of the automobile parts and electronic parts sectors of Tohoku region

○ **Destination of Intermediate input of the automobile parts of the Tohoku region**

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Endogenous sector total	697,139	100.0%
(Reference)	(Tohoku)	(Export)	33,843	
1	Kanto	Automobile parts, accessories	198,612	28.5%
2	Kanto	Passenger car	103,023	14.8%
3	Tohoku	Automobile parts, accessories	80,253	11.5%
4	Kanto	Other automobiles	67,959	9.7%
5	Tohoku	Passenger car	59,192	8.5%
6	Tohoku	Other service for office	46,278	6.6%
7	Kyushu	Passenger car	27,183	3.9%
8	Kanto	Other service for office	22,158	3.2%
9	Chubu	Automobile parts, accessories	22,154	3.2%
10	Chubu	Passenger car	21,770	3.1%
11	Kinki	Automobile parts, accessories	10,060	1.4%
12	Kyushu	Automobile parts, accessories	8,860	1.3%
13	Kinki	Passenger car	4,539	0.7%
14	Chugoku	Passenger car	3,552	0.5%
15	Kyushu	Other automobiles	3,359	0.5%
16	Kanto	Other transportation machinery	3,294	0.5%
17	Kyushu	Other service for office	3,144	0.5%
18	Chugoku	Automobile parts, accessories	2,550	0.4%
19	Kinki	Other automobiles	2,062	0.3%
20	Chubu	Other automobiles	2,015	0.3%
21	Kinki	Other service for office	1,519	0.2%
22	Tohoku	Other transportation machinery	760	0.1%
23	Chubu	Other service for office	604	0.1%
24	Kinki	Other transportation machinery	508	0.1%
25	Chubu	Other transportation machinery	478	0.1%
26	Chugoku	Other automobiles	364	0.1%
27	Chugoku	Other service for office	173	0.0%
28	Tohoku	Other automobiles	163	0.0%
29	Hokkaido	Other service for office	116	0.0%

Notes:
1. The intermediate demand of various domestic regions (each endogenous sector) is extracted, where there is the intermediate input amount more than 100 million yen from automobile parts, accessories sector of Tohoku region.
2. The green shaded area is intermediate demand sector of the Kanto region. The orange shaded area is intermediate demand sector of other regions.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO(Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

○ **Destination of Intermediate input of electronic parts of the Tohoku region**

Ranking	Region	Sector	Amount (million yen)	Percentage (%)
	Whole country	Endogenous sector total	1,580,525	100.0%
(Reference)	(Tohoku)	(Export)	639,706	
1	Tohoku	Electronic parts	362,876	23.0%
2	Tohoku	Computer, attachment	183,149	11.6%
3	Tohoku	Communications machinery, related machinery	177,795	11.2%
4	Kanto	Electronic parts	145,982	9.2%
5	Kanto	Communications machinery, related machinery	84,982	5.4%
6	Kanto	Computer, attachment	48,377	3.1%
7	Kanto	Other electrical machinery	47,252	3.0%
8	Tohoku	Precision machinery	43,200	2.7%
9	Chubu	Electronic parts	41,434	2.6%
10	Kanto	Other service for office	30,657	1.9%
11	Tohoku	Equipment for office works and service	28,192	1.8%
12	Kanto	Precision machinery	27,459	1.7%
13	Tohoku	Other electrical machinery	26,565	1.7%
14	Kanto	Equipment for office works and service	23,986	1.5%
15	Kyushu	Electronic parts	23,435	1.5%
16	Tohoku	Other service for office	22,066	1.4%
17	Kinki	Electronic parts	17,558	1.1%
18	Chubu	Communications machinery, related machinery	14,333	0.9%
19	Kanto	Industrial use electric appliance	12,081	0.8%
20	Chugoku	Electronic parts	9,667	0.6%
21	Kanto	Automobile parts, accessories	9,365	0.6%
22	Kanto	General machinery	8,475	0.5%
23	Tohoku	Public service	8,140	0.5%
24	Tohoku	Industrial use electric appliance	8,134	0.5%
25	Shikoku	Electronic parts	7,234	0.5%
26	Kinki	Communications machinery, related machinery	6,911	0.4%
27	Chubu	Computer, attachment	6,210	0.4%
28	Chubu	Equipment for office works and service	6,134	0.4%
29	Tohoku	General machinery	5,473	0.3%
30	Kanto	Other manufacturing industry products	5,070	0.3%

Notes:
1. The intermediate demand of various domestic regions (each endogenous sector) is extracted, where there is the intermediate input amount more than 5 billion yen from electronic parts sector of Tohoku region.
2. The green shaded area is intermediate demand sector of the Kanto region. The orange shaded area is intermediate demand sector of other regions.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO(Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

Table 4-2-2-8 Comparison of the destination region of intermediate input of the automobile parts and electronic parts sectors of Tohoku region

○Automobile parts

Region	Amount (million yen)	Percentage (%)
Whole country	697,139	100.0%
Hokkaido	173	0.0%
Tohoku	186,720	26.8%
Kanto	395,183	56.7%
Chubu	47,025	6.7%
Kinki	18,708	2.7%
Chugoku	6,646	1.0%
Shikoku	77	0.0%
Kyushu	42,607	6.1%
Okinawa	0	0.0%

○Electronic parts

Region	Amount (million yen)	Percentage (%)
Whole country	1,580,525	100.0%
Hokkaido	15,230	1.0%
Tohoku	881,706	55.8%
Kanto	475,477	30.1%
Chubu	90,316	5.7%
Kinki	46,826	3.0%
Chugoku	17,998	1.1%
Shikoku	13,741	0.9%
Kyushu	38,306	2.4%
Okinawa	925	0.1%

Notes: The Destination of Intermediate input is endogenous sector total of each regions.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO(Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

(3) Structure of Japanese parts industry which can be observed from Tohoku region

We made the comparison between the regions to find out whether structure of the parts industry of the Tohoku region has any difference with structure of the parts industry of other regions.

At first we compared the structure in the intermediate destination of input and its percentage (Table 4-2-2-9). The input structure of the automobile parts sector varies depending on the region significantly. As for intermediate input destination of the automobile parts sector of Kyushu region, which has a scale of intermediate input of the same level as in the automobile parts sector of Tohoku region, Kyushu's intermediate input to the Kyushu region is the largest accounting for more than half of its total input and the second largest input is to Kanto, and Chubu regions, less than 20% in each region. This is significantly different from the structure of the same sector of Tohoku region. Also the input rate of the same sector of Hokkaido to the own region is less than that of Tohoku region, and the input to Chubu region, not to Kanto region, accounts for more than 70%. The two major regions of input source, input destination of the automobile parts in Kanto and Chubu make the input to the own region in around 70% level and secondly to the mutual region. Furthermore, the same sector of the Kinki region that has the bigger scale of intermediate input than Tohoku region make more input to adjacent Chubu region rather than to the own region, and the same sector of the Chugoku area make a lot of input to the own region and has a relatively little linkage with other regions.

Table 4-2-2-9 Comparison of the destination regions of intermediate input of automobile parts, electronic parts sectors of various domestic regions

○ Automobile parts

Destination of Input	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Whole country
Destination of input Hokkaido	5.7%	0.0%	0.1%	0.9%	0.1%	1.6%	0.2%	0.0%	0.0%	0.6%
Tohoku	0.4%	26.8%	1.3%	2.6%	0.5%	1.7%	0.4%	1.1%	0.0%	2.5%
Kanto	13.7%	56.7%	73.5%	14.0%	15.9%	7.7%	6.6%	17.6%	0.0%	38.5%
Chubu	73.2%	6.7%	16.2%	66.6%	32.1%	5.5%	9.9%	18.9%	0.0%	37.0%
Kinki	2.4%	2.7%	2.0%	5.9%	31.0%	6.0%	44.2%	1.3%	0.0%	5.5%
Chugoku	1.1%	1.0%	1.6%	4.0%	14.2%	67.0%	7.0%	6.0%	0.0%	8.6%
Shikoku	0.0%	0.0%	0.1%	0.3%	0.0%	0.6%	21.9%	0.0%	0.0%	0.2%
Kyushu	3.6%	6.1%	5.1%	5.5%	6.2%	9.6%	9.7%	55.1%	0.0%	7.1%
Okinawa	0.0%	0.0%	0.0%	0.1%	0.0%	0.2%	0.0%	0.0%	100.0%	0.1%
Whole country	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Amount of intermediate input (hundred million yen)	1,623	6,971	99,607	102,926	13,387	20,063	154	7,001	1	251,735

○ Electronic parts

Destination of Input	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa	Whole country
Destination of input Hokkaido	20.6%	1.0%	1.1%	0.0%	0.2%	0.0%	3.7%	0.1%	0.0%	0.8%
Tohoku	2.5%	55.8%	5.6%	2.7%	4.7%	1.0%	5.6%	1.4%	0.0%	10.1%
Kanto	52.0%	30.1%	71.3%	22.2%	28.8%	34.0%	50.8%	38.4%	0.0%	44.0%
Chubu	3.7%	5.7%	7.6%	57.4%	9.8%	10.4%	2.8%	5.6%	0.0%	18.0%
Kinki	9.1%	3.0%	6.6%	10.5%	50.3%	12.0%	2.8%	7.8%	0.0%	14.1%
Chugoku	2.8%	1.1%	3.4%	2.8%	2.1%	41.2%	0.8%	3.9%	0.0%	5.8%
Shikoku	4.0%	0.9%	1.0%	0.5%	1.4%	0.2%	18.9%	1.3%	0.0%	1.3%
Kyushu	5.2%	2.4%	3.3%	3.9%	2.8%	1.2%	14.5%	41.5%	0.0%	5.8%
Okinawa	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.1%
Whole country	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Amount of intermediate input (hundred million yen)	1,134	15,805	46,492	27,779	20,286	10,909	2,898	8,592	4	133,899

Notes: Destination of Intermediate input is the endogenous sector total. The yellow shaded area indicates the rate of intermediate input to the region one belongs to. The green shaded area indicates the regions which have intermediate input percentage of higher than 10%. The orange shaded area indicates regions which have intermediate input percentage higher than that to the region one belongs to. Total may not become 100% due to rounding off.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO(Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

The electronic parts sector has a structure different from the automobile parts sector, and the input structure is supposed to have characteristics in common with various regions. The dispersion in the amount of intermediate input from various regions is smaller than in automobile parts sector. Input to Kanto region is the biggest with 44%, input to Chubu, Kinki, and Tohoku exceeds 10%, dispersion in input source and input destination is generally big. And also, Except Hokkaido,

Shikoku region with little intermediate input amount, each region has made the largest input to the own region, and the second largest input is to Kanto region.

Then, we compared the structure of the re-input in the sector (Table 4-2-2-10). The entire structure of the automobile parts sector, like the same sector of Tohoku region in the whole country level, has 10% more re-input rate in the same sector than electronic parts sector (47.4% in automobile parts, 37.3% in electronic parts), resulting in the vertical specialization production structure. Further, the intermediate destination of input of the automobile parts sector of Kyushu region that has a scale of intermediate input of the same level as in the automobile parts sector of Tohoku region has lower re-input rate in the sector in contrast. The re-input percentage in sector from Kinki area and to the west is lower than national average. And the biggest regions for re-destination of input in the total are Chubu region, indicating that the degree of accumulation of the automotive parts industry is big there.

Table 4-2-2-10 Re-input etc. by the automobile parts, the electronic parts sectors of various domestic regions to the same sectors

(Automobile parts)	Amount of re-input to automobile parts (hundred million yen)	Total amount of intermediate input (hundred million yen)	Rate of re-input (%)	The first place re-input region	The second place re-input region
Hokkaido	915	1,623	56.4%	Chubu	Kanto
Tohoku	3,226	6,971	46.3%	Kanto	Tohoku
Kanto	43,869	99,607	44.0%	Kanto	Chubu
Chubu	54,899	102,926	53.3%	Chubu	Kanto
Kinki	6,040	13,387	45.1%	Chubu	Kinki
Chugoku	7,598	20,063	37.9%	Chugoku	Kanto
Shikoku	51	154	33.0%	Kinki	Chugoku
Kyushu	2,780	7,001	39.7%	Kyushu	Chubu
Okinawa	0	1	0.0%		
Whole country	119,378	251,735	47.4%	Chubu	Kanto
(Electronic parts)	Amount of re-input to automobile parts (hundred million yen)	Total amount of intermediate input (hundred million yen)	Rate of re-input (%)	The first place re-input region	The second place re-input region
Hokkaido	402	1,134	35.5%	Kanto	Hokkaido
Tohoku	6,129	15,805	38.8%	Tohoku	Kanto
Kanto	15,004	46,492	32.3%	Kanto	Chubu
Chubu	11,705	27,779	42.1%	Chubu	Kanto
Kinki	7,575	20,286	37.3%	Kinki	Kanto
Chugoku	4,583	10,909	42.0%	Chugoku	Kanto
Shikoku	998	2,898	34.4%	Kanto	Shikoku
Kyushu	3,491	8,592	40.6%	Kyushu	Kanto
Okinawa	0	4	0.0%		
Whole country	49,886	133,899	37.3%	Kanto	Chubu
(Electronic parts)	Amount of input to automobile parts (hundred million yen)	Total amount of intermediate input (hundred	Rate of re-input (%))	The first place re-input region	The second place re-input region

		million yen)			
Hokkaido	28	1,134	2.5%	Kanto	Hokkaido
Tohoku	206	15,805	1.3%	Kanto	Chubu
Kanto	1,164	46,492	2.5%	Kanto	Chubu
Chubu	1,334	27,779	4.8%	Chubu	Kanto
Kinki	349	20,286	1.7%	Kinki	Chubu
Chugoku	345	10,909	3.2%	Chugoku	Chubu
Shikoku	94	2,898	3.3%	Kanto	Kyushu
Kyushu	265	8,592	3.1%	Kyushu	Kanto
Okinawa	0	4	0.0%		
Whole country	3,785	133,899	2.8%	Chubu	Kanto

Notes: The yellow shaded area indicates that the region has re-input percentage higher than that of national average. The re-input region is re-input region other than the region one belongs to.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO(Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

And also, Kanto region is the largest destination of re-input of the electronic parts sector, which indicates that accumulation of the electronic parts industry is most advanced.

In consideration of a lot of electronic parts such as IC tips for vehicle being incorporated in automobile parts in late years, we checked about the input from electronic parts sector to automobile parts sector (the input from electronic parts to completed automobile was very little). The input rate is not so high, 2.8% on national average, and amount of input from Kanto region is more than 100 billion yen which amount next to Chubu region, but the input rate was 2.5% that is less than the national average. On the other hand, Chubu region has the highest input rate of 4.8%. The Nishi-Nippon region excluding Kinki region has the higher input rate than the national average.

Finally we compare the percentage of export with the intermediate input mainly by inspecting demand for parts industry constitution in various regions (Table 4-2-2-11). First of all the ratio of the intermediate input is different from export (on the industrial linkage it is classified as a part of final demand) between both sectors significantly even in the same parts industry. On national average, rate of automobile parts of export is 13.7%, domestic intermediate input is 85.8%, whereas the rate in the electronic parts is 31.9% and 66.9% respectively. Export rate of the latter is nearly 20% above. The ratio of export of Tohoku region is lower than national average; especially the export of automobile parts ratio is significantly lower, 4.6%.

On the other hand, the Kyushu region with almost the same scale in both sectors has the quite different structure. In export ratio, automobile parts (34.8%) and electronic parts (55.8%) exceed national average significantly, marking the best ratio in the region. And also, in automobile parts sector the export ratios from Kinki and Chubu regions are higher than national average, and in electronic parts sector, export ratio from Kanto and Kinki region is higher than national average. Greater amount of production does not necessarily correspond with higher export ratio.

Table 4-2-2-11 Comparison of the demand structure of automobile parts, electronic parts of various domestic regions

(Automobile	Structure	Whole	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa

parts)		country									
Intermediate input	(1)	85.8%	86.2%	94.9%	87.9%	84.9%	83.1%	89.8%	95.7%	64.7%	80.4%
Domestic final demand	(2)	0.5%	0.8%	0.5%	0.4%	0.5%	0.8%	0.4%	2.0%	0.4%	9.8%
Export	(3)	13.7%	13.0%	4.6%	11.6%	14.6%	16.1%	9.8%	2.3%	34.8%	9.8%
Total demand	(4)(=(1)＋(2)＋(3))	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Import	(5)	-2.3%	-2.3%	-2.3%	-2.6%	-1.8%	-2.7%	-2.6%	-11.9%	-3.9%	-81.4%
Production in the region	(4)-(5)	97.7%	97.7%	97.7%	97.4%	98.2%	97.3%	97.4%	88.1%	96.1%	18.6%
(Amount of total demand)	(4) Amount (hundred million yen)	293,261	1,882	7,350	113,296	121,297	16,114	22,347	161	10,813	1
(Rate of total demand)	(4) Share of region	100.0%	0.6%	2.5%	38.6%	41.4%	5.5%	7.6%	0.1%	3.7%	0.0%
(Electronic parts)	Structure	Whole country	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu	Okinawa
Intermediate input	(1)	66.9%	85.9%	70.2%	66.2%	72.8%	66.9%	74.0%	80.6%	44.4%	80.2%
Domestic final demand	(2)	1.2%	1.3%	1.4%	1.5%	1.1%	1.0%	2.3%	1.7%	-0.1%	19.8%
Export	(3)	31.9%	12.8%	28.4%	32.3%	26.0%	32.1%	23.7%	17.7%	55.8%	0.0%
Total demand	(4)(=(1)＋(2)＋(3))	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Import	(5)	-19.0%	-16.4%	-17.9%	-23.8%	-18.5%	-18.0%	-15.3%	-12.6%	-9.7%	-100.0%
Production in the region	(4)-(5)	81.0%	83.6%	82.1%	76.2%	81.5%	82.0%	84.7%	87.4%	90.3%	0.0%
(Amount of total demand)	(4) Amount (hundred million yen)	200,201	1,321	22,529	70,177	38,134	30,338	14,738	3,597	19,363	5
(Rate of total demand)	(4)Share of region	100.0%	0.7%	11.3%	35.1%	19.0%	15.2%	7.4%	1.8%	9.7%	0.0%

Notes: Destination of Intermediate input is the endogenous sector total. Total may not become 100% due to rounding off.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO(Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

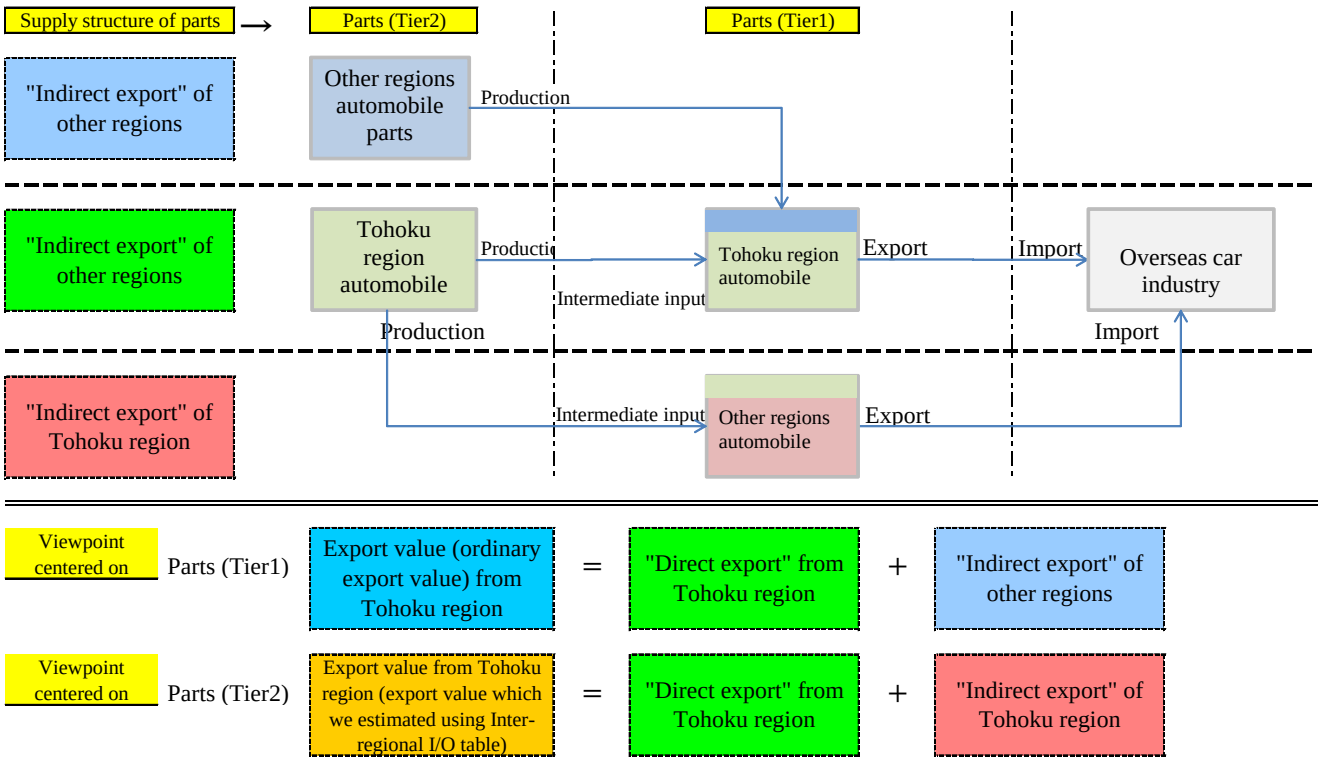
(4) The impact that Tohoku region gives to the export of automobile parts of Japan

As stated above, although direct export ratio of Tohoku region especially of automotive parts industry is low, "indirect export"[17] is done in particular through intermediate input into production/export of automotive parts from Kanto region. In global supply-chain, to inspect export structure of Japanese automotive parts industry adopting the vertical specialization of production system, it is important for us to consider not only the direct export from the region but also the indirect export. By estimating these indirect exports, we analyzed the size of the impact on the global supply-chain caused by stagnation of export of automobile parts from the Tohoku region due to this earthquake disaster. First of all, we have broken down the structure of the global

[17] The definition of indirect export is indicated in the first paragraph of Section 2-2 (1).

supply-chain of the automobile parts originating from the Tohoku region into patterns (Figure 4-2-2-12)[18].

Figure 4-2-2-12 Global supply-chain of automobile parts originated from Tohoku region



Notes: "Direct export" refers to the export of the portion which production and intermediate input of the entire parts (both Tier1 and Tier2) are completed within the region, and "Indirect export" refers to the export of the portion which is exported after the parts (Tier2) produced in the region were intermediately input into the parts (Tier1) produced in the other regions.
Source: Compiled from the data of Ministry of Economy, Trade and Industry.

The export from Tohoku region is roughly divided into three patterns. The first is the case where both the production of the parts (Tier2) and the production of export parts (Tier1) into which the intermediate input was made, are performed in Tohoku region. We will call this as "direct export from Tohoku region". The second is the case where the production of Tier2 is conducted in the region other than Tohoku, and it is input intermediately into Tier1, which is manufactured in Tohoku region. We call this as "indirect export of the products produced in other regions". The third is the case where, Tier2, which was produced in Tohoku region, is input intermediately into Tier1, which was produced in other regions. We call this "indirect export of products of Tohoku region".

According to this classification, the export amount from Tohoku region included in the ordinary

[18] In order to classify the pattern clearly, we have divided the automobile parts sector focusing on only two kinds of Tier1 and Tier2 in this report, but actually in order to understand indirect export, it is necessary to consider the tertiary parts (Tier3) or even the parts under sub-category, which are incorporated in these primary and secondary parts.

region table is the sum of "direct export from Tohoku region" and "indirect export to other regions". The export amount included is the export amount focusing on Tier1, which was produced in Tohoku region. On the other hand, the export amount focusing on Tier2 produced in Tohoku region, which can be estimated by using Inter-Regional I/O Tables (CHIIKIKANHYO)[19] is the sum of "direct export from Tohoku region" and "indirect export of the products of Tohoku region", and if this export amount is bigger than ordinary export amount, the impact that Tohoku region gives on the global supply-chain may be supposed to be potentially bigger one than expected.

The result from the estimation (Table 4-2-2-13) shows that the export amount of the automobile parts from Tohoku region by estimate is approximately 63 billion yen, which account for approximately 1.6% of export from the whole country. The export amount usually included is approximately 34 billion yen, approximately 0.8% of national export and becomes the size of approximately 2 times larger when indirect export is taken into consideration. The export structure of the automobile parts from Tohoku region, and the ratio of the indirect export is as high as more than 60%, two times larger than direct export ratio, unlike major export regions such as Chubu region and Kanto region. The data shows that Tier2 produced in Tohoku region is exported after it was input intermediately into Tier1 of mainly Kanto region (more than 70%).

[19] For example, "The indirect export of products of Tohoku region" is estimated from the following calculation. The ratio of amount, input intermediately from automobile parts sector of Tohoku region is determined by the total sum (total of endogenous sector) intermediately input to automobile parts sector of other regions such as Kanto region. The above ratio is multiplied by export amount of the automobile parts sector from other regions such as Kanto region. We have made estimation in other regions by using similar method for the followings.

Table 4-2-2-13 Export structure of automotive parts industry in consideration of Japanese indirect export

	①	②	③	①＋②		①＋③				
Region	"Direct export" from the region one belongs to	"Indirect export" of other regions	"Indirect export" of the region one belongs to	The export value from the region concerned (viewpoint centered on Tier1)	Percentage by region	The export value from the region concerned (viewpoint centered on Tier2)	Percentage by region	Ratio of "direct export"	Ratio of "indirect export"	The largest input region (percentage in the whole) of the left colum
Hokkaido	15,601	8,857	16,154	24,458	0.61%	31,754	0.79%	49.1%	50.9%	Chubu (86.6%)
Tohoku	22,355	11,488	40,534	33,843	0.84%	62,889	1.57%	35.5%	64.5%	Kanto (73.8%)
Kanto	1,142,951	175,817	204,750	1,318,768	32.91%	1,347,701	33.64%	84.8%	15.2%	Chubu (55.8%)
Chubu	1,573,766	200,960	271,634	1,774,726	44.29%	1,845,400	46.06%	85.3%	14.7%	Kanto (39.5%)
Kinki	162,353	97,320	76,240	259,673	6.48%	238,594	5.95%	68.0%	32.0%	Chubu (59.0%)
Chugoku	170,959	47,372	48,892	218,331	5.45%	219,851	5.49%	77.8%	22.2%	Kyushu (26.2%)
Shikoku	194	169	938	363	0.01%	1,133	0.03%	17.2%	82.8%	Kinki (73.5%)
Kyushu	233,656	142,881	25,726	376,537	9.40%	259,383	6.47%	90.1%	9.9%	Chubu (52.4%)
Okinawa	5	5	0	10	0.00%	5	0.00%	100.0%	0.0%	None
Whole country total	3,321,840	684,869	684,869	4,006,709	100.00%	4,006,709	100.00%	82.9%	17.1%	Chubu (29.3%)

Notes: Unit is million yen except the percentage.
Source: "HEISEI 17-NEN (2005) CHIIKIKANN SANGYO KANRENHYO (Inter-regional I/O table) (53 sector transaction amount table)" (March, 2010) (Ministry of Economy, Trade and Industry)

According to survey[20] of the Tohoku Bureau of Economy, Trade and Industry 2004, characteristics of the automobile related industry in Tohoku region include; (a) The wide-area collaboration type accumulation open to the outside the area is formed in business relationship, and (b) structure of the region industry such as electricity, information and communication equipment, electronic parts, precision instruments, and industrial accumulation are formed with variety. As we have inspected so far, products of Tohoku region, in particular automobile parts are input intermediately in large quantities to machine industry mainly automotive parts industry in outside of the region. The relationship between procurement and sales including the relationship in the own regions and electronic parts industries are presently getting closer, and it is considered that this characteristic is more clearly observed[21].

And also, it seems that export structure of the automotive parts industry in various regions have different characteristic in each. The regions having large ratio of indirect export focused on Tier2

[20] Tohoku Bureau of Economy, Trade and Industry (2004): "A survey toward accumulation, activation of the automobile related industry in Tohoku" P.26-31.

[21] The approach based on the policy is under way. In May, 2007, "Collaboration conference for Tohoku car industry accumulation" was established, measures of the wide-area collaboration which six prefectures of Tohoku participating in. The conference is intending to establish "A big accumulation base in the Northern territory" of Japanese automobile related industry, through the activities; (a) Information sharing, (b) Seminar and exchange party, (c) Technical exhibition and trade fair (d) Business expansion support, (e) Promotion of Research and development etc.

like Tohoku region are Hokkaido and Shikoku region. The Chubu region have received much input to Tier1 from Hokkaido, and Kinki region have much from Shikoku region, each have different region connection. The automotive parts industry of Kyushu region has considerably different structure from these with focus on Tier2. Since this industry has big direct export ratio of approximately 90% of Tier1, and much intermediate input of Tier2 from other regions, the estimated export amount is around two-thirds of the ordinary export amount. Tohoku region and Kyushu region have characteristic in common in increased industrial accumulation including automobile parts in late years, but structure of the automotive parts industry in the region is different each other. As for the impact on export, it is necessary to evaluate after having fully considered the position of each region in global supply-chain.

In this section-2, we have examined not only the direct export from the own region but also the situation of the intermediate input from various domestic regions to the major export regions from Inter-Regional I/O Tables (CHIIKIKANHYO), focusing on automobile parts, electronic parts industry of Tohoku region, and we confirmed that each region in Japanese economy is connected indirectly with the world economy. In conclusion, in only two parts industries i.e. automobile parts and electronic parts, there are considerable different structures by sector and by regions. Therefore it is necessary to examine the situation of the Japanese economy, in consideration of varieties of worlds with which each Japanese region is in contact[22].

3. Measures undertaken by the industry toward the recovery of global supply-chain

(1) Status of production activities, and procurement of raw materials/ parts/ materials after the earthquake disaster

Just after the earthquake disaster, production stops at many bases around the disaster-stricken area, production activities of the domestic companies had a significant influence over that. At the same time all parts of the world expressed concerns over stoppage of the global supply-chain from Japan (Figure 4-2-3-1). In fact, by suspended or reduced production activities of large number of companies with world eminent production share, parts and materials are not supplied stably, which affected the production activity not only in Japan but also in some companies overseas.

On April 26, 2011, Ministry of Economy, Trade and Industry prepared "Industry actual state emergency survey after the Great East Japan Earthquake"[23]and later announced the results. As of the beginning of April, approximately more than 60% of the damaged production base of the respondent manufacturing companies has already finished recovery, and meanwhile recovery is steadily on the way in other bases, the remaining 30% of the damaged bases are considered to have

[22] As the principal objective is to investigate the structure, all the values are based on Inter-Regional I/O Tables (CHIIKIKANHYO), 2005, they may not reflect the most recent trend completely.

[23] The survey was conducted in order to understand the industry's actual state after this earthquake disaster (recovery situation and prospect of the production base in the stricken area, the stagnation of production through supply restriction of products and materials caused by the earthquake disaster and impact on consumption by the expanse of self-restraint mood etc.). The survey period: from April 8 to April 15, 2011: Companies interviewed: 80 companies (55 manufacturing industries and 25 retail, service industries).

completed recovery possibly by the middle of July (Figure 4-2-3-2).

The quick recovery may be attributable to quick first action of the Japanese manufacturing enterprise in early stage. The company, which had grasped the impact on company's supply chain (damage situation of the procurement, availability of the material procurement) within one week after this earthquake disaster accounts for more than 60% in material industry, 40% in processing industry. Additionally, as for the alternative procurement of raw materials, parts and materials, which are difficult to procure by this earthquake disaster, over 80% of the processing industries and over 60% of the material industries have secured alternative source of procurement (Figure 4-2-3-3). Furthermore, the alternative Source: of procurement are located not only in overseas countries but also widely located in various domestic regions in Japan (Figure 4-2-3-4).

Furthermore, about time (estimation) by which enough quantity of procurement can be secured, in the raw material industry, 54% of companies (including 8% which have completed procurement in respondents) are expecting normalization of procurement by July, 85% are expecting by October. Additionally, in the processing industries, 29% of companies (including 6% which have completed procurement in respondents) are expecting normalization of procurement by July, 71% are expecting by October (Figure 4-2-3-5).

As stated above as of approximately one month after this earthquake disaster, although there is the variety depending on individual company and the base location, it can be said that the production activities have been recovered to some extent. The recovery activities are under way continuously, and early recovery of the global supply-chain where Japanese companies play an important role is expected.

Figure 4-2-3-1 Expression of concern in the economic report by FRD of U.S.A. (published on April 13, 2011)

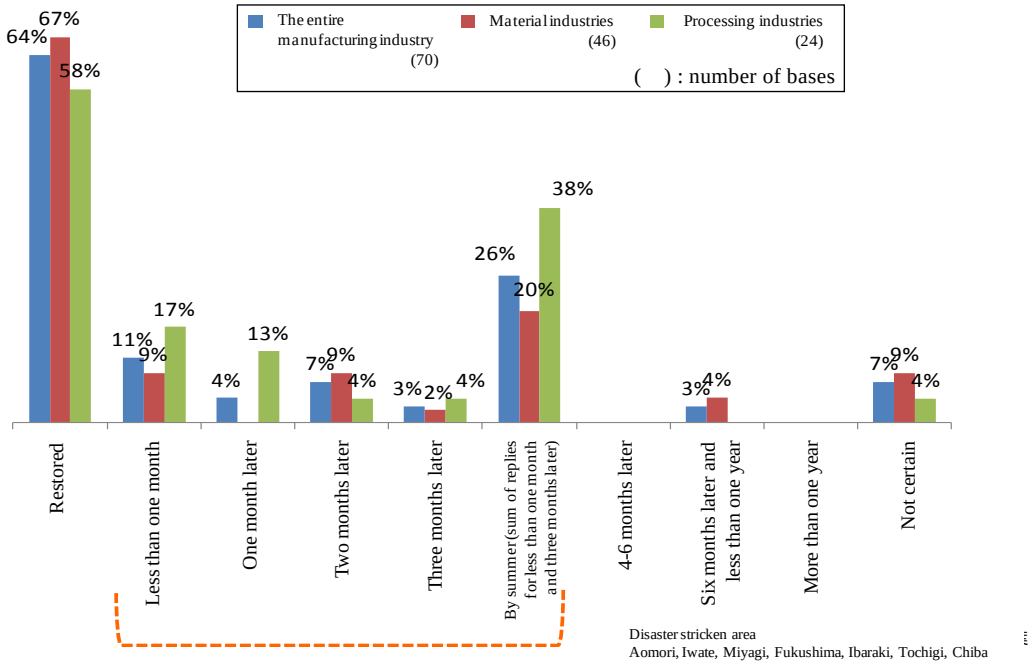
Summary of U.S district FRB economic report (Beige book) (published on April13, 2011)

About US economic activities from the end of February, 2011 to early April,
(a) As the economic assessment it reported that" economic activity generally continued to improve" and reports from the twelve Federal Reserve Districts indicated that recovery continued since the last report in March.
(b) 7 Districts including Boston and Philadelphia mentioned their concern about impact on supply chain (procurement, supply network) saying that "stoppage of sale and the production happened and might happen" by an earthquake disaster. Also dropping of Japanese tourists in Hawaii was reported.

District	Mention about the impact of the Great East Japan Earthquake
Boston	Concern about electronic parts-related supply chain.
Philadelphia	The retail stock of the electric appliance is insufficient. At a dealer stage "beginning" of supply interruption of vehicle and parts.
Richmond	Restriction on order for automotive paint
Atlanta	There is not the stoppage of the specific supply chain, but concerned about temporary interruption in automobile and IT.
Chicago	Along with an increase in gas price, concern of production activity restraint caused by the earthquake disaster of Japan.
Minneapolis	41% of companies replied that they were under some kind of influences by the earthquake disaster, such as delayed delivery of the plastic resin,
Dallas	Adverse effects on exporters. Some company are pessimistic that vessel service may not be normal until September.
San Francisco	Japanese tourists to Hawaii largely decreased.

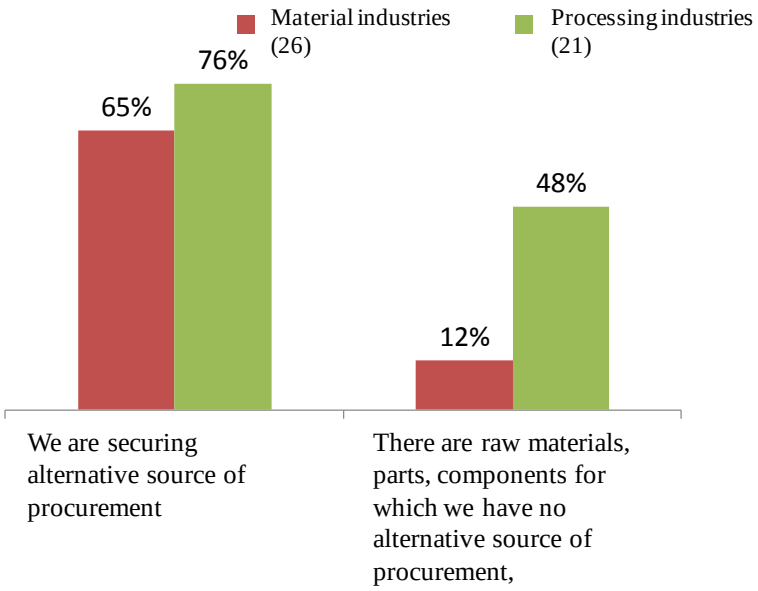
Source: "FRB economic report" (Beige book) (published on April 13, 2011) (FRB)

Figure 4-2-3-2 Status and forecasts of production base recovery in the disaster stricken area



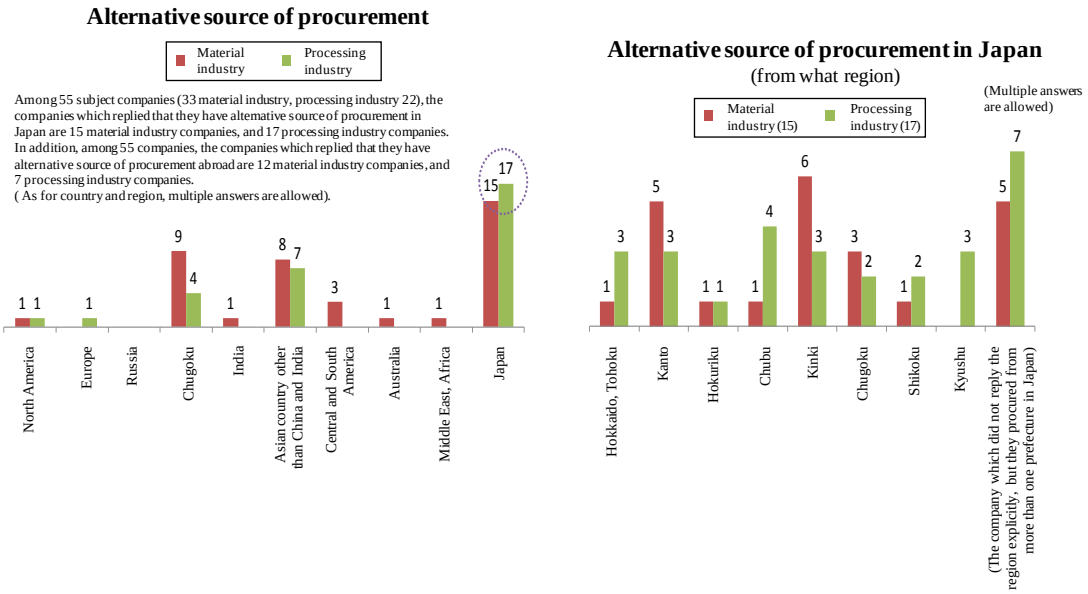
Notes: Some companies have damage at plural bases, and therefore the number of the bases (70) is bigger than the number of the companies (55).
Source: "Urgent survey on industry actual state after the Great East Japan Earthquake" (April, 2011) (Ministry of Economy, Trade and Industry)

Figure 4-2-3-3 Alternative source of procurement for raw materials, parts, components of Japanese companies



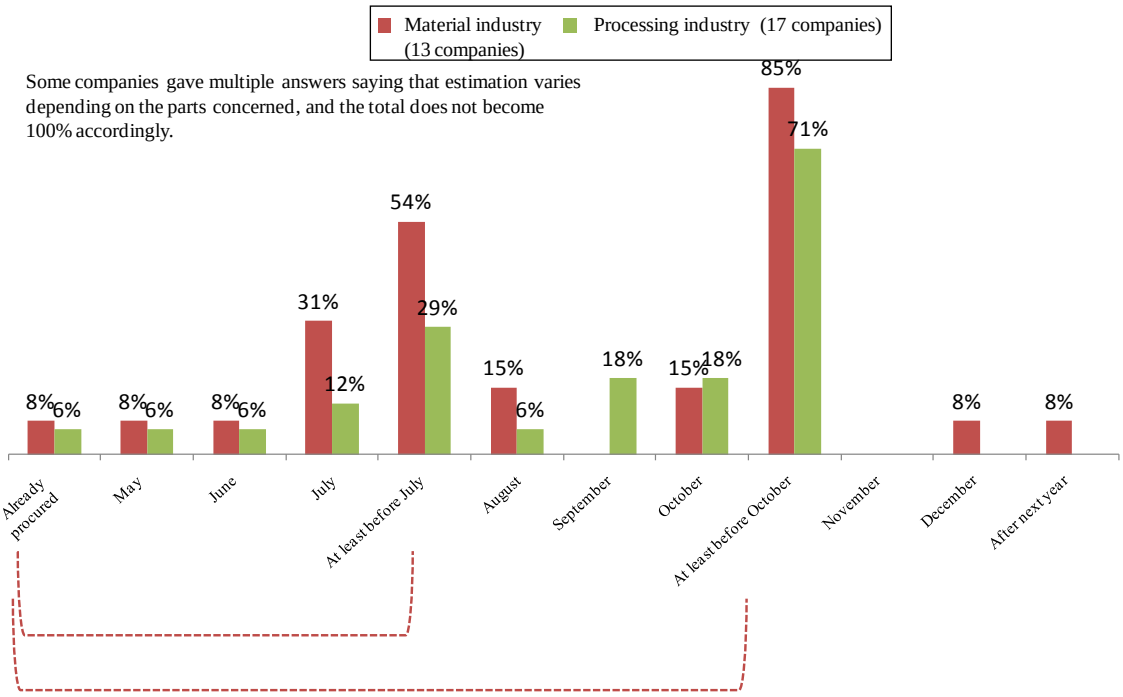
Notes: Some companies use a plurality of raw materials, parts, components, so multiple answers are allowed.
Source: "Urgent survey on industry actual state after the Great East Japan Earthquake" (April, 2011) (Ministry of Economy, Trade and Industry)

Figure 4-2-3-4 Alternative source of procurement of Japanese company (inside and outside the country) by region



Source: "Urgent survey on industry actual state after the Great East Japan Earthquake" (April, 2011) (Ministry of Economy, Trade and Industry)

Figure 4-2-3-5 The time (estimation) when Japanese company can secure enough procurement volumes

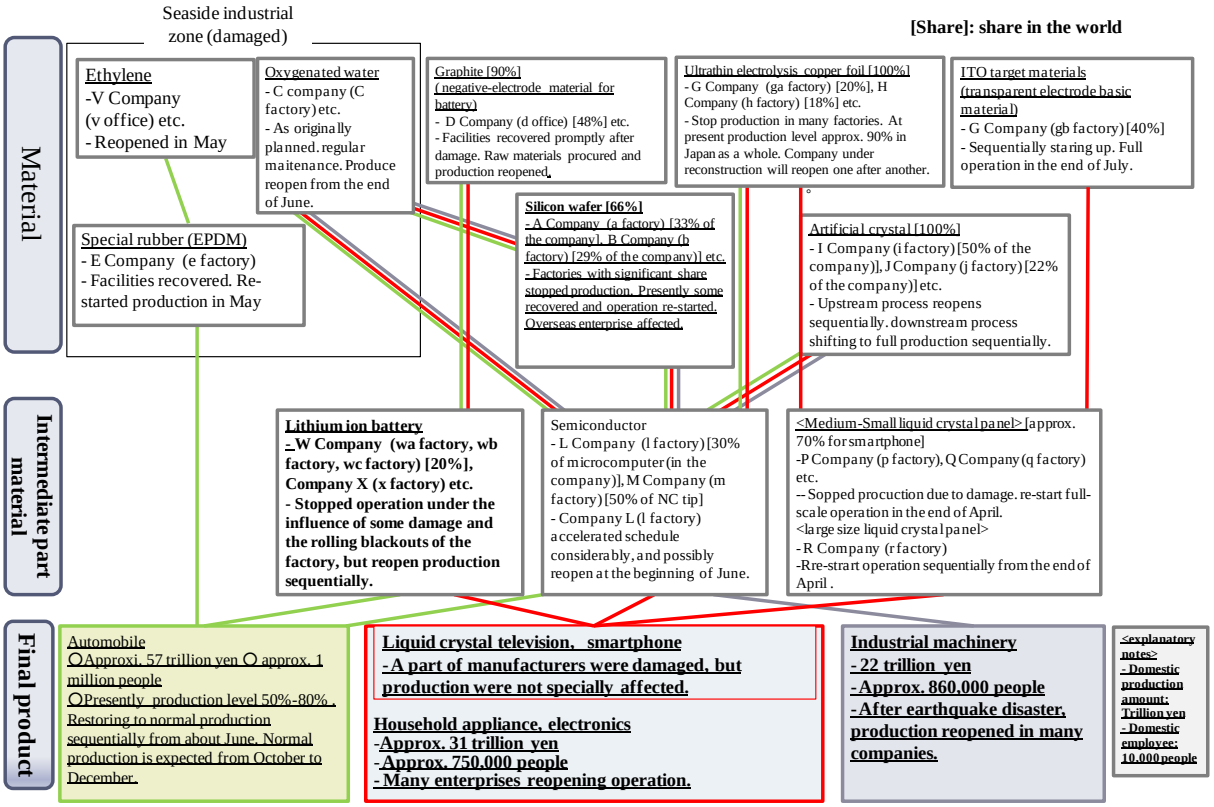


Notes: Some companies gave multiple answers saying that estimation varies depending on the parts concerned, So the total does not become 100%.
Source: "Urgent survey on industry actual state after the Great East Japan Earthquake" (April, 2011) (Ministry of Economy, Trade and Industry)

(2) Measures undertaken by the industry toward the recovery of global supply-chain

With their whole-hearted efforts, and support by the nationwide related business circles, the damaged companies and the areas, have started the recovery of their damaged production base making progress rapidly than initially envisioned. The factory of the major enterprise reopened the operation ahead of schedule one by one; and continue efforts for full operation and increase in production. In some factories, the impact of this earthquake disaster is so big that the situation must be watched closely, but if we look around the whole economy of Japan, we can find positive and steady movement for reconstruction, such as reinforced power supply to the electric company by the blast furnace companies, the surges in demand for electric wire for houses. Below, we will give an overview of situation of approaches by the industry as of the end of May, 2011 (Figure 4-2-3-6).

Figure 4-2-3-6 The impact of this earthquake disaster extended to the whole supply chain of Japan



Source: Compiled from "The subcommitee on basic policy of the Industrial Structure Council (Third) data 3" (May 31, 2011) (Ministry of Economy, Trade and Industry)

(A) The general condition of the electronics related industry

Although the factories, which produce materials and parts, were damaged by this earthquake disaster, they are recommencing production one after another. It is expected that there is no significant impact on production of electronics products such as thin-screen TV, cell-phone, smart phone, and lithium ion battery. For example, one enterprise that were producing/exporting silicon wafer[24] received damage on the factory by this earthquake disaster, but already the factory has reopened the operation one after another. They are expecting to return the production to the previous level before the earthquake disaster by about the end of June.

(B) The general condition of the aircraft related industry

Although in some factories production are stopped or reduced temporarily just after this earthquake disaster, they are now restored, or they have started operation totally in May. The full-scale production is expected to begin soon in June. For example, in one enterprise producing

[24] Single crystal of high purity silicon (99.999999999%) cut to a sliced laminate. Used as a board of semiconductors for cell-phone, digital appliance and automotive microcomputer.

and exporting turbine blade and engine disk[25] used in the aircraft engine, although their factory suffered damage from this earthquake disaster, they started operation in all processing line building on May 9, and full-scale production was started, and they will catch-up with their delivery schedule from this point onward. Additionally, they are now devising a new production schedule toward further increase in production.

(C) The general condition of the automobile related industry

Just after the earthquake disaster, the production of automobile was reduced or stopped in the whole country, but now, production has gradually started with adjusted operation speed for the car model that is possible to manufacture.

For example, one enterprise that was producing/exporting oil seal parts, although their factory suffered damage, they have already restarted production. In one enterprise that was producing/exporting luster pigment used in painting, the factory suffered damage and stopped production temporarily, but it has started the normal operation on May 8. In one company that was producing/exporting ECU, airflow sensor, and power module for inverter[26] stopped the production temporarily due to the damage, but has now almost completed the recovery process by the end of March.

And, In one enterprise that was producing/exporting the microcomputer which is utilized in a wide range of products such as automobile, electric machine, and industrial machine, the factory stopped the operation due to the earthquake disaster, but as a result of their full scale efforts for restarting production (mass production wafer) in 200mm product line, they have significantly moved up the restarting schedule to June 15 which was originally scheduled for July. After that on May 11 they announced that the production using 200mm product line (mass production wafer) will be reopened on June 1 (original schedule June 15), and the production using 300mm product line will be reopened on June 6 (original schedule July).

In other industries, for example, in steel and the chemical industries, the production in the major factory has been reopened about the middle of May and, machine industry returned to almost the same production level existing before this earthquake disaster. In short, the production in most of the production bases has been reopened.

This situation indicates "toughness" of the Japanese industries anew. From now on the government will provide assistance at full scale to make the global supply-chain stronger than ever by supporting the recovery, strengthening the collaboration of upstream and downstream industries, enhancing competitive power of the core parts and raw material industries to Japanese advantage, and build the global supply-chain with efficiency and increase capabilities to withstand any risk.

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[25] A turbine blade is normally a slim board with wing shaped blades, which rotates a disk by receiving flow of gas from the front. An engine disk is a disk attached to the shaft of the engine. Turbine blades are attached to the circumference of the disk.

[26] ECU is a device to control engine, transmission, air bag etc. electronically. An air flow sensor is a sensor measuring quantity of air inhaled by engine, one of the important components affecting gasoline mileage performance. A power module for inverter is a device which converts DC to AC.