

Trends in Technology Exports from Japan – FY 1994 –

(NISTEP Report No. 47)

3rd Policy-Oriented Research Group

1. General

NISTEP has been conducting questionnairing with private companies since FY 1992 to analyze the quality aspect of technology exports as such analysis had not been made in the conventional technology trade statistics, and present the results as reports. The present survey was conducted to also investigated companies with a capital of less than 1,000 million yen for trial in addition to the companies with a capital of 1,000 million yen or more investigated till the previous fiscal year.

2. Survey method

(1) Companies with a capital of 1,000 million yen or more

1) Contracts surveyed: New technology export agreements concluded in one year from April 1, 1994 to March 31, 1995

2) Companies surveyed: Companies in Japan with a capital of 1,000 million yen or more which conduct R&D activities or have relation with technology trade (1569 companies)

3) Method: A questionnaire was mailed directly to the manager of intellectual property division or R&D management division of each company.

4) Period: February 6, 1996 (sent) to February 26, 1996 (closed)

5) Collection: 900 companies answered (collection rate 57.4%).

(2) Companies with a capital of less than 1,000 million yen

One thousand five hundred and sixty five (1569) companies with a capital of 100 million yen to less than 1,000 million yen were asked by telephone whether they export any technology, and a questionnaire was mailed to companies who might export any technology newly in FY 1994.

Number of companies who responded to the telephone question: 1435

Number of companies to which the questionnaire was mailed: 288

Number of companies who answered to the questionnaire: 222

3. Survey Results

(1) Trends in technology exports (of the companies with a capital of 1,000 million or more) from Japan in FY 1994

As trends of technology exports from Japan in FY 1994, the following four major points can be indicated.

1) Number of technology export cases

- The number of technology export cases was 712 in FY 1992, 626 in FY 1993 and 730 in FY 1994, to show that the number of technology export cases which decreased in FY 1993 increased greatly in FY 1994. (See Table 1.)

2) Destinations (countries and areas)

- Among the regions of destinations, Asia accounted for 61.8%, North America, 18.6%, Europe 15.9%, and others, 3.7%. The Share of Asia increased for two consecutive years, and was more than 60% this fiscal year. (See Fig. 1.)

Table 1 Changes in the number of technology export cases found in the present survey and Management and Coordination Agency Statistics

	Present survey				Management and Coordination Agency Statistics			
	All companies		Companies answering for three consecutive years		Total of new and continuous cases		Only new cases	
	Cases	Ratio to previous year	Cases	Ratio to previous year	Cases	Ratio to previous year	Cases	Ratio to previous year
FY 1991	-	-	-	-	8,063	12.6%	2,066	+31.6%
FY 1992	712	-	462	-	8,201	1.7%	1,983	-4.0%
FY 1993	626	-12.1%	398	-13.9%	8,338	1.7%	1,896	-4.4%
FY1994	730	+16.6%	463	+16.3%	9,099	9.1%	2,148	+13.3%

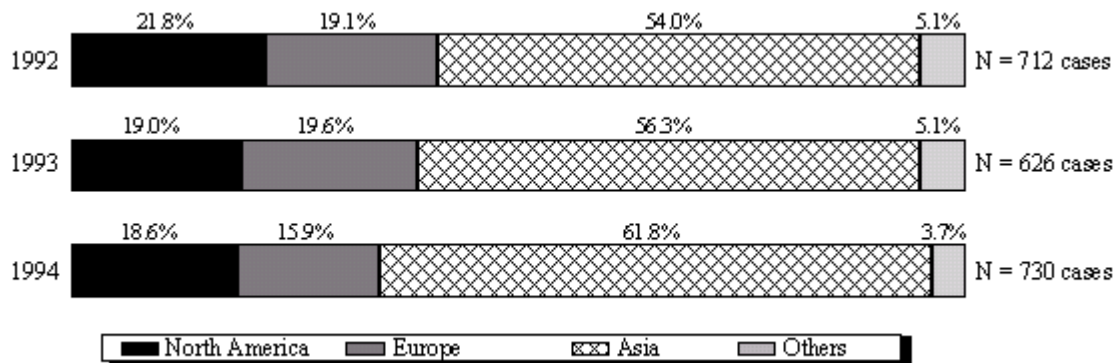


Fig. 1 Home regions of technology export partners

- Among respective countries and other economic entities, USA accounted for 16.7%, showing the largest percentage, being followed by Korea (13.8%), China (13.8%), Taiwan (10.0%) and Thailand (6.7%) in this order. The top five countries/areas included four countries/areas in Asia. In the changes for 3 years, the increase in the percentage of China was remarkable (7.9% in FY 1992 to 13.8% in FY 1994). (See Table 2.)

Table 2 High ranking countries/Areas of technology exports

	FY 1992			FY 1993			FY 1994		
	Country	Cases	Per-centage	Country	Cases	Per-centage	Country	Cases	Per-centage
1	USA	142	19.9%	Korea	104	16.6%	USA	122	16.7%
2	Korea	98	13.8%	USA	100	16.0%	Korea	101	13.8%
3	China	56	7.9%	China	80	12.8%	China	101	13.8%
4	Taiwan	53	7.4%	Taiwan	52	8.3%	Taiwan	73	10.0%
5	Thailand	51	7.2%	Thailand	32	5.1%	Thailand	49	6.7%
6	UK	35	4.9%	UK	29	4.6%	Germany	28	3.8%
7	Malaysia	34	4.8%	Germany	26	4.2%	Malaysia	26	3.6%
8	Germany	24	3.4%	Indonesia	19	3.0%	Indonesia	24	3.3%
9	Indonesia	23	3.2%	India	18	2.9%	India	23	3.2%
10	India	20	2.8%	France	15	2.4%	UK	15	2.1%
	Others	176	24.7%	Others	151	24.1%	Italy	15	2.1%
	Others			Others			Others	153	21.0%
	Total	712	100.0%	Total	626	100.0%	Total	730	100.0%

### 3) Technological fields of exported technologies

- Among respective technological fields, "machinery" area accounted for 28.4%, "electricity" area, 24.0%, "chemistry" area 21.6%, "metal" area 14.5% and "others" area, 11.5% in this order. The percentage of "electricity" which was about 30% (29.2%) in FY 1992 decreased for two consecutive years, while the percentage of "machinery" area increased greatly compared to the previous fiscal year, being the largest technology export area of FY 1994. (See Fig. 2.)

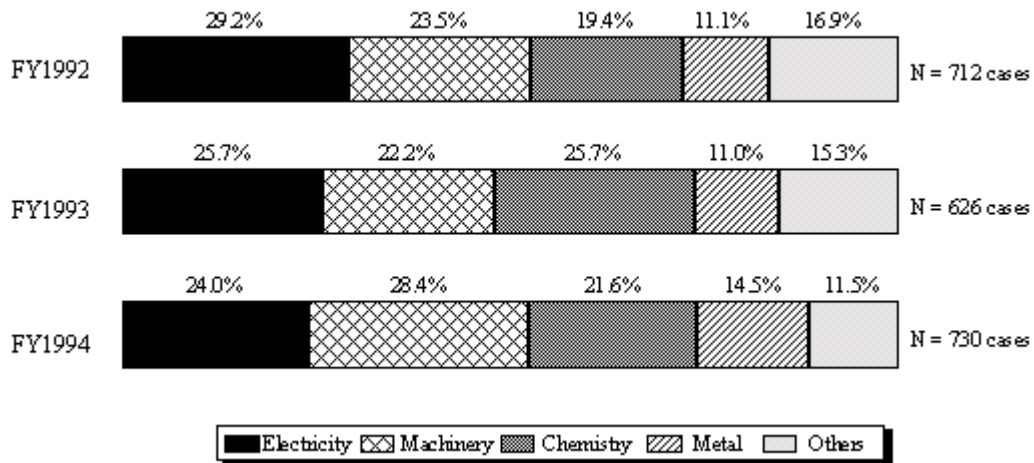


Fig. 2 Home regions of technology export agreement partners

- Among respective technological categories, the number of cases relating to "transportation equipment" was largest for three consecutive years, and especially this fiscal year, it greatly increased to account for 15.1% of all agreements, compared to the previous fiscal year (10.4%). (See Table 3.)

Table 3 Top ten technological categories of exported technologies

	FY 1992			FY 1993			FY 1994		
	Technological category	Cases	Per-centage	Technological category	Cases	Per-centage	Technological category	Cases	Per-centage
1	Transportation equipment	99	13.9%	Transportation equipment	65	10.4%	Transportation equipment	110	15.1%
2	Electronic	47	6.6%	Drugs and medicines	50	8.0%	Computers	57	7.8%
3	Computers	45	6.3%	Oils and paints	41	6.5%	Iron and steel	45	6.2%
4	Drugs and medicines	42	5.9%	Electronic	39	6.2%	Organic chemicals	44	6.0%
5	Fabricated metal products	33	4.6%	Computers	38	6.1%	Electronic	40	5.5%
6	Home appliances	32	4.5%	Fabricated metal products	34	5.4%	Fabricated metal products	33	4.5%
7	Organic chemicals	28	3.9%	Home appliances	30	4.8%	Drugs and medicines	30	4.1%
8	Ceramics	26	3.7%	Organic chemicals	29	4.6%	Other chemical products	28	3.8%
9	Oils and paints	26	3.7%	Communication equipment	23	3.7%	Non-ferrous metals	28	3.8%
10	TV and acoustic products	25	3.5%	Ceramics	22	3.5%	Oils and paints	27	3.7%
	Others	309	43.4%	Others	255	40.7%	Others	288	39.5%
	Total	712	100.0%	Total	626	100.0%	Total	730	100.0%

4) Changes in the number of technology export cases with or without shareholding relationship

For the changes in the number of technology export cases with or without shareholding relationship, the number of export cases to the companies without shareholding relationship changed little, while the number of export cases to the companies with shareholding relationship greatly changed year by year (249 cases in FY 1992, 195 cases in FY 1993, 297 cases in FY 1994). (See Table 4.)

Table 4 Changes in the number of technology export cases with or without shareholding relationship

	Without shareholding relationship		With shareholding relationship		All cases	
	Cases	Ratio to previous year	Cases	Ratio to previous year	Cases	Ratio to previous year
FY 1992	461	-	249	-	712	-
FY 1993	431	-6.5%	195	-21.7%	626	-12.1%
FY 1994	431	0.0%	297	+52.3%	730	+16.6%

The amount of direct overseas investment by the manufacturing industry which has close relation with technology exports to the companies with shareholding relationship tended to decrease till FY 1992 but increased from FY 1993, increasing as much as 23.8% in FY 1994 compared to the previous fiscal year. After FY 1994, the yen became strong to the level of ¥100 per dollar. So, it can be considered that the transfer of manufacturing bases to overseas progressed, and the technologies necessary for it were exported in a large volume. (See Table 5.)

Table 5 Changes in the amount of direct overseas investment by Japan (statistics based on the notifications to the Ministry of Finance, in one million dollars)

	Total		Manufacturing in dustry		Non-manufacturing in dustry	
	Amount	Ratio to previousyear	Amount	Ratio to previousyear	Amount	Ratio to previousyear
FY 1991	41,584	-26.9%	12,311	-20.5%	28,809	-29.1%
FY 1992	34,138	-17.9%	10,057	-18.3%	23,720	-17.7%
FY 1993	36,025	+5.5%	11,131	+10.7%	24,627	+3.8%
FY1994	41,051	+14.0%	13,783	+23.8%	26,877	+9.1%

Among the respective regions of export, the percentage of Asia increased year after year, and in FY 1994, it was more than 70% (73.7%). Also in the amount of direct overseas investment by the manufacturing industry, the percentage of Asia increased, and reached about 40% of the total amount in FY 1994. The Japanese manufacturing industry expanded the investment in Asia low in production cost and very attractive as an investment region, and as a result, it can be considered that also in the technology exports with shareholding relationship, the percentage of Asia increased. (See Fig. 3.)

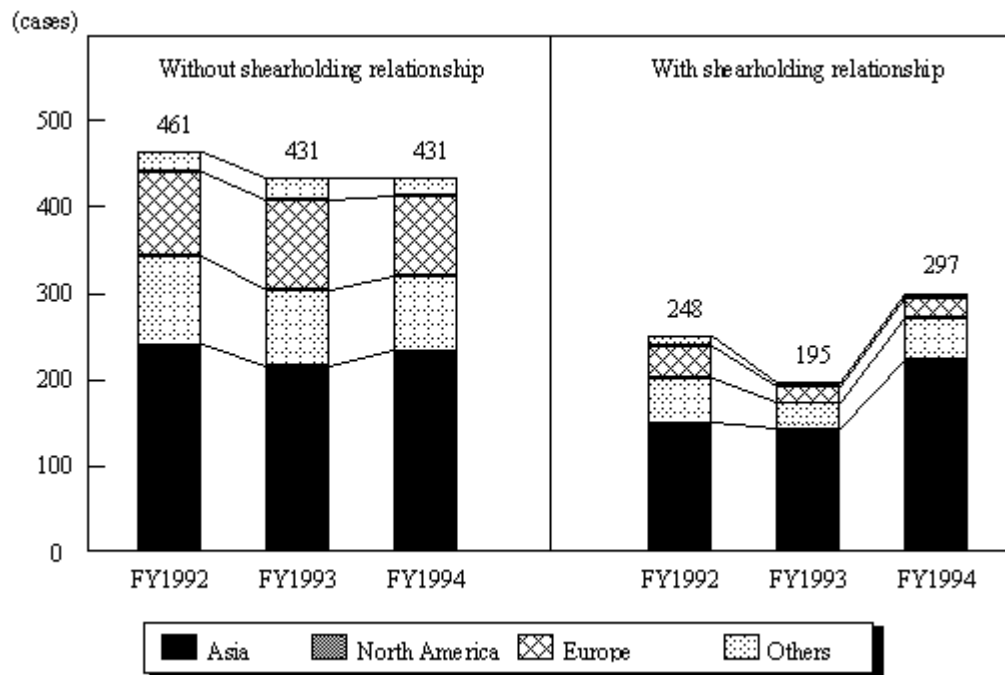


Fig. 3 Home regions of the other parties with or without shareholding relationship

(2) Overall trends in technology exports

1) Agreement term

- "5 years to less than 10 years" accounted for 34.4%, and "1 year to less than 5 years", 29.5%.
- Among the respective regions, Asia was lower in the percentage of "till period of industrial property, etc.", and high in the percentage of "5 years to less than 10 years" than Europe and America.

2) Agreement form

- Onerous agreement accounted for 85.5%, gratuitous agreement, 8.9% and cross-

license agreement, 5.7%.

- Of the cross-license agreement, "counter value receiving contract" accounted for 51.5%, "equivalent exchange agreement", 36.8% and "counter value paying agreement", 11.8%. Among the respective regions, North America was high in the percentage of "counter value paying agreement", and among respective technological categories, "electricity" area, particularly the category of semiconductor products was high in said percentage.

### 3) Counter value receiving methods

- "With initial payment" accounted for 55.5%, and "with running royalty", 76.8%.
- In the exports to the companies with shareholding relationship, the percentage of "with initial payment" was high, and in the exports to the companies without shareholding relationship, the percentage of "with running royalty" was high.

### 4) Exclusive right and re-licensing right

- "With exclusive right" accounted for 34.3%, and "with re-licensing right", 8.8%.
- Among the respective regions, North America was low in "with exclusive right" and high in "re-licensing right".

### 5) Types of technologies

- "With patent" accounted for 41.9%, "with knowhow", 88.5%, and "with trade mark", 19.8%.

Among the respective regions, Asia was lower in the percentage of "with patent" and higher in the percentage of "with knowhow" than Europe and America.

### (3) Technology exports of companies with a capital of less than 1,000 million yen

Since the survey method for the companies with a capital of less than 1,000 million yen was different from that for the companies with a capital of 1,000 million yen or more, simple comparison cannot be made. Among 1369 companies with a capital of less than 1,000 million yen which extended cooperation for the present survey, 44 companies answered to newly export technologies, showing that the percentage of the companies exporting technologies was lower than that of the companies with a capital of 1,000 million yen or more. (See Fig. 4.)

Among the respective regions, Asia was as high as about 80% (79.5%), and also with regard to the contents of contracts, the percentage of the contracts short in period, and the percentage of the contracts with initial payment were high, showing a different tendency. The reasons are considered to be that these companies are different in capital and in exported technologies from the companies with a capital of 1,000 million yen or more.

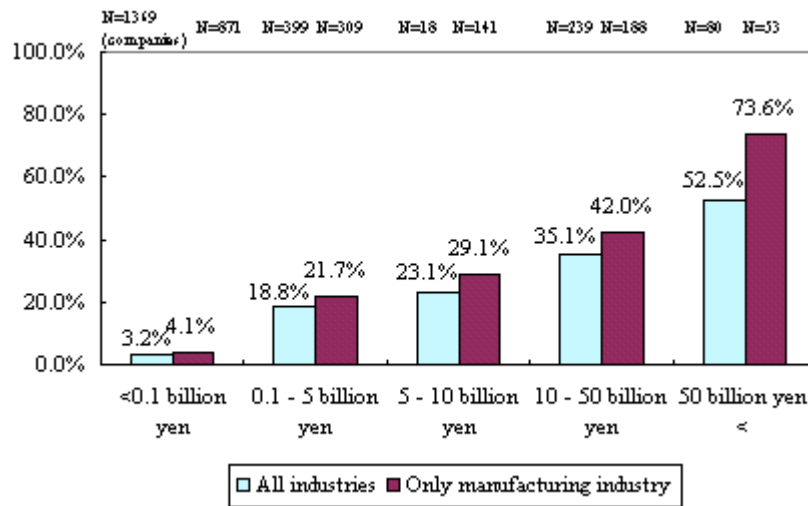


Fig. 4 Percentages of companies with technology export contracts by capital scale