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Analysis of Trends in Imports of Foreign Technology to Japan

Status of technology and technology related imports based on the Foreign Exchange
and Foreign Trade Control Law (including software and trademarks)

— 1994 Fiscal Year —

November 1996

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Translation from
Japanese version

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Summary

1. Introduction

This survey summarizes the record of foreign technology imports to Japan in fiscal 1994 and analyzes recent trends in the introduction of such technology.

This report consists of three sections: Part 1 "Analysis of Trends in Imports of Foreign Technology to Japan," Part 2 "Analysis of Trends by Technology Format," and Part 3 "Statistical Tables." Part 1, "Analysis of Trends in Imports of Foreign Technology to Japan," presents an analysis of by classification of technology as well as characteristics such as region, country of origin, and contract conditions. Part 2, "Analysis of Trends by Technology Format," classifies technology imports into three categories for analysis: "software," which accounts for some 50 percent of all cases of technology imports, "trademark only," which differs in character from other types of technology, and "hardware technology," which consists primarily of hardware that does not fall into the other two categories. Part 3, "Statistical Tables," presents a variety of statistical data.

The collection and analysis of data on technology imports rely on the "Report of the Conclusion (Revision) of a Technology Import Contract" and "Notification of the Conclusion (Revision) of a Technology Import Contract" (abbreviated below as "report, etc."), which are based on the "Foreign Exchange and Foreign Trade Control Law" (abbreviated below as "Foreign Exchange Law."

2. Principal Survey Results

- 1) The number of new cases of technology imports in fiscal 1994 was 3,161, which is a 4 percent increase (132 cases) over the previous year. There has been little change in this rate of increase over the past several years, and technology imports continue to grow at this level.

The number of cases of technology imports broken down by technology format (hardware technology, software, trademark only) was as follows: 1,629 cases for "software," accounting for approximately 52 percent of the total. Over the past five years, the software category has accounted for approximately 50 percent of all cases of technology imports. In contrast, "hardware technology" accounted for 1,117 cases or 35 percent of the total, and the share accounted for by this category has been declining each year since fiscal 1991. Case of "trademark only" increased for the second year in a row.

- 2) When broken down by country of origin, the figures were as follows: there were 2,056 cases of technology imports from the United States, accounting for two-thirds of the total and indicating a certain polarization. Britain was second, accounting for only 9 percent of the total (283 cases). Next, in order, came France, Germany, and Holland. With the exception of France and Germany, technology imports from all countries of origin grew compared with the previous year.

In all technology format categories, imports from the United States were the most numerous. In the "hardware technology" and "software" categories, imports from the United States accounted for between 60 and 70 percent of the total. In the "trademark only" category, Britain led by a narrow margin, accounting for 62 percent of the total together with the United States.

Among countries other than the United States, Britain maintained a constant share in each technology format category. The shares of Germany and Holland were comparatively large in "hardware technology," as was that of France in the "trademark only" category. technology imports from the Asian region are growing quickly, especially in the "software" category.

- 3) When broken down by Technology Classification (specific classification entry), "electronic computers" accounted for 1,740, or 55 percent of the total (a 3-percent increase over the preceding year). This marked a continuation of the leading position occupied by the classification entry of "electronic computers". This was followed by "outer garment," "electronic parts and devices," "medical supplies," and "precision instruments," in that order.

Within specific technology format categories, "hardware technology" was lead by the classification entry of "electronic parts and devices," with 117 cases (10 percent of the hardware technology total). This was followed by "electronic computers" and "medical supplies." Most of the "software" category was accounted for by the classification entry of "electronic computers". It can be said that the domination of technology imports overall by the "electronic computers" classification entry is due to the domination by the "software" category. In the "trademark only" category, all of such classification entries as "outerwear," "textiles," and "other clothing and textile products" had large shares. Also, in the non-textile classification entries, "precision instruments" and "electronic computers" had substantial shares in the "trademark only" category.

- 4) The breakdown by technology type (knowhow, patents, trademarks) (some cases include more than one technology type) was as follows

"Knowhow": 77.5% of total cases

"Patents" (including new application proposals and design): 22.0% of total cases

"Trademarks": 30.0% of total cases

The reason for the dominance of "knowhow" is that almost all imports in the "software" category fall under this type. Also, "trademarks" cases increased by 34 percent in fiscal 1994, the third consecutive year of growth.

In the "hardware technology" category, "knowhow" cases declined more than "patents." The "software" category was accounted for almost entirely by "knowhow" cases, but in recent years there has been an increase in contracts related to imports of "patents" and "trademarks."

- 5) Broken down by payment conditions, contracts involving an initial payment, such as "initial payment only" agreements, declined from the preceding year's total of 1,934 to 1,852 cases, making this the second year in a row such a decrease occurred. In contrast, contracts with no initial payment increased slightly, from 902 to 1,156 cases.

The share of "initial payment only" contracts in the "software" category remained high. Also, "running royalty only" contracts (including those with minimum conditions) are on the increase in the "software" category. Most of the contracts in the "trademark only" category involve "running royalties".

An examination of running royalty rates indicates that contracts involving non-percentage based "other" rates (e.g., a unit price per item, etc.) were the most numerous at 57 percent of the total. (This is a 41-percent increase over the previous year.) This is largely due to the fact that "other" rates are extremely common in the "software" category (80 percent in that category).

- 6) A breakdown by term of contract shows that "one year or more but less than five years" accounts for 36.8 percent of the total. This is due to the 44-percent share of the "software" category for "one year or more but less than five years" contracts.

- 7) Examining foreign technology imports by different types of businesses based on size of capital reveals that, overall, areas where the size of capital is large tend to have many cases of technology imports. However, even areas where the size of capital is comparatively small account for a proportionally larger share of cases of technology imports: for example, 420 cases for companies capitalized at less than 50 million yen and 408 cases for companies capitalized at 100 or million yen or more but less than 500 million yen

Broken down by technology format, there was a high ratio of cases of technology imports in the "hardware technology" category among enterprises and manufacturers with a large size of capital. There were many imports by companies in such industry as "communications, electronics, and electrical measuring equipment industry," the "electrical machinery, equipment and supplies industry," and the "general machinery industry". The import ratio for the "software" category was high among manufacturers with a large size of capital, but among non-manufacturing companies there were a comparatively large number of enterprises with a small size of capital. Among manufacturers, companies in the "communications, electronics, and electrical measuring equipment industry," the "electrical machinery, equipment and supplies industry," etc., were well represented, while among non-manufacturing companies, companies in the "information services and surveys industry," the "machinery and tools wholesaling industry," and the "miscellaneous products wholesaling industry" were the most numerous. There were many enterprises with a comparatively small size of capital represented among importers in the "trademark only" category, and the number of such importers in non-manufacturing fields was also large. The most well represented type of business was the "textiles industry."

- 8) With regard to the technology trade balance, the value of payments increased by 18 percent (to \$1,288 million) over the previous year, while the value of receipts increased by 35 percent (to \$1,431 million) over the previous year. This caused a substantial increase, from 0.55 to 0.64, in the technology trade balance ratio (receipts/payments) from the preceding year's level.

According to the "1995 Report on the Survey of Research and Development" published by the Management and Coordination Agency, the technology trade balance ratio for fiscal 1994 was 1.25. This figure diverges significantly from the ratio according to "International Trade Balance Statistics," published by the Bank of Japan, which form the basis of this report. A quantitative analysis and calculations based on the primary factors behind this discrepancy between the two sets of statistics allow us to estimate the trade balance ratio for fiscal 1994 at 0.85 (and 0.7 for fiscal 1993).

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Part 1 Analysis of Trends in Imports of Foreign Technology to Japan

1.1 Number of Technology Import Contracts, Etc.

- 3161 New Technology Import Contracts, 4.4% Increase over Previous Year, 130% of Figure for 10 Years Earlier

The number of new contracts involving imports of technology (referred to below as "technology import cases") in fiscal 1994 was 3161. This was 132 more (4.4 percent) than the total for the previous fiscal year.

An examination of the trend in the number of technology import cases over the past 10 years (Table 1 and Figure 1) shows that, though there was a dip in 1986, there was a subsequent increase in fiscal 1987 of 14.7 percent over the previous year, and in fiscal 1990 the rate of increase again topped 10 percent for the first time in two years.

From fiscal 1990 onward there has been a steady increase each year, and this fiscal year (1994) marks a return to approximately the level of three years before. As a result, the number of import cases was 110 percent that of five years before, and 130 percent that of 10 years before.

Also, as shown in Statistical Table 3-5 in Part 3, 415 of the technology import contracts fall into the "trademark only" category (a 12.5 percent increase over the previous fiscal year). If these cases are omitted, since they do not involve any technological matters such as knowhow, patents, etc., the number of technology import contracts becomes 2,746. This is an increase of 86 (3.2 percent) over the previous year.

- 185 Revised Contracts Involving the Addition of Technology, 9.8% Less than Previous Year

The number of revised contracts was 1,357, which is 37 (2.8 percent) more than the total for the previous fiscal year. If these, there were 185 revised contracts involving the addition of technology, which is a decrease of 20 (9.8 percent) from the total for the previous fiscal year. Revised contracts involving the addition of technology accounted for 13.6 percent (15.5 percent the previous fiscal year) of all revised contracts. (See Part 3, Statistical Table 3-11.)

- 45 Cases Involving Technology Requiring Notification, 1.4% of Total

The number of contracts involving technology for which prior notification is required under the Foreign Exchange Law (see table on following page) was 45, which is 1.4 percent of the total. (See Part 3, Statistical Table 3-9.)

- 73 Cases of New Trademark Import Contracts Due to the Cancellation of Previous Contracts

There is a special circumstance this fiscal year: all previously concluded contracts involving textiles related trademarks imported from Britain were to become invalid at the end of April 1995. As of March 1995, new contracts for the import of the affected trademarks numbered 45 for the "textiles" classification, 27 for "outerwear," and one for "other clothing and textile products."

- Adjustments Due to Revision of JIS Categories

In October of 1993, the Standard Industrial Classification for Japan underwent their tenth revision, and they apply to fiscal 1994 onward. As a result, there are some minor changes in the correspondence between the Technology Classification and the new Standard Industrial Classification for Japan, and the previous classification entry "electronic and communications parts" has been changed to "electronic parts and devices."

Also, the classification codes for the various industrial Classification entries have been changed, and the classifying for various enterprises have been reexamined, in the calculation of totals for each Industrial Classification entry. For this reason, there have been large changes in the figures for certain specific entries.

Table Paperwork Such as Notification of Technology Importation

Division		Type of notification or report	
Type	Technology field	Payment	
		More than 100 million yen	100 million yen or less
New contracts	Designated technologies 1 Aircraft 2 Weapons 3 Explosives 4 Nuclear power 5 Space development	Notification	Report
	Technology other than the above	Notification	Report
Revised contracts	Cases involving the importation of a new designated technology	Notification	Report
	Cases not involving the importation of a new designated technology	Notification	Report
	Status continuation (cases involving no change in contract)	Notification	Report

Notification: Notification is required in cases of new or revised contracts involving a designated technology such as "aircraft" and where the amount of payment for the technology import exceeds 100 million yen over one year. The notification shall be made in advance of the conclusion of the import contract.

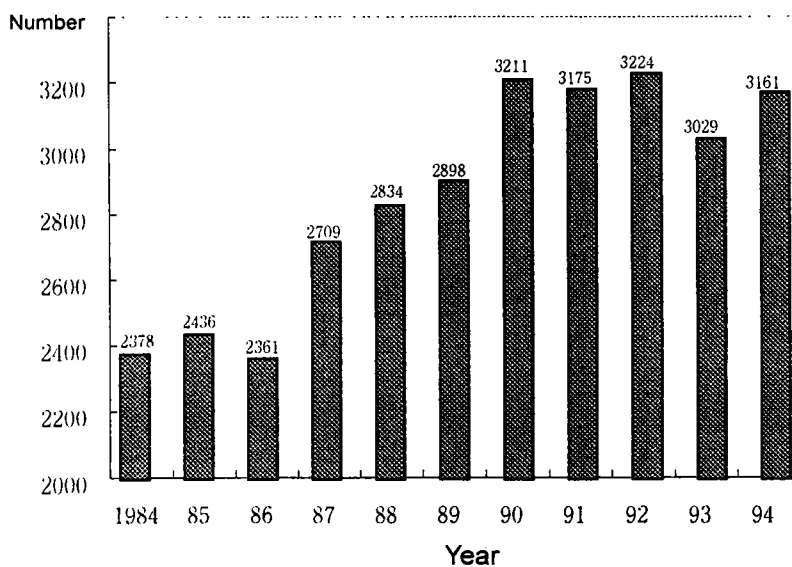
Report: A report is required in cases other than the above. The report shall be made after the conclusion of the import contract.

Table 1 Trend in Number of Technology Import Contracts

Fiscal year	Technology import cases (A)	Comparison with previous year (%)	Reference		
			Actual extension (B)	Technology addition (C)	Actual technology imports (A - B + C)
1984	2 3 7 8	7. 5	1 4 4	1 7 7	2 4 1 1
85	2 4 3 6	2. 4	1 3 5	2 2 5	2 5 2 6
86	2 3 6 1	- 3. 1	1 1 2	2 1 8	2 4 6 7
87	2 7 0 9	1 4. 7	1 2 6	2 2 4	2 8 0 7
88	2 8 3 4	4. 6	8 4	2 6 3	3 0 1 3
89	2 8 9 8	2. 3	5 0	2 3 5	3 0 8 3
90	3 2 1 1	1 0. 8	7 4	3 2 4	3 4 6 1
	3 1 7 5	- 1. 1	旧法分 7 3	2 6 4	3 3 6 6
Fiscal year	Technology import cases (A)	Comparison with previous year (%)	Actual extension (B)	Technology addition (C)	Actual technology imports (A + C)
1992	3 2 2 4	1. 5	—	2 1 2	* 3 4 3 6
93	3 0 2 9	- 6. 0	—	2 0 5	3 2 3 4
94	3 1 6 1	4. 4	—	1 8 5	3 3 4 6

Note: The figure for "actual technology imports" is obtained by subtracting from the number of import cases the number of new contracts actually involving the extension of an earlier contract, and by adding the number of revised contracts involving the addition of new technology. However, it is no longer possible to determine which cases actually involve the extension of an earlier contract, due to revisions in the law. For this reason, column B is not relevant for the figures for fiscal 1992 onward.

Figure 1 Trend in Number of Technology Import Contracts



1.2 Import Status by Technology Classification

- "Manufacturing" Is 98.4% of Total.

This survey report is the result of calculations and analysis using the "Technology Classification" created for that purpose by the Science and Technology Agency, based on the "Standard Industrial Classification for Japan" of the Management and Coordination Agency. (See Table B in Part 3 for the correspondence between the Technology Classification and the Industrial Classification.)

Based on this, of the new technology import contracts in fiscal 1994, there were 3,112 (4.0 percent increase over previous fiscal year) that deal with technology that falls into the entry of "manufacturing." This accounts for 98.4 percent of the total. Entries other than manufacturing (agriculture, forestry, and fisheries, mining, construction, other industries) accounted for a mere 49 cases, or 1.6 percent of the total.

(Table 2)

(See section 1.9 for the Industrial Classification of importing enterprises based on the Standard Industrial Classification for Japan.)

- "Electrical Machinery, Equipment and Supplies" Increased 3.4% to 66.2% of Total.

A breakdown of the types of technology included in "manufacturing" reveals that there were 2,092 cases of imports related to "electrical machinery, equipment and supplies," which accounts for 66.2 percent (66.8 percent in fiscal 1983) of all technology imports. Next, among the top five imported technology types came "general machinery and tools," "clothing and textile products," "chemicals," and "precision instruments." The top four types are unchanged from previous years, but number five, "precision instruments," is a new entry into the top five in 1994.

Together, these top five technology types accounted for 88.0 percent (87.2 percent in fiscal 1983).

When compared with the previous year's levels, all of the top five types recorded increases. And in terms of share of the total, only "electrical machinery, equipment and supplies" showed a slight drop. (See Part 3, Statistical Table 3-2.)

Also, compared with technology imports in fiscal 1984 (10 years previous) and fiscal 1989 (five years previous), the total for "electrical machinery, equipment and supplies" was 2.6 times the former and 1.3 times the latter, and "precision instruments" was 1.3 times the former and 1.4 times the latter. In addition, "clothing and textile products" increased to 1.1 times the level of five years previous. The other two types both showed a drop.

Table 2 Trend in Number of Technology Import Cases

Technology Classification	Fiscal 1994	Share	Compared with previous year	Fiscal 1993	Fiscal 1989	Fiscal 1984
Manufacturing	3 1 1 2	98.4	4.0	2993	2848	2313
Clothing and textile products	1 9 3	6.1	27.8	151	182	230
Chemicals	1 7 5	5.5	6.7	164	228	179
General machinery and tools	2 3 1	7.3	4.5	221	283	371
Transport equipment	3 3	1.0	-38.9	54	105	87
Precision instruments	9 0	2.8	30.4	69	63	68
Electrical machinery, equipment and supplies	2 0 9 2	66.2	3.4	2023	1604	817
Other products	8 3	2.6	2.5	81	134	148
Other (Note)	2 1 5	6.8	-6.5	230	249	413
Non-manufacturing	4 9	1.6	36.1	36	50	65
Total	3 1 6 1	100	4.4	3029	2898	2378

Refer to Part 3, Statistical Table 3-2 for details.

Note: As used here, the term "other" is not a classification entry, but rather the result of subtracting the figures of the seven above technology classification entries from the total for "Manufacturing".

- "Electronic Computers" Increased 3.4% to 55.0% of Total, 300% of Figure 10 Years Previous.

A more detailed breakdown of imported technologies shows (Table 3) that the technology accounting for the most import cases is "electronic computers," with 1,740 cases or 55.0 percent (55.6 percent in fiscal 1983) of the total for technology imports. Next come "outer garment," "electronic parts and devices," "medical supplies," and "precision instruments," in that order. As shown in Figure 2, the imported technologies are overwhelmingly those related to "electronic computers."

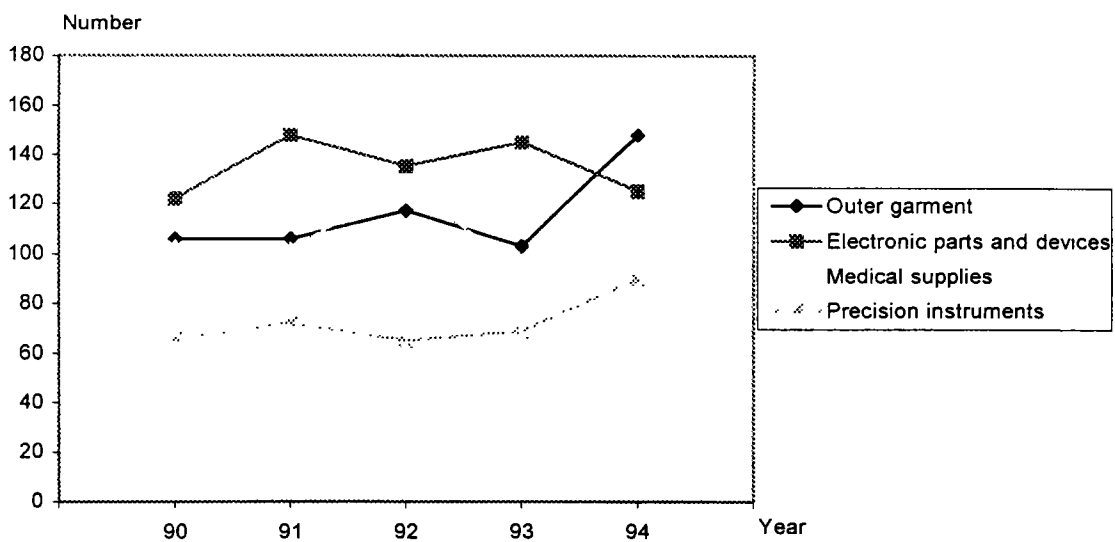
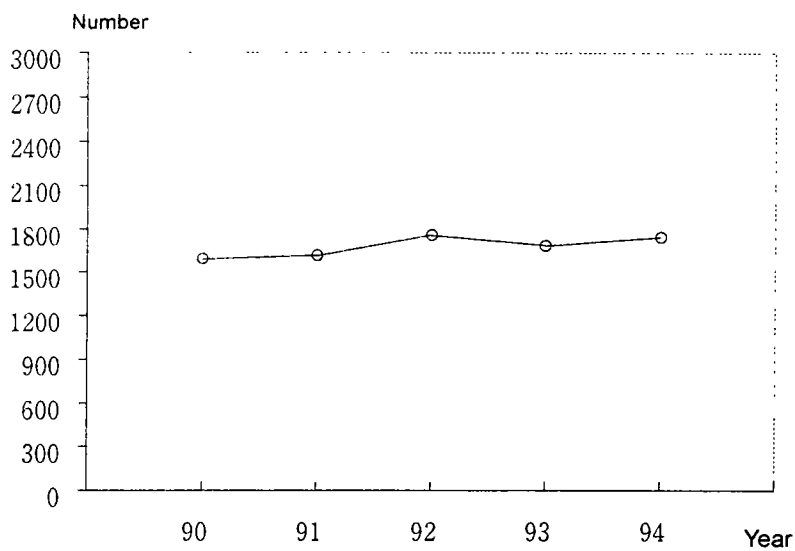
A comparison of the top five with the figures for the preceding year shows increases for all, with the exception of "electronic parts and devices."

Next, a comparison with the figures for five (fiscal 1989) and 10 (fiscal 1984) years ago shows that "electronic computers" was 140 percent the figure for five years previous and 300 percent the figure for 10 years previous. "Electronic parts and devices," was 120 percent the figure for five years previous and 160 percent the figure for 10 years previous. "Precision instruments" was 140 percent the figure for five years previous and 130 percent the figure for 10 years previous. The remaining two categories both declined from the levels for both five and 10 years previous.

Table 3 Trend in Number of Import Cases for Top Five Technology Classification Entries (Bottom Level)

Technology Classification Entry (bottom level)	Fiscal 1994	Share	Compared with previous year	Fiscal 1993	Fiscal 1989	Fiscal 1984
Electronic computers	1 7 4 0	55.0	3.4	1683	1268	587
Outer garment	1 4 8	4.7	43.7	103	117	158
Electronic parts and devices	1 2 5	4.0	-13.8	145	106	76
Medical supplies	9 5	3.0	1.1	94	121	65
Precision instruments	9 0	2.8	30.4	69	63	68

Figure 2 Number of Import Cases by Major Technology Classification Entry



1.3 Import Status by Region and Country of Origin

(1) Import Status by Region of Origin

- 2,125 Cases of Imports from North America, a 2.1% Increase; Imports from Europe Also Increased.

A breakdown by region of origin of new technology import contracts in fiscal 1994 indicates 2,125 cases of imports from North America, which is 67.2 percent of the total. It is followed by Europe, with 883 cases (27.9 percent of the total), Asia, with 126 cases (4.0 percent of the total), the Pacific region, with 17 cases (0.5 percent of the total), the former Soviet Union, with six cases (of which Russia accounted for all six), and South America with four cases.

In comparison with the previous year's figures, North America increased by 2.1 percent, Europe by 7.4 percent, and Asia by 32.6 percent. The case of Asia is notable because the percentage of increase was in the two figures. (See Part 3, Statistical Table 3-3.)

(2) Import Status by Country of Origin

- 2,056 Cases of Imports from the U.S.A., 65.0% of Total, an Increase to 150% of the Level 10 Years Previous

A breakdown of import cases by country of origin (Table 4) shows that the U.S.A. is the leader, with 2,056 cases or 65.0 percent of the total (65.5 percent in fiscal 1983). It is followed by Britain, France, Germany, and Holland, in that order. The share of the top five countries combined is 85.7 percent of the total (85.2 percent in fiscal 1983).

In comparison with the previous year's figures, technology imports from the U.S.A., Britain, and Holland increased, while technology imports from France and Germany dropped.

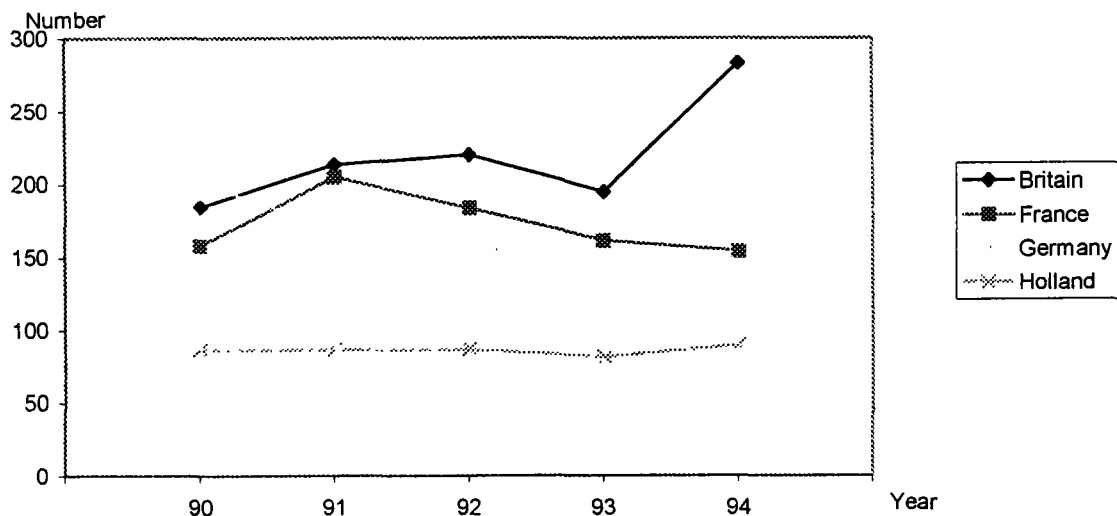
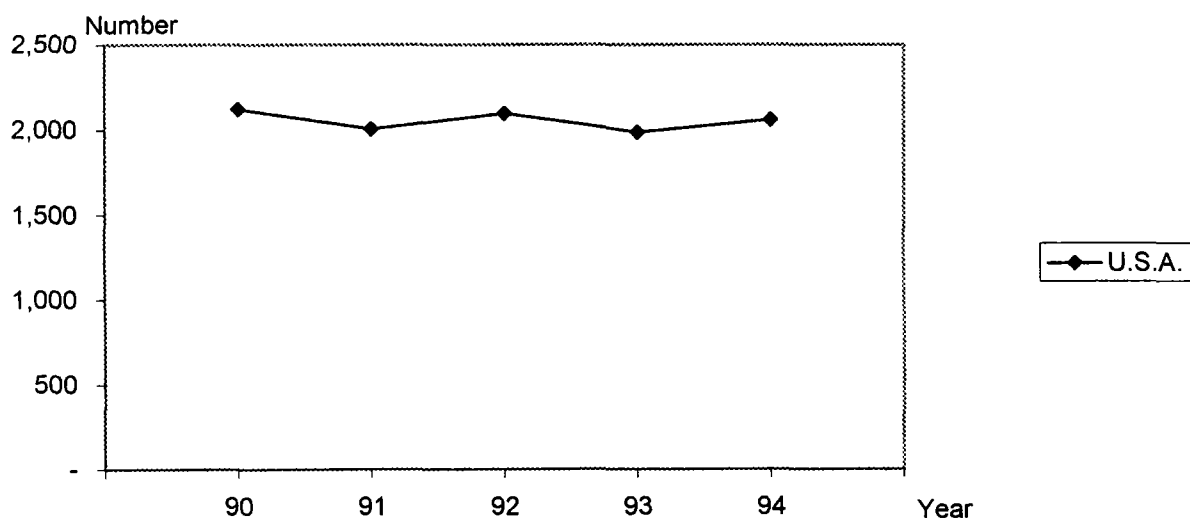
A comparison with the figures for five (fiscal 1989) and 10 (fiscal 1984) years ago shows that technology imports from the U.S.A. had increased to 110 percent of the level five years previous and to 150 percent of the level 10 years previous. Technology imports from Britain had increased to 140 percent of the level five years previous and to 180 percent of the level 10 years previous. Technology imports from Holland had increased to 110 percent of the level five years previous and to 190 percent of the level 10 years previous. On the other hand, both France and Germany showed a downward trend compared with their levels both five and 10 years before. Technology imports from the France had decreased to 82 percent of the level five years previous and to 64 percent of the level 10 years previous, and the corresponding figures for Germany were 65 percent of the level five years previous and to 55 percent of the level 10 years previous.

Table 4 Status of Technology Imports from Principal Countries of Origin

Country	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989	Fiscal 1984
U.S.A.	2 0 5 6	6 5 . 0	3 . 6	1 9 8 5	1 8 0 8	1 3 5 5
Britain	2 8 3	9 . 0	4 5 . 1	1 9 5	1 9 6	1 5 5
France	1 5 4	4 . 9	- 4 . 3	1 6 1	1 8 7	2 4 0
Germany	1 2 7	4 . 0	- 1 3 . 6	1 4 7	1 9 6	2 3 2
Holland	8 9	2 . 8	9 . 9	8 1	7 9	4 6

(Note) Figures for Germany include technology imports from the former East Germany previous to unification

Figure 3 Trend in Number of Import Cases from Principal Countries of Origin



- 1,327 Cases of Electronic Computer Imports from the U.S.A., 140% the Level Five Years Previous

A breakdown of technology imports from the top five source countries by Technology Classification indicates roughly the same trend in the rankings of the top classification entries (Table 5): "electrical machinery, equipment and supplies" and "general machinery and tools." There were some peculiarities among the top imported technologies. For example, the top entry for France was "clothing and textile products" and the second entry for Britain was "textiles "

In comparison with the figures for five years previous, the growth of imports related to "textiles" from Britain was the strongest, at 15.7 times the level in 1989. This was followed by "clothing and textile products" from Britain, at 240 percent the level five years previous, and "general machinery and tools" from Holland, 230 percent the level five years previous. However, except for "electrical machinery, equipment and supplies" and a few other classification entries, technology imports in most entries from most countries were on a downward trend. In particular, the top five entries from Germany all so a downward trend over the preceding five years.

Among the cases included in "electrical machinery, equipment and supplies," "electronic computer" related technology imports from the principal source countries (Table 6) were dominated overwhelmingly by the U.S.A., at 1,327 cases or 76.3 percent of all technology imports in the electronic computer entry. It was followed by Britain, Singapore, and Canada, in that order. Compared with the preceding year, the figure for Britain was up 24.2 percent and that for Singapore was up 20.9 percent. In contrast, the figure for Canada decreased 40.8 percent and that for Switzerland decreased 15.6 percent.

Compared with the figures for five years previous, the level for the U.S.A. remained dominant (77.4 percent in fiscal 1983), that for Switzerland increased to 190 percent of the 1983 level, Britain increased to 170 percent of the 1983 level, and Canada rose to 150 percent of the 1983 level. This indicates that imports in this area from countries other than the United States have been increasing in recent years.

Table 5 Rankings of Principal Import Technology Classification Entries by Source Country

	U.S.A	Britain	France	Germany	Holland
No 1	Electrical machinery, equipment and supplies 1579(1212)	Electrical machinery, equipment and supplies 135(82)	Clothing and textile products 47(58)	Electrical machinery, equipment and supplies 50(55)	Electrical machinery, equipment and supplies 49(34)
No 2	General machinery and tools 130(149)	Textiles 47(3)	Electrical machinery, equipment and supplies 25(31)	General machinery and tools 24(53)	General machinery and tools 16(7)
No 3	Chemicals 93(128)	Clothing and textile products 46(19)	Precision instruments 20(11)	Chemicals 19(24)	Other products 5(6)
No 4	Clothing and textile products 55(35)	Other products 10(11)	Chemicals 11(14)	Transport equipment 6(15)	Chemicals 4(9)
No. 5	Precision instruments 49(26)	Chemicals 9(20)	Tanned leather, leather goods, furs 11(13)	Other products 6(8)	Clothing and textile products 3(8)

Figures in parentheses are import cases in 1989.

Table 6 Number of Electronic Computer Import Cases by Country

Country	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
U.S.A.	1 3 2 7	7 6 . 3	4 . 6	1 2 6 9	9 8 2
Britain	1 1 8	6 . 8	2 4 . 2	9 5	7 1
Singapore	5 2	3 . 0	2 0 . 9	4 3	4 7
Canada	4 5	2 . 6	- 4 0 . 8	7 6	3 0
Switzerland	3 8	2 . 2	- 1 5 . 6	4 5	2 0
Total	1 7 4 0	1 0 0 . 0	3 . 4	1 6 8 3	1 2 6 8

- Technology Imports from Asia

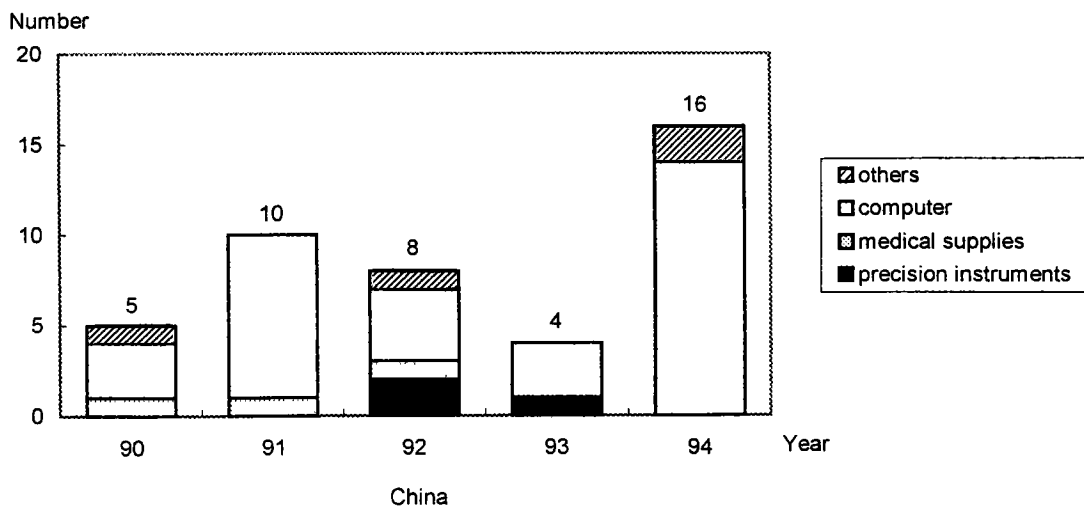
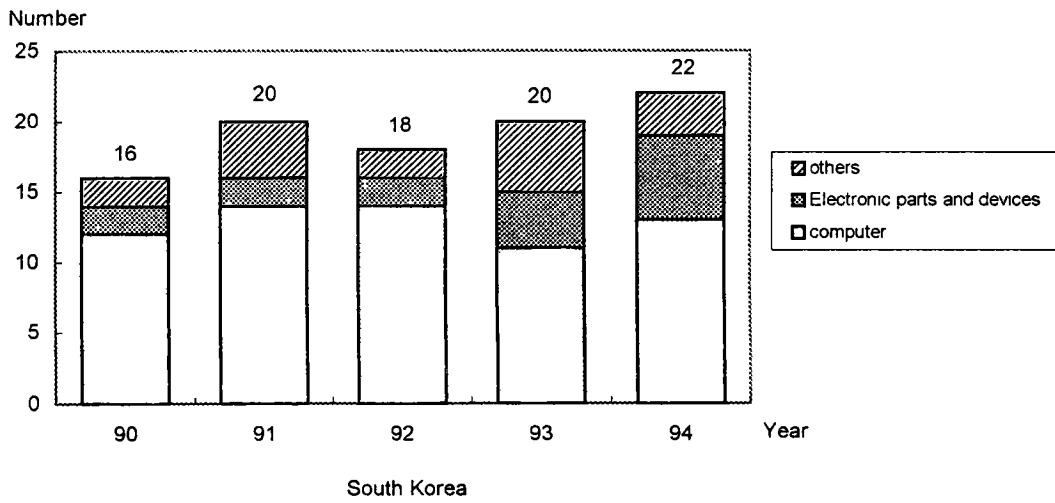
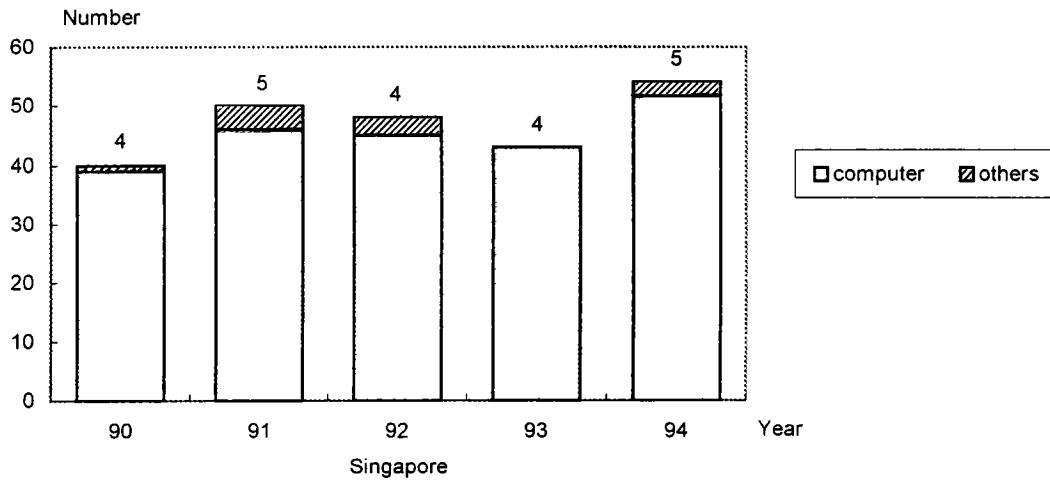
An examination of technology imports from Asia shows that Singapore, South Korea, and China are the leading source countries.

The special characteristics of technology imports from these three countries (Figure 4) include the fact that technology imports from Singapore consist almost entirely of those in the electronic computer entry. The combined number of such cases in fiscal 1994 and five years earlier is 225, while that for all other classification entries is only 10.

Next, in the case of South Korea, electronic computer related technology imports, at 64, made up more than half the total of 96 for the past five years. In other entries, "electronic parts and devices" stand out. Such imports have been at a constant rate for about five years, totaling 16 cases over that time.

Like the top two countries, of the 43 cases of technology imports from China over the previous five years, the majority -- 33 cases -- were electronic computer related.

Figure 4 Technology Imports from Asia



1.4 Import Status in Advanced Technology Fields

It is difficult to define advanced technology precisely, but we have focused on specific technology fields that have aroused a large amount of interest in recent years, such as electronic computers (hardware, software, services), semiconductors, nuclear power, aerospace, medical supplies, and biotechnology, and examined the import status of items including those technologies. In our examination of advanced technology, an analysis of trends in import contracts covering technology (knowhow, patents) was performed, and imports involving trademarks only were omitted.

Note that we reluctantly omitted items, such as robots and new materials, for which the technology scope could not be specified. (Figures for the number of cases include overlaps where multiple advanced technologies are included in a single case.)

- Concentration on Software, Which Accounts for 1,629 Cases and 51.5% of Total Cases, 3.1 Times the Level 10 Years Previous

An examination of the status of advanced technology imports in fiscal 1994 (Table 7) shows that "software," with 1,629 cases, accounted for 51.5 percent of all new technology import contracts. This was followed by "semiconductors," "nuclear power," and so on. This shows that among current technology imports, software technology is being applied in many technological fields and large volumes of software are being imported by software houses and trading companies. Another reason for the increase in software imports is that special import formats different from those used for other technologies are being used.

Among the top five advanced technology imports, the only category that showed a drop compared with the previous year was "hardware," which was down 11.0 percent. All the others increased, with the biggest gain being posted by "semiconductors," with 19.9 percent.

A comparison of the number of import cases with fiscal 1984 (10 years previous) and fiscal 1989 (five years previous) indicates that the biggest increases were in the "software" category, which grew to 3.1 times the figure for 10 years previous and 1.3 times that for five years previous.

Turning to other categories, "nuclear power" increased to 190 percent of the level 10 years previous and was 100 percent of the level five years previous. "Semiconductors" increased to 210 percent of the level 10 years previous and was 72 percent of the level five years previous. "Medical supplies" increased to 140 percent of the level 10 years previous and was 78 percent of the level five years previous. "Hardware" decreased to 92 percent of the level 20 years previous and was 86 percent of the level five years previous.

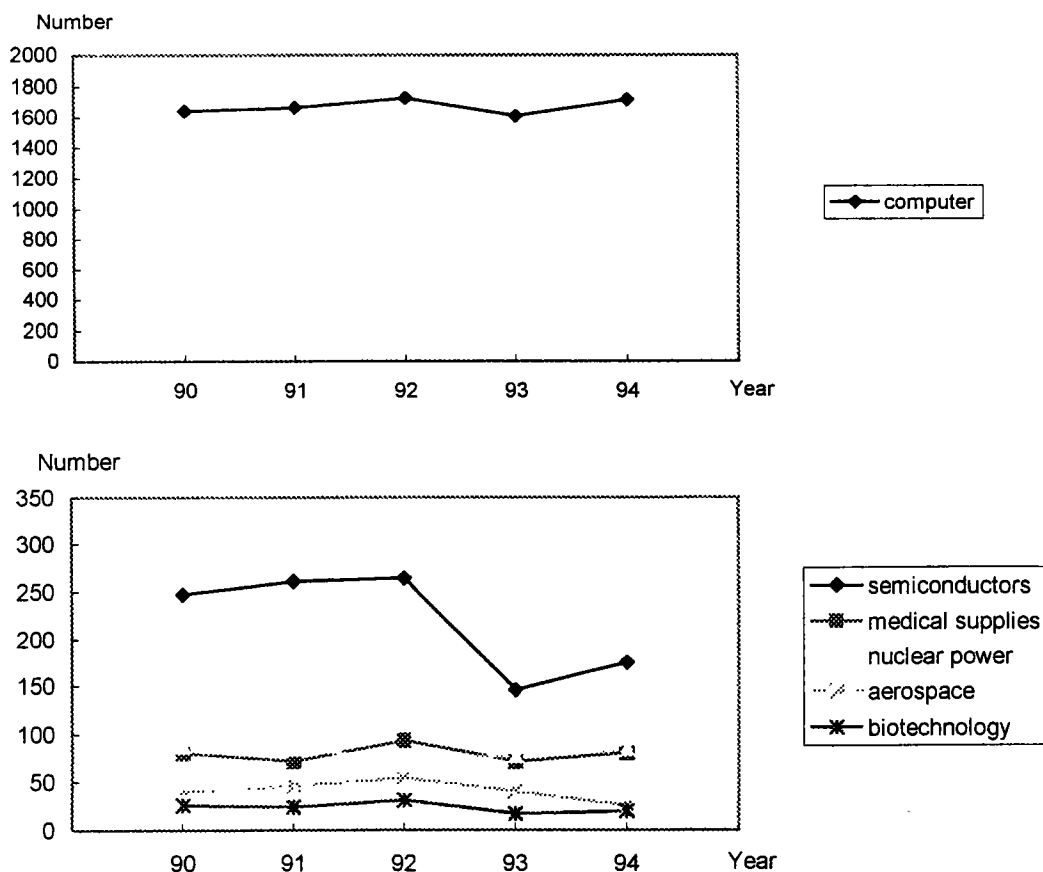
Broken down by country of origin, 1,232 cases of software imports were from the United States (75.8 percent of that category), 109 from Britain, 52 from Singapore, and 47 from Canada. For semiconductors, the country of origin was the United States in 102 cases (58.3 percent of that category), 46 for Singapore, six for South Korea, and five for Britain. For hardware, the country of origin was the United States in 64 cases (87.7 percent of that category), four for Britain, two for France, and two for Canada. In the nuclear power field, there were 73 cases of imports from the United States (86.9 percent of that category) and seven from France. For medical supplies, the country of origin was the United States in 39 cases (48.8 percent of that category), eight for Switzerland, seven for Germany, and six for France. In the aerospace field, there were 21 cases of imports from the United States (84.0 percent of that category), three from

Canada, and one from Germany For biotechnology, the country of origin was the United States in 15 cases (78.9 percent of that category), two for Switzerland, and one each for Britain and Bermuda.

Table 7 Import Situation by Advanced Technology Category

Advanced technology category	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989	Fiscal 1984
Electronic computers	1 714	54.2	6.5	1609	1306	613
Hardware	73	2.3	-11.0	82	85	79
Software	1 629	51.5	7.4	1517	1213	524
Services	12	0.4	20.0	10	8	10
Semiconductors	175	5.5	19.9	146	242	85
Medical supplies	80	2.5	12.7	71	102	57
Nuclear power	84	2.7	9.1	77	81	44
Aerospace	25	0.8	-37.5	40	51	24
Biotechnology	19	0.6	11.8	17	27	15

Figure 5 Import Trends by Advanced Technology Category



1.5 Type of Imported Technology

(1) Breakdown of Imported Technologies

1) Patent Related Contracts

- Number of Patent Related Contracts Down, 54.9% in "Electrical Machinery, Equipment and Supplies"

Of all the new technology import contracts of fiscal 1994, 694 (22.0 percent of all technology import cases) involved patent rights. This was a drop of 1.6 percent from the previous year's figure and is 91 percent the figure from five years ago (Table 8).

Broken down by technology category, the 381 cases for "electrical machinery, equipment and supplies" accounted for 54.9 percent of all patent related contracts. Next came "chemicals," "general machinery and tools," and "other products," in that order.

Compared with the previous year, "other products" increased by 20.7 percent, "electrical machinery equipment and supplies" by 7.0 percent, and "chemicals" by 5.6 percent. In contrast, "general machinery and tools" was down 5.5 percent.

The shares of the totals for the different classification entries accounted for by patent related contracts was as follows: 54.3 percent for "chemicals," 42.2 percent for "other products," 37.2 percent for "general machinery and tools," and 18.2 percent for "electrical machinery, equipment and supplies."

Next, a comparison of the number of import cases with five years before shows that except for "electrical machinery, equipment and supplies," which were 130 percent of the 1989 level, all the other entries declined. (See Part 3, Statistical Table 3-5.)

2) Knowhow Related Contracts

- Number of Knowhow Related Contracts Up, but Only 130% Level Five Years Previous in "Electrical Machinery, Equipment and Supplies"

Contracts involving the transfer of knowhow numbered 2,451, which was 77.5 percent of all technology import cases. (Of these, 1,619 involved software [66.1 percent of knowhow related contracts].) This was a 2.9 percent increase over the previous year and amounts to 110 percent of the figure from five years ago (Table 9).

Broken down by technology category, the 1,860 cases for "electrical machinery, equipment and supplies" accounted for 75.9 percent of all patent related contracts. (Of these, 1,612 cases, or 86.7 percent of all knowhow related cases in the entry, involved software.) Next came "general machinery and tools," "chemicals," and "precision instruments," in that order.

Compared with the previous year, "precision instruments" increased by 18.9 percent, "chemicals" increased by 9.1 percent, "general machinery and tools" increased by 6.2 percent, and "electrical machinery, equipment and supplies" increased by 4.8 percent.

Table 8 Number of Patent Related Contracts by Technology Classification

Technology Classification	Fiscal 1994	Of which, transfers	Share of classification entry accounted for by patents (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Electrical machinery, equipment and supplies	3 8 1	1 3	1 8 . 2	7 . 0	3 5 6	3 0 2
Chemicals	9 5	4	5 4 . 3	5 . 6	9 0	1 3 5
General machinery and tools	8 6	5	3 7 . 2	- 5 . 5	9 1	1 1 6
Other products	3 5	1	4 2 . 2	2 0 . 7	2 9	4 3
Total	* 6 9 4	3 3	2 2 . 0	- 1 . 6	7 0 5	7 6 0

(Note) Figures for patents, knowhow, and trademarks overlap.

Table 9 Number of Knowhow Related Contracts by Technology Classification

Technology Classification	Fiscal 1994	Share of classification entry accounted for by knowhow transfers (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Electrical machinery, equipment and supplies	1860	8 8 . 9	4 . 8	1 7 7 4	1 4 1 4
(Of which, software related)	(1612)	(99.4)	(7.0)	(1507)	(1196)
General machinery and tools	205	8 8 . 7	6 . 2	1 9 3	2 5 7
Chemicals	132	7 5 . 4	9 . 1	1 2 1	1 8 1
Precision instruments	44	4 8 . 9	1 8 . 9	3 7	3 3
Total	* 2 4 5 1	7 7 . 5	2 . 9	2 3 8 2	2 2 6 3

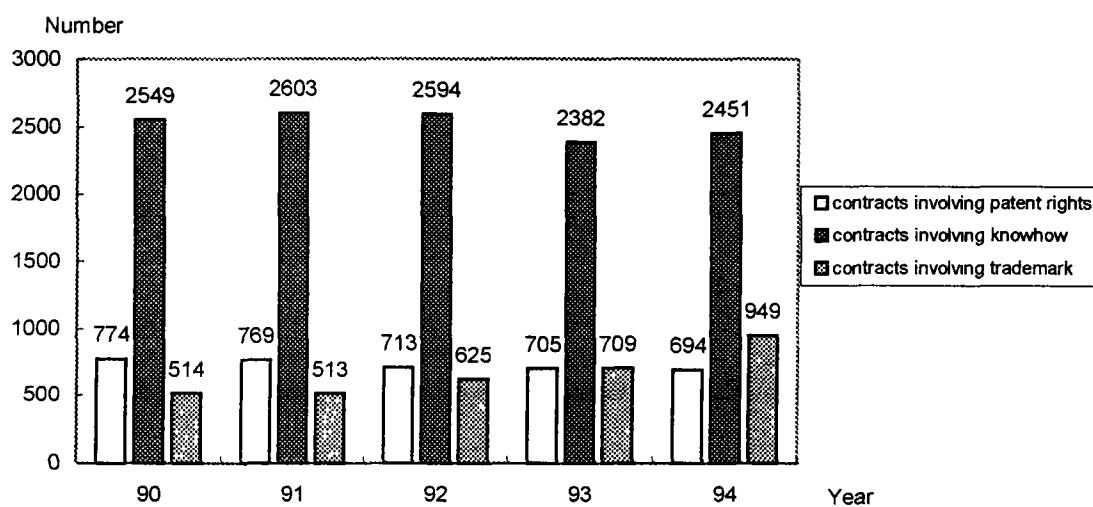
(Note) Figures for patents, knowhow, and trademarks overlap.

Table 10 Number of Trademark Related Contracts by Technology Classification

Technology Classification	Fiscal 1994	Share of classification entry accounted for by trademark contracts (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Electrical machinery, equipment and supplies	4 2 5	2 0 . 3	7 4 . 2	2 4 4	3 6
Clothing and textile products	1 8 8	9 7 . 4	2 7 . 9	1 4 7	1 7 6
(Of which, trademark only)	(165)	(100.0)	(27 9)	(129)	(155)
Textiles	5 9	1 0 0 . 0	1 6 8 . 2	2 2	1 9
(Of which, trademark only)	(56)	(100.0)	(180 0)	(20)	(18)
Precision instruments	5 2	5 7 . 8	1 1 6 . 7	2 4	2 6
Other products	4 4	5 3 . 0	1 0 . 0	4 0	6 5
Total	* 9 4 9	3 0 . 0	3 3 . 9	7 0 9	5 1 2

(Note) Figures for patents, knowhow, and trademarks overlap.

Figure 6 Trends in Types of Imported Technology



The shares of the totals for the different classification entries accounted for by knowhow related contracts was as follows: 88.9 percent for "electrical machinery, equipment and supplies," 88.7 percent for "general machinery and tools," 75.4 percent for "chemicals," and 48.9 percent for "precision instruments."

Next, a comparison of the number of import cases with five years before shows that "electrical machinery, equipment and supplies," was 130 percent, "general machinery and tools" was 80 percent, "chemicals" was 73 percent, and "precision instruments" was 130 percent of the 1989 level

3) Trademark Related Contracts

- Large Increase in Number of Trademark Related Contracts

Of all the new technology import contracts of fiscal 1994, 949 (30.0 percent of all technology import cases) involved trademark rights. This was an increase of 33.9 percent from the previous year's figure and is 190 percent the figure from five years ago (Table 10).

Broken down by Technology Classification, the 425 cases for "electrical machinery, equipment and supplies" accounted for 44.8 percent of all trademark related contracts. Next came "clothing and textile products" and "textiles," in that order.

Compared with the previous year, "textiles" increased by 168.2 percent, "precision instruments" by 116.7 percent, and "electrical machinery, equipment and supplies" by 74.2 percent.

The shares of the totals for the different classification entries accounted for by trademark related contracts was as follows: 100 percent for "textiles," 97.4 percent for "clothing and textile products," 57.8 percent for "precision instruments," 53.0 percent for "other products," and 20.3 percent for "electrical machinery, equipment and supplies."

Next, a comparison of the number of import cases with five years before shows that while "electrical machinery, equipment and supplies" was 11.8 times, "textiles" 3.1 times, "precision instruments" 2.0 times, and "clothing and textile products" 1.1 times the 1989 level, "other products" was only 68 percent of the level five years previous.

(2) Trends in Types of Imported Technology

- Trademarks on the Rise, While Patents Decline

Figure 6 shows the trends in technology import cases broken down by technology types, such as patent, knowhow, and trademark.

Since 1990, the number of patent related technology import cases has been declining.

Knowhow related technology import cases were exhibiting strong growth, then dipped somewhat in 1992 and 1993 before again expanding.

Trademark related technology import cases has remained pretty constant in number for about three years, then suddenly increased beginning in 1992. This is a sharp contrast with the decline in the number of patent related cases and the trend in knowhow related cases.

1.6 Characteristics of Contract Conditions

(1) Payment Conditions

- 153 Cases of No-compensation Contracts, down 20.7% from Previous Year

Dividing the new technology import contracts in fiscal 1994 by payment conditions into "onerous" and "gratuitous" categories indicates that 153 cases, or 4.8 percent of the total, fall into the "gratuitous" category. This is a decrease of 20.7 percent from the preceding year's level.

Broken down by Technology Classification, there were 115 cases related to "electrical machinery, equipment and supplies," a 27.2 percent decrease from the preceding year. This entry was followed by "chemicals" and "general machinery and tools," in that order.

The 3,008 contracts involving compensation accounted for 95.2 percent of the total, for an increase of 6.1 percent over the previous year. (See Part 3, Statistical Table 3-6.)

- Initial Payment Only Contracts 37.5% of Total

Of the contracts involving compensation, 1,186, or 37.5 percent of the total, were on an "initial payment only" basis. This is a decrease of 4.8 percent from the previous year's level (Table 11).

Broken down by Technology Classification (Table 12), contracts involving "electrical machinery, equipment and supplies" were the most numerous at 896, down 12.3 percent from the year before. This entry was followed by "general machinery and tools" and "chemicals," in that order.

The shares of the total accounted by these three entries was as follows: 42.8 percent for "electrical machinery, equipment and supplies," 44.2 percent for "general machinery and tools," and 29.7 percent for "chemicals."

The 583 contracts involving "initial payment plus running royalties" accounted for 18.4 percent of the total, a 2.7 percent decrease from the previous year.

Broken down by Technology Classification, there were 401 contracts involving "electrical machinery, equipment and supplies" (down 2.4 percent from the year before), followed by "chemicals" and "general machinery and tools," in that order.

The share of their respective classification entries of contracts involving "initial payment plus running royalties" were as follows: 19.2 percent of "electrical machinery, equipment and supplies," 33.7 percent of "chemicals," and 22.5 percent of "general machinery and tools."

The 863 contracts involving "running royalties only" accounted for 27.3 percent of the total, a substantial increase of 45.0 percent over the previous year.

Broken down by Technology Classification, there were 567 contracts involving "electrical machinery, equipment and supplies" (up 73.9 percent from the year before), 55 involving "clothing and textile products" (up 48.6 percent from the year before), and 48 involving "general machinery and tools" (down 9.4 percent from the year before)

The share of their respective classification entries of contracts involving "running royalties

only" were as follows: 27.1 percent of "electrical machinery, equipment and supplies," 28.5 percent of "clothing and textile products," and 20.8 percent of "general machinery and tools."

Table 11 Payment Conditions

Payment conditions	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993
Initial payment only	1 1 8 6	3 7. 5	- 4. 8	1 2 4 6
Initial payment plus running royalties	5 8 3	1 8. 4	- 2. 7	5 9 9
Running royalties only	8 6 3	2 7. 3	4 5. 0	5 9 5
Running royalties plus minimum payment	2 9 3	9. 3	- 4. 6	3 0 7
Initial payment plus running royalties plus minimum payment	8 3	2. 6	- 6. 7	8 9
Gratuitous condition	1 5 3	4. 8	- 2 0. 7	1 9 3

Table 12 Payment Conditions by Major Technology Classification Entries

Payment conditions	Electrical machinery, equipment and supplies	General machinery and tools	Clothing and textile products	Chemicals	Precision instruments
Number of cases by Technology Classification	2092(100)	231(100)	193(100)	175(100)	90(100)
Initial payment only	896(42.8)	102(44.2)	21(10.9)	52(29.7)	19(21.1)
Initial payment plus running royalties	401(19.2)	52(22.5)	1(0.5)	59(33.7)	19(21.1)
Running royalties only	567(27.1)	48(20.8)	55(28.5)	37(21.1)	17(18.9)
Running royalties plus minimum payment	79(3.8)	4(1.7)	111(57.5)	3(1.7)	28(31.1)
Initial payment plus running royalties plus minimum payment	34(1.6)	16(6.9)	4(2.1)	8(4.6)	2(2.2)
Gratuitous condition	115(5.5)	9(3.9)	1(0.5)	16(9.1)	5(5.6)

Figures in parentheses () indicate share (%) of Technology Classification.

The 293 contracts involving "running royalties plus minimum payment" accounted for 9.3 percent of the total, a decrease of 4.6 percent from the previous year.

Broken down by Technology Classification, the 111 contracts involving "clothing and textile products" (up 19.4 percent from the year before) led the pack. This was followed by 79 contracts involving "electrical machinery, equipment and supplies" (up 8.2 percent from the year before).

The 83 contracts involving "initial payment plus minimum payment plus running royalties" accounted for 2.6 percent of the total, a decrease of 6.7 percent from the previous year (See Part 3, Statistical Table 3-7.)

The aggregate number of contracts including an initial payment was 1,852, or 61.6 percent of the total. This was a decrease of 4.2 percent from the preceding year. (See Part 3, Statistical Table 3-6.)

- 56.6% Have Running Royalty Rate of "Other"

The aggregate of 1,822 of contracts including running royalties accounted for 57.6 percent of the total, an increase of 14.6 percent from the previous year. However, contracts involving no initial payment but instead stipulating either running royalties only or running royalties plus minimum payment increased 28.2 percent from the year before.

Broken down by rate (Figure 13), the 1,031 cases with a rate of "other" (Note) were the most numerous, accounting for 56.6 percent of all contracts involving running royalties. This was followed by 258 for "2 percent to less than 5 percent" (14.2 percent of all contracts of this type), 233 for "8 percent or more" (12.8 percent of all contracts of this type), 211 for "5 percent to less than 8 percent" (11.6 percent of all contracts of this type), and 89 for "less than 2 percent" (4.9 percent of all contracts of this type).

Compared with the preceding year, the increase of 40.8 percent for "other" was the largest. All other rates declined.

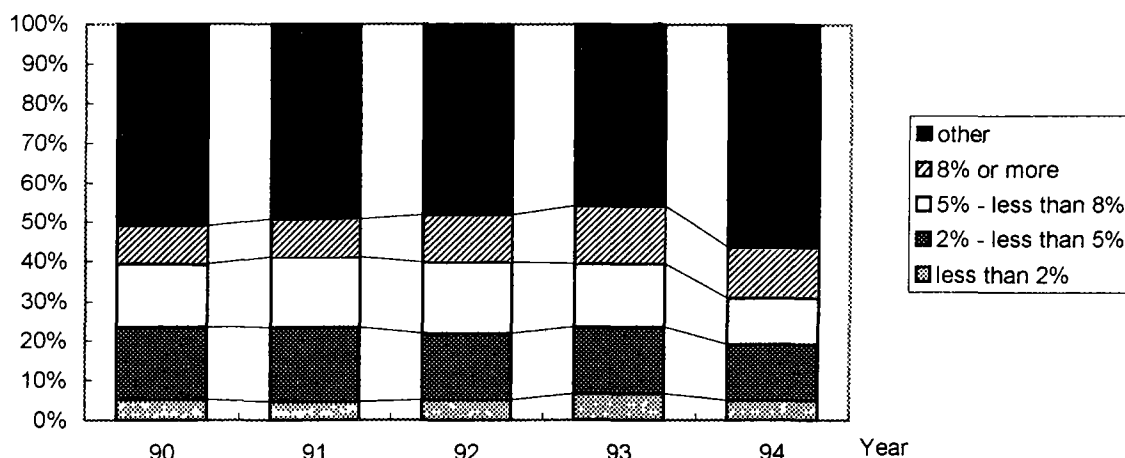
A comparison of each rate with the level five years previous revealed the following: "8 percent or more" increased to 160 percent the 1989 level, "other" increased to 150 percent the 1989 level, and "less than 2 percent" increased to 130 percent the 1989 level. In contrast, "5 percent to less than 8 percent" declined to 71 percent the 1989 level and "2 percent to less than 5 percent" declined to 75 percent the 1989 level.

Breaking down each Technology Classification entry by royalty rate (Table 14) shows that the "other" rate was most numerous for "electrical machinery, equipment and supplies" related contracts, with 811 cases (up 42.5 percent from the previous year) and accounting for 75.0 percent of all running royalty contracts for this classification entry. In the "general machinery and tools", "other" was most numerous with 53 cases (up 32.5 percent from the previous year). In the "clothing and textile products", "5 percent to less than 8 percent" was most numerous with 60 cases (down 4.8 percent from the previous year). In the "chemicals" category, "2 percent to less than 5 percent" was most numerous with 41 cases (up 24.2 percent from the previous year). In the "precision instruments", "5 percent to less than 8 percent" was most numerous with 19 cases (up 46.2 percent from the previous year).

(See Part 3, Statistical Table 3-6.)

(Note) Running royalty rates of "other" are not calculated as a percentage. For example, there may be a flat fee per unit sold.

Figure 7 Trends in Running Royalties



(Note) Figures indicate percentage of all cases involving running royalties.

Table 13 Situation of Running Royalties

Royalty rate	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Less than 2%	8 9	4 . 9	- 1 5 . 2	1 0 5	6 8
2% to less than 5%	2 5 8	1 4 . 2	- 4 . 1	2 6 9	3 4 2
5% to less than 8%	2 1 1	1 1 . 6	- 1 5 6	2 5 0	2 9 7
8% or more	2 3 3	1 2 . 8	- 0 . 4	2 3 4	1 4 6
Other	1 0 3 1	5 6 . 6	4 0 . 8	7 3 2	7 0 4
Total	1 8 2 2	1 0 0 . 0	1 4 . 6	1 5 9 0	1 5 5 7

Table 14 Running Royalties by Technology Classification

Royalty rate	Electrical machinery, equipment and supplies	General machinery and tools	Clothing and textile products	Chemicals	Precision instruments
Less than 2%	44(-20.0)	8(0.0)	6(50.0)	4(-42.9)	10(900.0)
2% to less than 5%	64(-1.5)	29(-40.8)	46(70.4)	41(24.2)	13(-13.3)
5% to less than 8%	15(-40.0)	22(-18.5)	60(-4.8)	27(-10.0)	19(46.2)
8% or more	147(14.0)	8(33.3)	20(-4.8)	20(-4.8)	11(-26.7)
Other	811(42.5)	53(32.5)	39(77.3)	15(-25.0)	13(44.4)
Total	1081(28.2)	120(-7.7)	171(24.8)	107(-3.6)	66(24.5)

Figures in parentheses () indicate percent change from previous year.

(2) Contract Term

- Contract term of "1 year or more but less than 5 years" was 36.8 percent of the total

A breakdown of new technology import contracts in fiscal 1994 (3,161 cases) by contract term (Table 15) shows that "1 year or more but less than 5 years" was the most numerous, at 1,163 cases or 36.8 percent of the total. This was followed by other (Note) with 1,061 cases (33.6 percent of the total), "5 years or more but less than 10 years" with 376 cases (11.9 percent of the total), "through expiration of patent, etc." with 240 cases (7.6 percent of the total), "10 years or more but less than 15 years" with 155 cases (4.9 percent of the total), "less than 1 year" with 118 cases (3.7 percent of the total), and "15 years or more" with 48 cases (1.5 percent of the total).

Compared with the preceding year, "1 year or more but less than 5 years" and "5 years or more but less than 10 years" both increased, by 28.7 percent and 2.5 percent, respectively. In contrast, "15 years or more" decreased by 46.7 percent, "less than 1 year" decreased by 15.7 percent, "10 years or more but less than 15 years" decreased by 14.4 percent, "other" decreased by 3.9 percent, and "through expiration of patent, etc." decreased by 1.2 percent.

Compared with five years previous, "1 year or more but less than 5 years" was 150 percent the level in 1989 and "5 years or more but less than 10 years" was 110 percent the level in 1989, while "15 years or more" was only 62 percent the level in 1989 and "10 years or more but less than 15 years" was 64 percent the level in 1989.

A breakdown of contract terms by Technology Classification (Table 16) showed that in the "electrical machinery, equipment and supplies" the 800 contracts with a term of "1 year or more but less than 5 years" (up 41.8 percent from the previous year) were the most numerous, accounting for 38.2 percent of all contracts involving "electrical machinery, equipment and supplies." In the case of "general machinery and tools" as well, contracts with a term of "1 year or more but less than 5 years" were also the most numerous at 54 cases (up 20.0 percent from the previous year). This was also the case in the "clothing and textile products", which had 115 contracts with a term of "1 year or more but less than 5 years" (up 22.3 percent from the previous year). In the "chemicals", contracts with a term of "other" were the most numerous at 68 cases (up 54.5 percent from the previous year), and in the "precision instruments", contracts with a term of "1 year or more but less than 5 years" were the most numerous at 39 cases (up 69.6 percent from the previous year).

(See Part 3, Statistical Table 3-8.)

(Note) Contracts with a term of "other" include contracts with no specified term, contracts in perpetuity, and contracts set to expire at the time another agreement expires.

Figure 8 Trends in Contract Terms

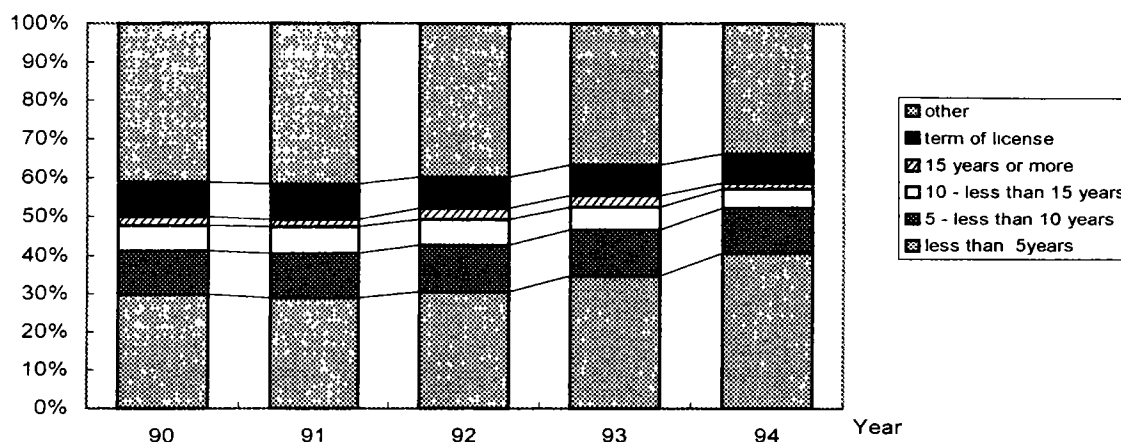


Table 15 Situation of Contract Terms

Contract term breakdown	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Less than 1 year	1 1 8	3 . 7	- 1 5 . 7	1 4 0	1 1 6
1 year or more but less than 5 years	1 1 6 3	3 6 . 8	2 8 . 7	9 0 4	7 7 9
5 years or more but less than 10 years	3 7 6	1 1 . 9	2 . 5	3 6 7	3 3 2
10 years or more but less than 15 years	1 5 5	4 . 9	- 1 4 . 4	1 8 1	2 4 1
15 years or more	4 8	1 . 5	- 4 6 . 7	9 0	7 8
Through expiration of patent, etc.	2 4 0	7 . 6	- 1 . 2	2 4 3	2 9 6
Other	1 0 6 1	3 3 . 6	- 3 . 9	1 1 0 4	1 0 5 6

Table 16 Contract Terms by Technology Classification

Contract term breakdown	Electrical machinery, equipment and supplies	General machinery and tools	Clothing and textile products	Chemicals	Precision instruments
Less than 1 year	68(-20.0)	21(0.0)	7(-36.4)	4(-42.9)	4(100.0)
1 year or more but less than 5 years	800(41.8)	54(20.0)	115(22.3)	27(8 0)	39(69.6)
5 years or more but less than 10 years	199(17.1)	47(-2.1)	36(-5.3)	12(-45.5)	10(-9.1)
10 years or more but less than 15 years	58(-15.9)	34(-12.8)	2(-50.0)	21(5.0)	9(28.6)
15 years or more	23(-23.3)	9(50.0)	0(-)	9(-35.7)	1(-80.0)
Through expiration of patent, etc.	148(2.1)	14(-39.1)	0(-)	34(6.3)	13(8.3)
Other	796(-17.1)	52(33.3)	33(725.0)	68(54.5)	14(55.6)

Figures in parentheses () indicate percent change from previous year.

(3) Cross-licensing Contracts

- 113 Cases of Cross-licensing Contracts

Of the new technology import contracts in fiscal 1994, 113 (or 3.6 percent of the total) were cross-supply contracts involving both imports and exports of technology. This was a 7.6 percent increase over the previous year and was 120 percent the level of five years before.

Broken down by Technology Classification (Table 17), "electrical machinery, equipment and supplies," "chemicals," "general machinery and tools," and "non-ferrous metals" were the most numerous, in that order. All of these top five classification entries increased from their levels of five years before.

(4) Exclusive Rights in Japan

- Contracts for Exclusive Rights in Japan 30.1% of Total, "Electrical Machinery, Equipment and Supplies" 92% of Level Five Years Previous

Of the new technology import contracts in fiscal 1994, 950 (or 30.1 percent of the total) were contracts conferring exclusive manufacturing or sales rights in Japan. This was unchanged from the previous year and was 86 percent the level of five years before.

Broken down by Technology Classification (Table 18), "electrical machinery, equipment and supplies" accounted for 43.6 percent of all exclusive rights contracts with 414 cases. This was followed by "clothing and textile products," "general machinery and tools," "chemicals," and "precision instruments," in that order.

Compared with the preceding year, all of the top classification entries increased except for "electrical machinery, equipment and supplies." Compared with five years before, "precision instruments" grew to 140 percent its level in 1989, while all the other top entries experienced a decrease.

(5) Renewal Rights

- 1,157 Cases of Contracts with Renewal Rights, a 15.1% Increase over the Preceding Year

Of the new technology import contracts in fiscal 1994, 1,157 (or 36.6 percent of the total) were contracts including renewal rights allowing the transfer of the imported technology to third parties. This was a 15.1 percent increase from the previous year and was 140 percent the level of five years before.

Broken down by Technology Classification (Table 19), "electrical machinery, equipment and supplies" accounted for 65.5 percent of all renewal rights contracts with 758 cases. This was followed by "clothing and textile products," "chemicals," "general machinery and tools," and "precision instruments," in that order.

Compared with the preceding year, "precision instruments" increased 115.4 percent, "chemicals" increased 39.7 percent, and "clothing and textile products" increased 27.1 percent.

Compared with five years before, all of these entries increased, both "electrical machinery, equipment and supplies" and "precision instruments" growing to 180 percent their levels in 1989.

Table 17 Cross-licensing Trends by Major Technology Classification

Technology Classification	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Electrical machinery, equipment and supplies	6 8	6 0 . 2	6 . 3	6 4	5 9
Chemicals	1 7	1 5 . 0	5 4 . 5	1 1	6
General machinery and tools	1 6	1 4 . 2	7 7 . 8	9	1 4
Non-ferrous metals	5	4 . 4	4 0 0 . 0	1	1
Total	1 1 3	1 0 0 . 0	7 . 6	1 0 5	9 5

Table 18 Exclusive-rights Trends by Major Technology Classification

Technology Classification	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Electrical machinery, equipment and supplies	4 1 4	4 3 . 6	- 2 . 4	4 2 4	4 5 2
Clothing and textile products	1 4 0	1 4 . 7	6 . 1	1 3 2	1 4 7
General machinery and tools	8 6	9 . 1	1 . 2	8 5	1 1 1
Chemicals	7 8	8 . 2	8 . 3	7 2	8 7
Precision instruments	4 5	4 . 7	2 5 . 0	3 6	3 2
Total	9 5 0	1 0 0 . 0	0 . 0	9 5 0	1 1 0 7

Table 19 Transfer-rights Trends by Major Technology Classification (Subcategory)

Technology Classification	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Electrical machinery, equipment and supplies	7 5 8	6 5 . 5	1 4 . 0	6 6 5	4 2 3
Clothing and textile products	8 9	7 . 7	2 7 . 1	7 0	8 8
Chemicals	8 1	7 . 0	3 9 . 7	5 8	6 5
General machinery and tools	7 4	6 . 4	4 . 2	7 1	6 8
Precision instruments	2 8	2 . 4	1 1 5 . 4	1 3	1 6
Total	1 1 5 7	1 0 0 . 0	1 5 . 1	1 0 0 5	8 1 4

(6) Number of Import Cases by Size of Capital

- 51.0% Have Capital of 10 Billion Yen or More

A breakdown of new technology import contracts in fiscal 1994 by size of capital shows that the 1,025 cases with capital of "50 billion yen or more" accounted for 32.4 percent of the total. Next came "10 billion yen or more but less than 50 billion yen" with 588 cases. Taken together, contracts with capital of 10 billion yen or more accounted for 51.0 percent, or more than half, of the total (Table 20) (Figure 9). Compared with the preceding year, "less than 50 million yen" increased 66.0 percent and "50 million yen or more but less than 100 million yen" increased 38.1 percent. In contrast, "1 billion yen or more but less than 5 billion yen" decreased 20.6 percent, "100 million yen or more but less than 500 million yen" decreased 15.7 percent, and "500 million yen or more but less than 1 billion yen" decreased 2.6 percent. Compared with five years previous, "less than 50 million yen" increased the most to 170 percent the figure for 1989. If we do a breakdown by imported technology to determine the cause for the concentration of 1,613 cases among enterprises capitalized at 10 billion yen or more (Table 21), we see the same trend for the three technology categories come in first, second, and fourth, in number of cases: "electrical machinery, equipment and supplies," "general machinery and tools," and "chemicals." Of these, contracts in the "electrical machinery, equipment and supplies" by enterprises capitalized at "10 billion yen or more but less than 50 billion yen" decreased 7.5 percent from the preceding year.

On the other hand, contracts in the "general machinery and tools" category by enterprises capitalized at "50 billion yen or more" increased 38.3 percent during the same period.

Also, a breakdown of advanced technology imports by size of capital (Table 22), shows 560 cases for software by enterprises capitalized at "50 billion yen or more," 260 cases by enterprises capitalized at "10 billion yen or more but less than 50 billion yen," and 253 cases by enterprises capitalized at "100 million yen or more but less than 500 million yen." For semiconductors, there were 72 cases by enterprises capitalized at "50 billion yen or more" and 62 cases by enterprises capitalized at "100 million yen or more but less than 500 million yen." This indicates a bipolarizing trend, in comparison with the overall picture.

Table 20 Trend in Import Cases by Size of Capital

Size of capital (100 million yen)	Fiscal 1994	Share (%)	Compared with previous year	Fiscal 1993	Fiscal 1989
Less than 0.5	4 2 0	1 3 . 3	6 6 . 0	2 5 3	2 5 1
0.5 - less than 1	1 3 4	4 . 2	3 8 . 1	9 7	1 7 9
1 - less than 5	4 0 8	1 2 . 9	- 1 5 . 7	4 8 4	4 9 8
5 - less than 10	7 5	2 . 4	- 2 . 6	7 7	8 7
10 - less than 50	3 2 0	1 0 . 1	- 2 0 . 6	4 0 3	3 5 6
50 - less than 100	1 6 5	5 . 2	1 2 . 2	1 4 7	1 8 6
100 - less than 500	5 8 8	1 8 . 6	8 . 7	5 4 1	5 0 5
500 or more	1 0 2 5	3 2 . 4	2 . 6	9 9 9	8 2 3
Unclear	2 6	0 . 8	- 7 . 1	2 8	1 3

Unclear: Foundations, corporations, public organizations, educational corporations, special corporations, individuals, etc.

Figure 9 Number of Import Cases by Size of Capital

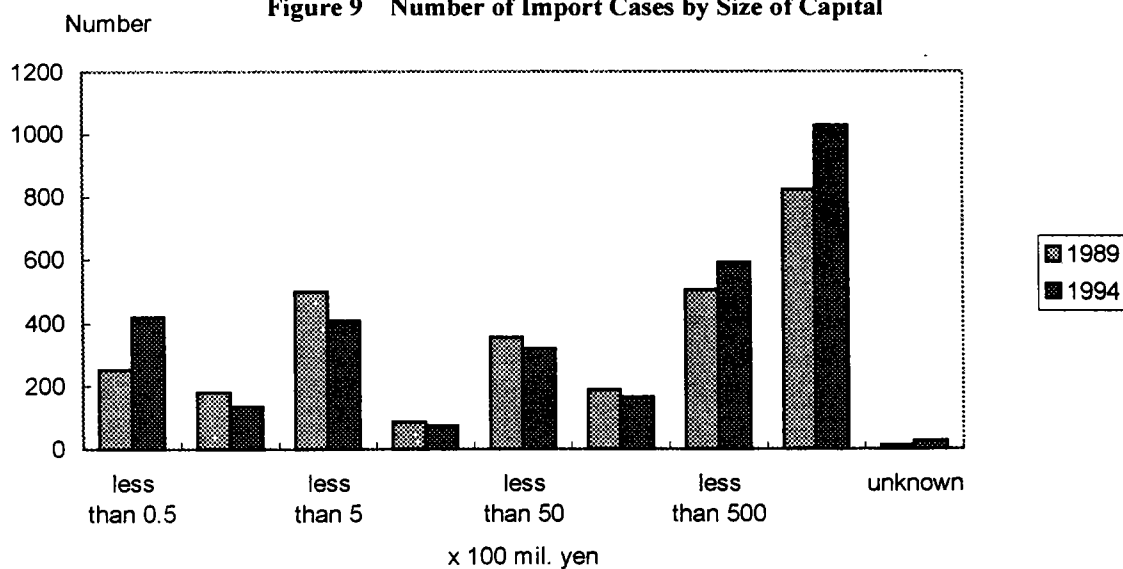


Table 21 Situation of Size of Capital by Major Technology Classification

Size of capital (100 million yen)	Electrical machinery, equipment and supplies	General machinery and tools	Clothing and textile products	Chemicals	Precision instruments
Less than 0.5	223(74.2)	13(0.0)	70(79.5)	5(-28.6)	13(225.0)
0.5 - less than 1	71(47.9)	10(25.0)	15(50.0)	1(-85.7)	6(50.0)
1 - less than 5	281(-24.5)	20(0.0)	23(53.3)	21(31.3)	12(-33.3)
5 - less than 10	42(100.0)	6(-14.3)	4(-50.0)	1(-75.0)	8(33.3)
10 - less than 50	206(-15.2)	22(-29.0)	19(-5.0)	22(-4.3)	9(-10.0)
50 - less than 100	98(24.1)	11(-42.1)	10(0.0)	20(53.8)	8(60.0)
100 - less than 500	359(8.8)	37(-7.5)	28(21.7)	78(14.7)	18(28.6)
500 or more	791(1.7)	112(38.3)	22(-15.4)	25(4.2)	16(100.0)
Unclear	21(-12.5)	0(-)	2(-)	2(0.0)	
Total	2092(3.4)	231(4.5)	193(27.8)	175(6.7)	90(30.4)

Unclear: Foundations, corporations, public organizations, educational corporations, special corporations, individuals, etc.

Figures in parentheses () indicate percent change from previous year.

Table 22 Advanced Technology Import Situation by Size of Capital

Size of capital (100 million yen)	Hardware	Software	Semi- conductors	Nuclear power	Aerospace, etc.	Medical supplies	Biotech- nology
Less than 0.5	4	200	5	2	0	0	0
0.5 - less than 1	1	62	1	0	2	0	0
1 - less than 5	6	253	62	1	3	10	0
5 - less than 10	3	28	1	1	1	1	0
10 - less than 50	2	187	5	7	1	9	0
50 - less than 100	8	58	5	0	2	13	2
100 - less than 500	17	260	24	1	4	36	9
500 or more	32	560	72	72	12	11	6
Unclear	0	21	0	0	0	0	2
Total	73	1629	175	84	25	80	19

(7) Technology Imports by Foreign-owned Companies

The 86 cases of technology imports by foreign-owned (stocks or share of ownership more than 50 percent) companies accounts for 2.7 percent of the total. This is an increase (53.6 percent) over the previous year, the first such increase in three years (Table 23). Broken down by Technology Classification, there were 42 cases for "electrical machinery, equipment and supplies" (48.8 percent of technology imports by foreign-owned companies), 11 cases for "chemicals" (12.8 percent), seven cases for "clothing and textile products" (8.1 percent), five cases for "precision instruments" (5.8 percent), and four cases for "general machinery and tools" (4.7 percent).

The share of their respective classification entries of technology imports by foreign-owned companies were as follows: 6.3 percent for "chemicals" (9.1 percent the preceding year), 5.6 percent for "precision instruments" (1.4 percent the preceding year), 3.6 percent for "clothing and textile products" (3.3 percent the preceding year), and 2.0 percent for "electrical machinery, equipment and supplies" (0.9 percent the preceding year) (Table 24).

Table 23 Technology Classification Entries with Many Imports by Foreign-owned Companies

Technology Classification	Fiscal 1994	Compared with previous year (%)	Fiscal 1993
All entries	86	53.6	56
Electrical machinery, equipment and supplies	42	121.1	19
Chemicals	11	-26.7	15
Clothing and textile products	7	40.0	5
Precision instruments	5	400.0	1
General machinery and tools	4	-20.0	5

Figure 10 Number of Import Cases by Foreign-owned Companies

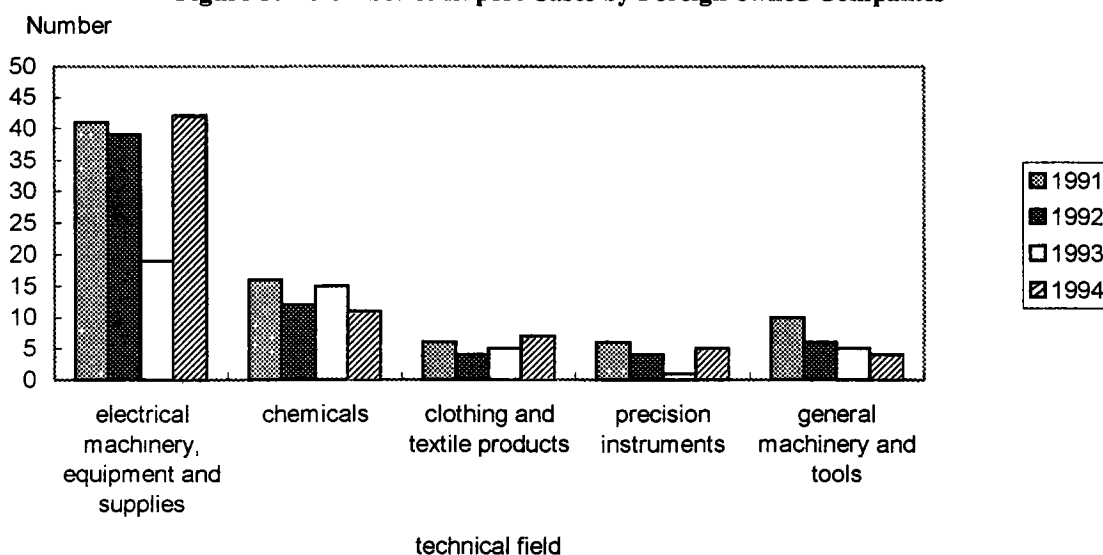
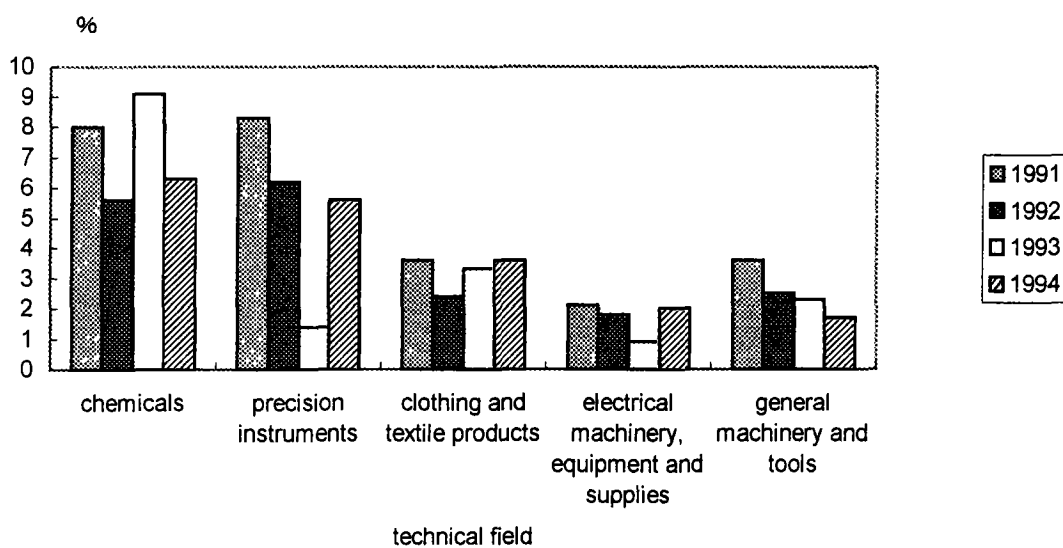


Table 24 Share of Imports by Foreign-owned Companies in Various Technology Classification Entries

Technology Classification	Share accounted for by imports by foreign-owned companies	
	Fiscal 1993	Fiscal 1994
All categories	2 . 7	1 . 8
Chemicals	6 . 3	9 . 1
Precision equipment	5 . 6	1 . 4
Clothing and textile products	3 . 6	3 . 3
Electrical machinery, equipment and supplies	2 . 0	0 . 9
General machinery and tools	1 . 7	2 . 3

Figure 11 Share of Imports by Foreign-owned Companies



1.7 Characteristics of Revised Contracts

- 1,357 Cases of Revised Contracts, 47.8% Revisions to the "Contract Term"

The 1,357 cases of revised contracts in fiscal 1994 represent an increase of 37 (2.8 percent) over the year before (Table 25).

When broken down by type, we see that 304 of these cases involve "inheritance of position," in which the parties to the contract change. This is 22.4 percent of the total and an increase of 21.6 percent from the previous year. Also, there were 273 cases of simple "inheritance of position," in which the contract term, the royalties, etc , were changed.

On the other hand, there were 1,084 cases in which the content of an existing contract was revised, which is a decrease of 1.2 percent from the preceding year.

The shares of the different categories were as follows: cases of a change in the "contract term" were the most numerous at 518, accounting for 47.8 percent of all revisions to the content of existing contracts. This was followed in order to frequency by changes to "running royalties," changes to the "initial payment," changes to the "scope of technology," and changes to the "minimum payment."

If we examine next the content of the changes, the largest share is accounted for by changes resulting in expansion or increase in the content covered. Of changes to the "scope of technology," 96.9 percent involved expansion. Of changes to the "initial payment," 92.4 percent involved increases. Of changes to the "contract term," 91.5 percent involved extensions. (See Part 3, Statistical Table 3-11.)

In comparison to the year before, cases involving "extension of contract term," "increase of minimum payment," and "expansion of scope of technology" all declined, while cases involving "increase of initial payment," "increase of running royalties," "obtaining of exclusive rights," and "obtaining of renewal rights" all increased.

Table 25 Trends in Revised Contracts

Details of revision	Fiscal 1994	Fiscal 1993	Compared with previous year (%)
Total cases	1 3 5 7	1 3 2 0	2 . 8
Inheritance of position	3 0 4	2 5 0	2 1 . 6
Revision of terms of existing contract	1 0 8 4	1 0 9 7	- 1 . 2
Contract term	5 1 8	5 3 0	- 2 . 3
Extension	4 7 4	4 8 6	- 2 . 5
Shortening	8	1 7	- 5 2 . 9
Other	3 6	2 7	3 3 . 3
Initial payment	3 0 4	2 6 7	1 3 . 9
Increase	2 8 1	2 4 2	1 6 . 1
Decrease	1 7	1 9	- 1 0 . 5
Other	6	6	0 . 0
Running royalties	4 6 4	5 2 2	- 1 1 . 1
Increase	2 6 1	2 5 7	1 . 6
Decrease	1 5 2	2 0 9	- 2 7 . 3
Other	5 1	5 6	- 8 . 9
Minimum payment	1 9 1	1 9 0	0 . 5
Increase	1 2 0	1 5 1	- 2 0 . 5
Decrease	6 1	3 3	8 4 . 8
Other	1 0	6	6 6 . 7
Exclusive rights	1 3	4	2 2 5 . 0
Obtaining	7	1	6 0 0 . 0
Surrender	6	3	1 0 0 . 0
Renewal rights	1 4	1 0	4 0 . 0
Obtaining	1 4	8	7 5 . 0
Surrender	0	2	-
Scope of technology	1 9 1	2 1 1	- 9 . 5
Expansion	1 8 5	2 0 5	- 9 . 8
Narrowing	6	4	5 0 . 0
Other	0	2	-

1.8 Import Status by Type of Business

From the start, the data from this survey has been classified by technology and compiled based on the "Standard Industrial Classification for Japan" edited by the Management and Coordination Agency, with the focus on imports of technology from abroad and the content of such technology imports.

Beginning in fiscal 1991, in order to provide a comparative assessment of the technology imports by Industrial Classification in the "Report on the Survey of Research and Development" of statistics from the Management and Coordination Agency statistics, and to verify the diversification of the business activities of many enterprises and the move toward "borderless" activities between industries through imports of overseas technology, we classified technology imports by Industrial Classification and attempted an analysis based on this. For the purpose of this classification, we referred to the "Directory of Commercial Enterprises," edited by the Statistical Bureau of the Management and Coordination Agency. The enterprises were classified based on the "Standard Industrial Classification for Japan" and the data tallied up. (See Part 3, Statistical Table 3-12.)

(1) Breakdown by Business Type in Terms of Industrial Field

Dividing the industrial field into five sections, chemicals, metals, machinery, electrical, and other (based on Part 3, Statistical Table C), we find that the "electrical field," with 2,092 cases, has the largest share (66.2 percent) of the total of 3,161 technology import cases in fiscal 1994. This is followed, in order, by the "machinery field," the "chemicals field," and the "metals field" (Figures 12 and 14).

(Note) "Other fields" comprises the agriculture, forestry, and fisheries industry; the mining industry; the construction industry; food and tobacco; textiles; clothing and textile products; lumber, wood products, and furniture; wood pulp, paper products, and printing; rubber products; tanned leather, leather goods, and furs; ceramics; other products; and other industries.

- In the "Electrical Field," the Communications, Electronics, and Electrical Measuring Equipment Industry is First, at 28.4%

An examination of the technologies imported by the enterprises we have classified into Industrial Classification shows that there were 2,092 cases of imports in the electrical field. This represents 66.2 percent of the total, for an overwhelmingly large share. The reason for this large number of imports in the electrical field is the 1,629 cases of computer software imports.

The most imports in the electrical field were by enterprises in the communications, electronics, and electrical measuring equipment industry, with 594 cases or 28.4 percent. This was followed by the information services and survey industry and the wholesale trade (machinery and equipment), in that order.

In the machinery field, the first through third place positions are occupied by the transport, communications, and public utilities industry; the general machinery manufacturing industry; and the precision instruments manufacturing industry, respectively. In the chemicals field, the first and second place positions are occupied by the manufacturing

industry of drugs and medicines and the industrial chemicals and chemical fibers industry, respectively.

In the metals field, of a total of 42 import cases, the first and second place positions are occupied by the non-ferrous metals and products manufacturing industry and the iron and steel manufacturing industry, respectively.

In other fields, the textiles manufacturing industry is in first place and "other" industries are in fifth. However, the fact that various wholesale and retail tertiary industries occupy the other top spots is a notable feature

Figure 12 Trends in Number of Import Cases by Technology Field

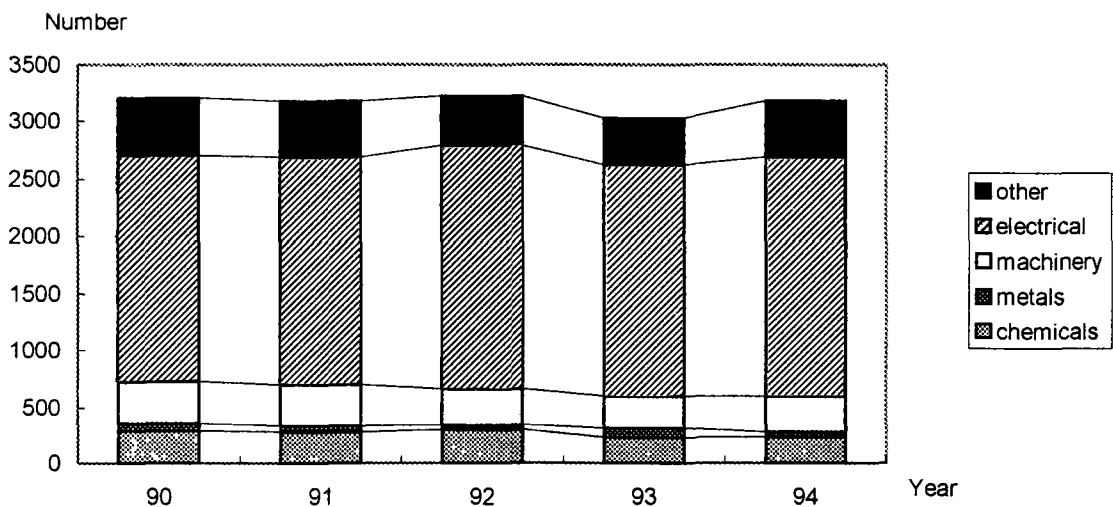


Figure 13 Breakdown of Imported Technologies by Technology Field

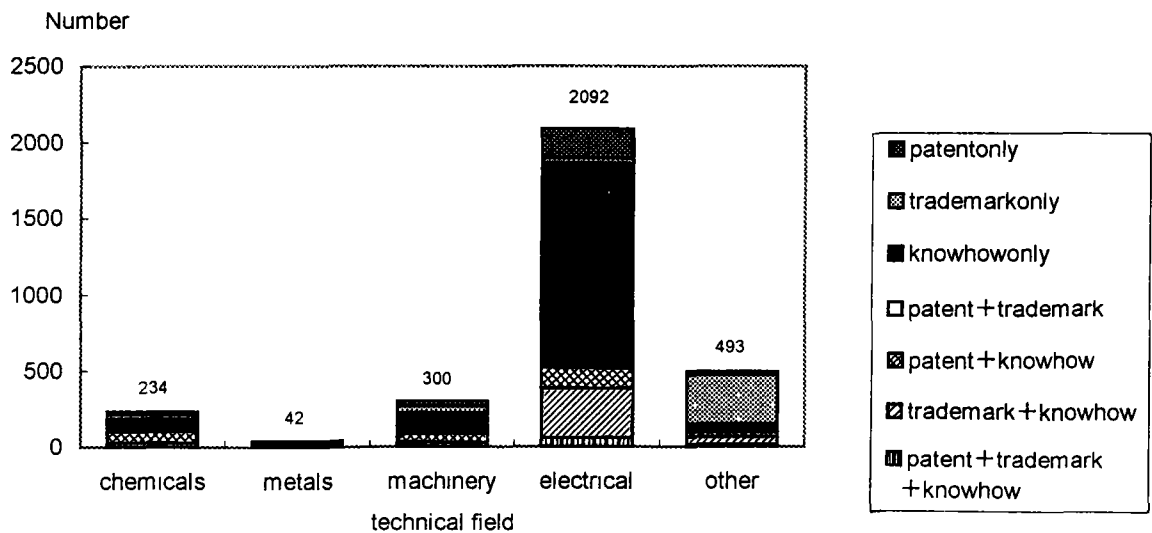
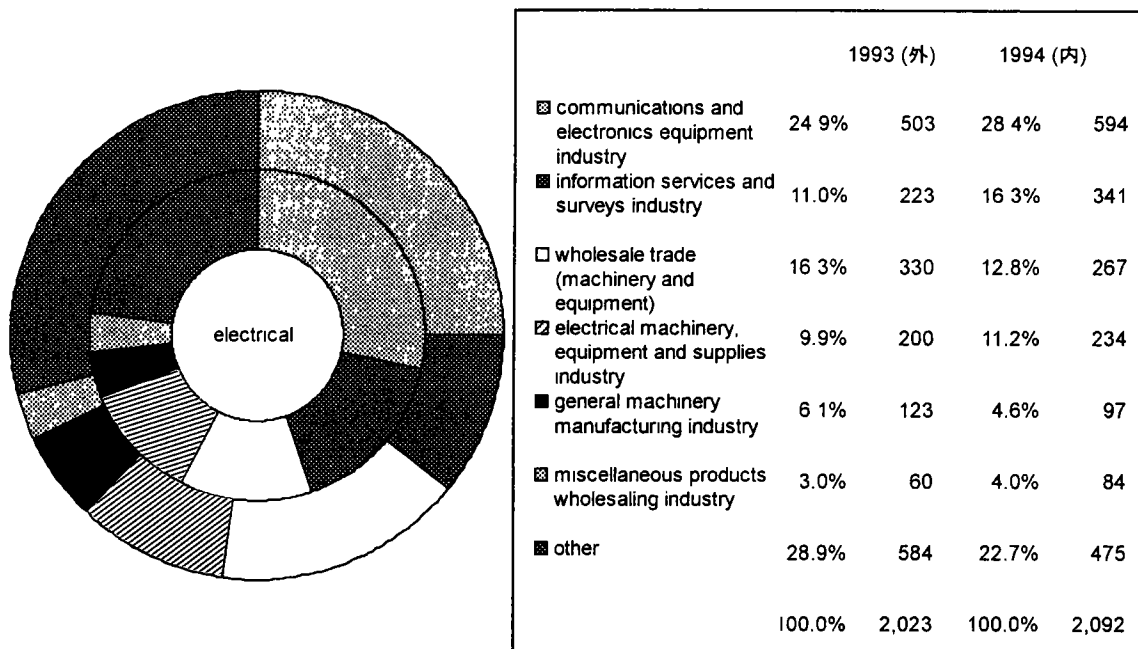
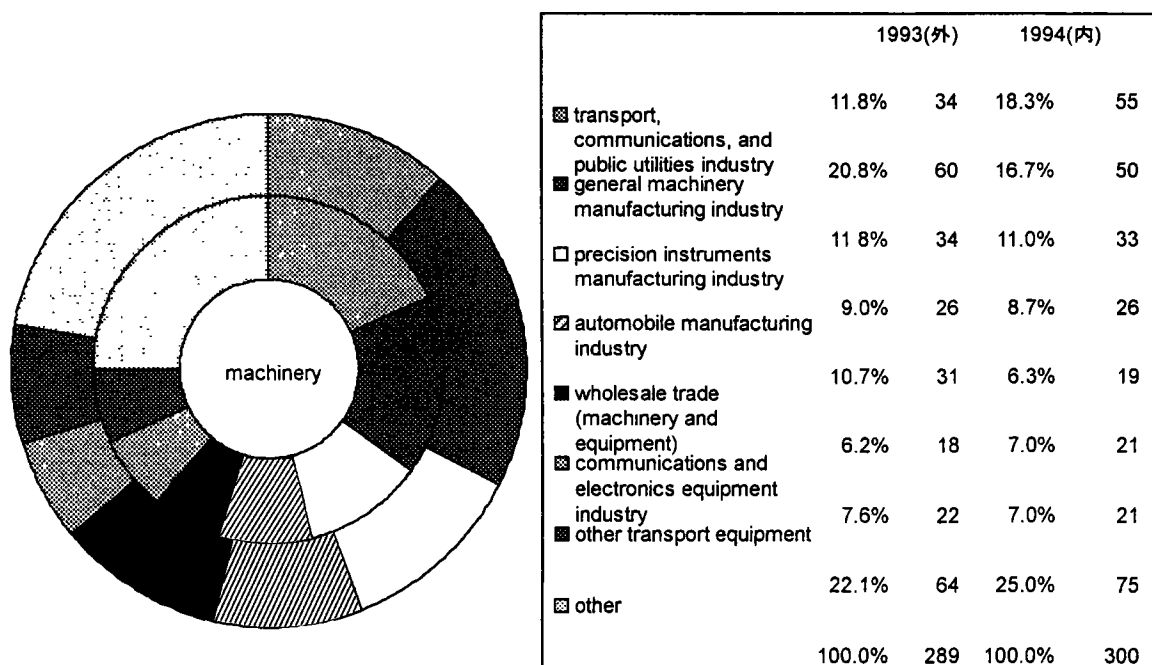


Figure 14 Imported Technologies by Type of Business with Reference to Technology Field

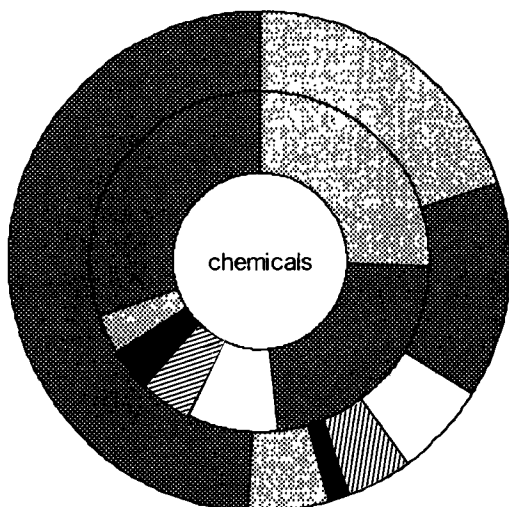
Number of Technology Import Cases in Electrical Field by Type of Business



Number of Technology Import Cases in Machinery Field by Type of Business

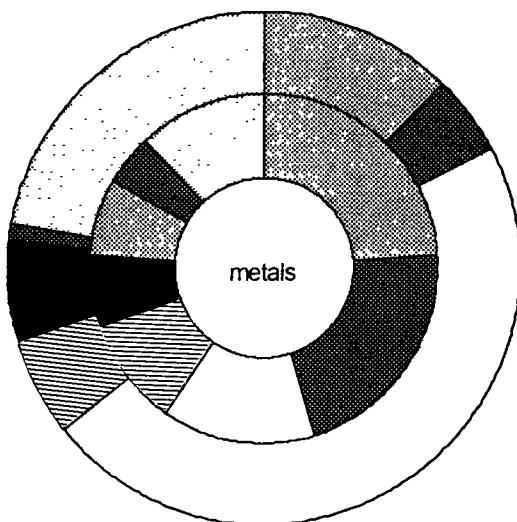


Number of Technology Import Cases in Chemicals Field by Type of Business



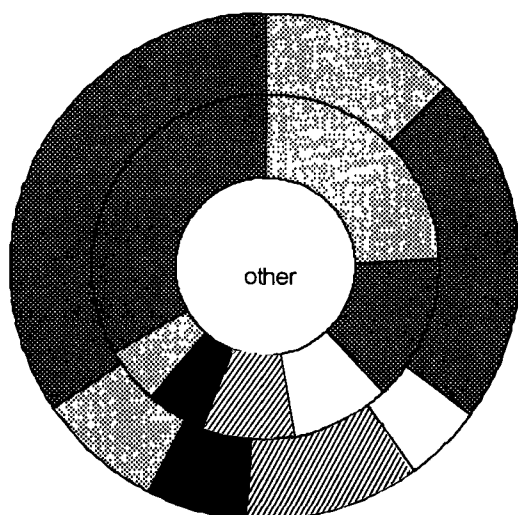
	1993(外)		1994(内)	
☒ drugs and medicines manufacturing industry	20.0%	46	25.6%	60
☒ industrial chemicals and chemical fibers industry	13.9%	32	22.6%	53
□ general machinery manufacturing industry	6.1%	14	8.5%	20
☒ food industry	3.9%	9	5.1%	12
■ other transport equipment manufacturing industry	1.7%	4	4.3%	10
☒ oil and coal products industry	5.2%	12	3.4%	8
■ other	49.1%	113	30.3%	71
	100.0%	230	100.0%	234

Number of Technology Import Cases in Metals Field by Type of Business



	1993(外)		1994(内)	
☒ non-ferrous metals and products manufacturing industry	12.3%	10	23.8%	10
■ iron and steel manufacturing industry	4.9%	4	21.4%	9
□ metal products manufacturing industry	46.9%	38	14.3%	6
☒ automobile manufacturing industry	6.2%	5	9.5%	4
■ general machinery manufacturing industry	6.2%	5	7.1%	3
☒ miscellaneous products wholesaling industry	0.0%	0	7.1%	3
■ plastic products manufacturing industry	1.2%	1	4.8%	2
☒ other	22.2%	18	11.9%	5
	100.0%	81	100.0%	42

Number of Technology Import Cases in Other Fields by Type of Business



	1993(外)		1994(内)	
☒ textiles manufacturing industry	12.6%	51	24.5%	121
■ wholesale trade (textiles and clothing)	22.4%	91	13.4%	66
□ specialist services industry (not falling into other categories)	4.9%	20	9.3%	46
▨ miscellaneous products wholesaling industry	11.1%	45	8.5%	42
■ other manufacturing industries	6.7%	27	5.7%	28
▨ miscellaneous products retailing industry	7.9%	32	5.1%	25
■ other	34.5%	140	33.5%	165
	100.0%	406	100.0%	493

(2) Import Status by Type of Business and Country of Origin

- "Communications and Electronics Equipment Industry" Top among Imports from U.S.A. at 23.4%

The top five countries of origin for technology imports were led by the U.S.A. with 2,056 cases, or 65.0 percent of the total, followed by Britain, France, and Germany, in that order (Figure 15).

A Industrial Classification entry of the enterprises importing from the U.S.A. shows that enterprises in the communications and electronics equipment industry led, with 482 cases. Of these, the largest share (58.3 percent) was accounted for by software imports. In second place was the information services and surveys industry, almost all of which was accounted for by software imports. In third place was the machine tools wholesale industry, of which 87.7 percent was accounted for by software imports.

Then the electrical machinery, equipment and supplies industry and the general machinery manufacturing industry followed, but in both cases the number of software related import cases is the largest.

There were a total of 283 cases of imports from Britain. In first place was the textiles manufacturing industry with 53 cases. All of these were trademark-only imports.

Among imports from France, the textiles manufacturing industry took first place with 30 cases. Second place was the wholesale trade (textiles and clothing) with 20 cases. Most of these cases involved trademark rights.

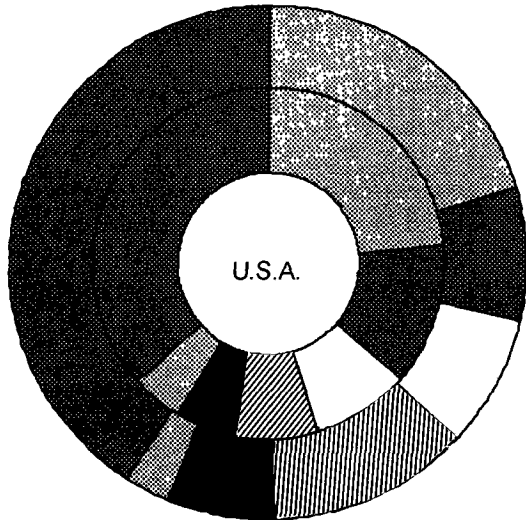
Among imports from Germany, the communications and electronics equipment industry was in first place. From the second place on down, a variety of business types were comparatively evenly represented.

The first place winner among imports from Holland, the communications and electronics equipment industry, accounted for 21.3 percent of the total, but the number of cases was small.

Overall, imports broken down by type of business and country of origin show software technology imports and imports of trademarks to be the top categories. (See Part 3, Statistical Table 3-13.)

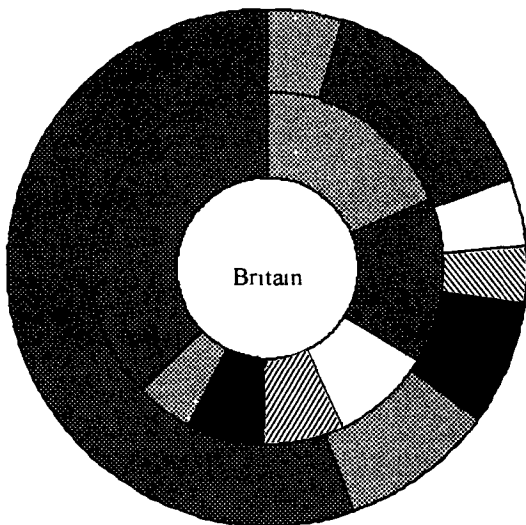
Figure 15 Technology Imports by Type of Business and Country of Origin

Number of Technology Import Cases from the U.S.A. by Industrial Classification



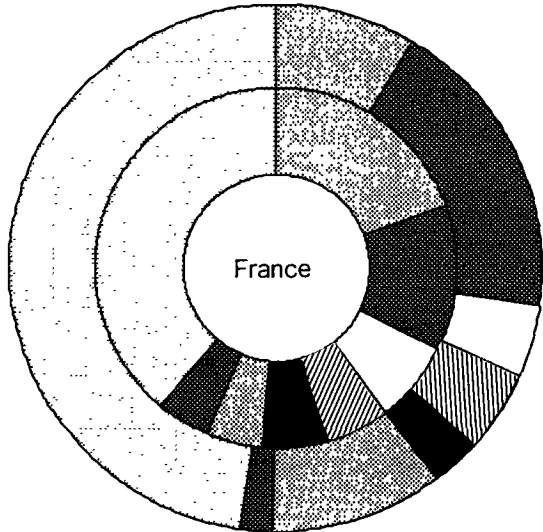
	1993(外)		1994(内)	
communications and electronics equipment industry	20.4%	405	23.4%	482
information services and surveys industry	8.3%	165	13.0%	267
electrical machinery, equipment and supplies industry	8.3%	165	9.1%	188
wholesale trade (machinery and equipment)	12.5%	249	7.5%	155
general machinery manufacturing industry	6.7%	133	5.5%	113
transport, communications, and public utilities industry	2.9%	58	4.7%	97
other	40.8%	810	36.7%	754
	100.0%	1,985	100.0%	2,056

Number of Technology Import Cases from Britain by Industrial Classification



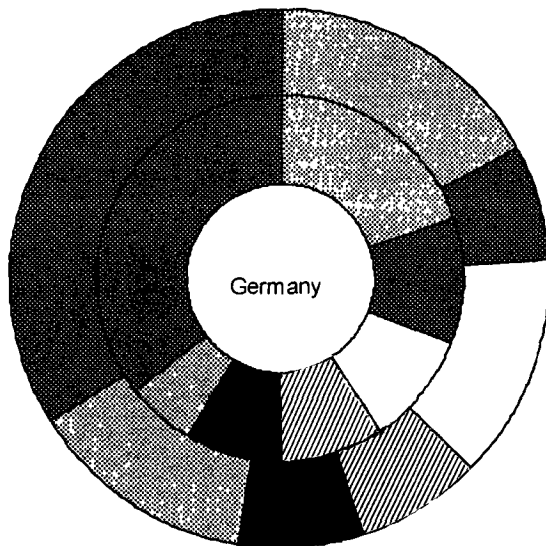
	1993(外)		1994(内)	
textiles manufacturing industry	4.6%	9	18.7%	53
communications and electronics equipment industry	14.9%	29	15.2%	43
wholesale trade (textiles and clothing)	4.1%	8	9.2%	26
specialist services industry (not falling into others)	3.6%	7	7.4%	21
wholesale trade (machinery and equipment)	7.7%	15	7.1%	20
general machinery manufacturing industry	9.7%	19	5.3%	15
other	55.4%	108	37.1%	105
	100.0%	195	100.0%	283

Number of Technology Import Cases from France by Industrial Classification



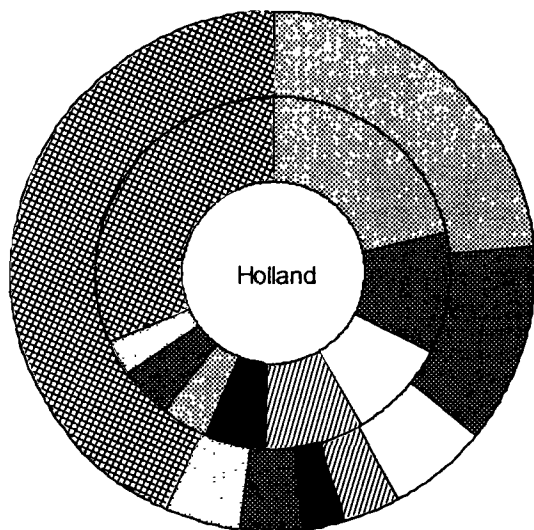
	1993(外)		1994(内)	
▨ textiles manufacturing industry	8.7%	14	19.5%	30
■ wholesale trade (textiles and clothing)	18.6%	30	13.0%	20
□ information services and surveys industry	4.3%	7	7.1%	11
▨ precision instruments manufacturing industry	5.0%	8	5.8%	9
■ miscellaneous products wholesaling industry	3.1%	5	5.8%	9
▨ miscellaneous products retailing industry	10.6%	17	5.2%	8
■ other manufacturing industries	1.9%	3	4.5%	7
▨ other	47.8%	77	39.0%	60
	100.0%	161	100.0%	154

Number of Technology Import Cases from Germany by Industrial Classification



	1993(外)		1994(内)	
▨ communications and electronics equipment industry	17.0%	25	19.7%	25
■ electrical machinery, equipment and supplies industry	6.8%	10	11.0%	14
□ general machinery manufacturing industry	13.6%	20	10.2%	13
▨ automobile manufacturing industry	7.5%	11	8.7%	11
■ industrial chemicals and chemical fibers industry	7.5%	11	8.7%	11
▨ wholesale trade (machinery and equipment)	13.6%	20	6.3%	8
■ other	34.0%	50	35.4%	45
	100.0%	147	100.0%	127

Number of Technology Import Cases from Holland by Industrial Classification



	1993(外)		1994(内)	
☒ communications and electronics equipment industry	23.5%	19	21.3%	19
☒ electrical machinery, equipment and supplies industry	12.3%	10	11.2%	10
☐ general machinery manufacturing industry	6.2%	5	9.0%	8
☒ precision instruments manufacturing industry	3.7%	3	9.0%	8
■ other manufacturing industries	2.5%	2	5.6%	5
☒ other transport equipment	0.0%	0	4.5%	4
■ information services and surveys industry	3.7%	3	4.5%	4
☒ textiles manufacturing industry	4.9%	4	3.4%	3
☒ other	43.2%	35	31.5%	28
	100.0%	81	100.0%	89

(3) Import Status by Type of Business and Imported Technology Type

Of the total of 3,161 import cases, 2,022 are covered by the type of business used in the statistics of the Management and Coordination Agency, and 1,139 fall outside of type of business, e.g., imports by wholesalers of various types.

Of the total of 415 import cases involving trademark rights only, 197 are covered by the business types used in the statistics of the Management and Coordination Agency, and 218 fall outside of those types. There were more cases of imports of trademark rights by companies not covered by the Management and Coordination Agency's business types, such as wholesalers, than there were by companies covered by the types, which tend to be mainly manufacturing enterprises. An examination of individual business types shows that the textiles manufacturing industry accounted for 107 cases, wholesale trade (textiles and clothing) for 63, and the specialist services industry for 48. This indicates that most trademark rights import cases were concentrated among fashion-related enterprises.

Of the total of 287 import cases involving patent rights only, 279 are covered by the business types used in the Management and Coordination Agency's statistics -- an overwhelming 97.2 percent. An breakdown individual business types shows that, among enterprises in the Management and Coordination Agency's business types, the communications and electronics equipment industry accounted for 108 cases, the electrical machinery, equipment and supplies industry for 51 cases, and the precision instruments and manufacturing industry for 23 cases. The prominence of enterprises related to the electrical machinery manufacturing industry is notable.

Of the total of 1,641 import cases involving knowhow only, 1,011 are covered by the business types used in the Management and Coordination Agency's statistics and 630 are not. Among both those industries covered by the business types and those not covered, the top five were as follows: the communications and electronics equipment industry accounted for 368 cases, the wholesale trade (machinery and equipment) for 240 cases, the information services and surveys industry for 182 cases, the electrical machinery, equipment and supplies industry for 130 cases, the transport, communications and the public utilities industry for 98 cases. This variation is due to the effects of the large number of software import cases.

Of the total of 284 import cases involving patent rights and knowhow, 262 are covered by the business types used in the Management and Coordination Agency's statistics and 22 are not. Among both those industries covered by the business types and those not covered, the communications and electronics equipment industry accounted for 75 cases or approximately one-fourth of the total. (See Part 3, Statistical Table 3-14.)

(4) Import Status by Type of Business and Size of Capital

The overall trend was that the greatest number of import cases were concentrated among enterprises with the largest size of capital. However, there were a fairly large number of import cases among companies with a comparatively small size capital as well: 420 cases (13.3 percent) among companies capitalized at 50 million yen or less, and 408 cases (12.9 percent) among companies capitalized at 100 million yen or more but less than 500 million yen.

When all import cases are broken down by business type, the top five are as follows: the communications and electronics equipment industry with 623 cases (19.7 percent), the wholesale trade (machinery and equipment) with 295 cases (9.3 percent), the information services and surveys industry with 346 cases (10.9 percent), the electrical machinery, equipment and supplies industry with 250 cases (7.9 percent), and the general machinery manufacturing industry with 182 cases (5.8 percent) (Table 26).

Of the 623 cases of imports by enterprises in the communications and electronics equipment industry, 349 were by companies capitalized at 50 billion yen or more. Of the 295 cases of imports by enterprises in the wholesale trade (machinery and equipment), 128 were by companies capitalized at 100 million yen or more but less than 500 million yen. Of the 346 cases of imports by enterprises in the information services and surveys industry, 128 were by companies capitalized at 50 million yen or less. Of the 250 cases of imports by enterprises in the electrical machinery, equipment and supplies industry, 205 were by companies capitalized at 50 billion yen or more. Finally, of the 182 cases of imports by

enterprises in the general machinery manufacturing industry, 93 were by companies capitalized at 10 billion yen or more but less than 50 billion yen. This indicates that there tended to be more import cases the larger the size of capital of the company, and fewer cases as the size of capital became lower. However, in non-manufacturing industries there were a large number of import cases by enterprises capitalized at 100 million yen or more but less than 500 million yen. This indicates that technology imports among medium- and small-sized enterprises in the wholesaling and information services industries are quite active. (See Part 3, Statistical Table 3-15.)

**Table 26 Number of Import Cases by Size of Capital and Type of Business
(Top Five in Number of Import Cases)**

Division	Manufacturing			Non-manufacturing	
	Communications and electronics equipment industry	Electrical machinery, equipment and supplies industry	General machinery manufacturing industry	Wholesale trade (machinery and equipment)	Information services and surveys industry
Less than 50 million yen	1 3	0	1 2	5 4	1 2 8
50 million yen to less than 100 million yen	1 3	0	8	2 1	3 3
100 million yen to less than 500 million yen	4 3	4	1 2	1 1 6	7 3
500 million yen to less than 1 billion yen	2 7	0	7	7	6
1 billion yen to less than 5 billion yen	1 7	3	1 9	7 1	7 5
5 billion yen to less than 10 billion yen	4 5	3	1 0	2 0	1 1
10 billion yen to less than 50 billion yen	1 1 6	3 5	9 3	6	1 9
50 billion yen or more	3 4 9	2 0 5	2 1	0	0 (1 unknown case)
Total	6 2 3	2 5 0	1 8 2	2 9 5	3 4 6

(5) Software Import Status by Type of Business

Import status by type of business (1) overall, (2) for software-related cases, and (3) for non-software-related cases is presented in the table below. The top five Industrial Classification entries for each of the above three are listed.

	(1) Total	(2) Software	(3) Other than software
1	Communications and electronics equipment industry	Communications and electronics equipment industry	Communications and electronics equipment industry
2	Information services and surveys industry	Information services and surveys industry	textiles manufacturing industry
3	Wholesale trade (machinery and equipment)	Wholesale trade (machinery and equipment)	Electrical machinery, equipment and supplies industry
4	Electrical machinery, equipment and supplies industry	Electrical machinery, equipment and supplies industry	General machinery manufacturing industry
5	General machinery manufacturing industry	General machinery manufacturing industry	Industrial chemicals and chemical fibers industry

As shown above, such top five entries for overall technology imports and for software-related technology imports match. This shows the significant influence that software imports have on technology imports overall.

1.9 Technology Trade Balance Figures

- Technology Trade Balance Ratio (Receipts/Payments) of 0.64

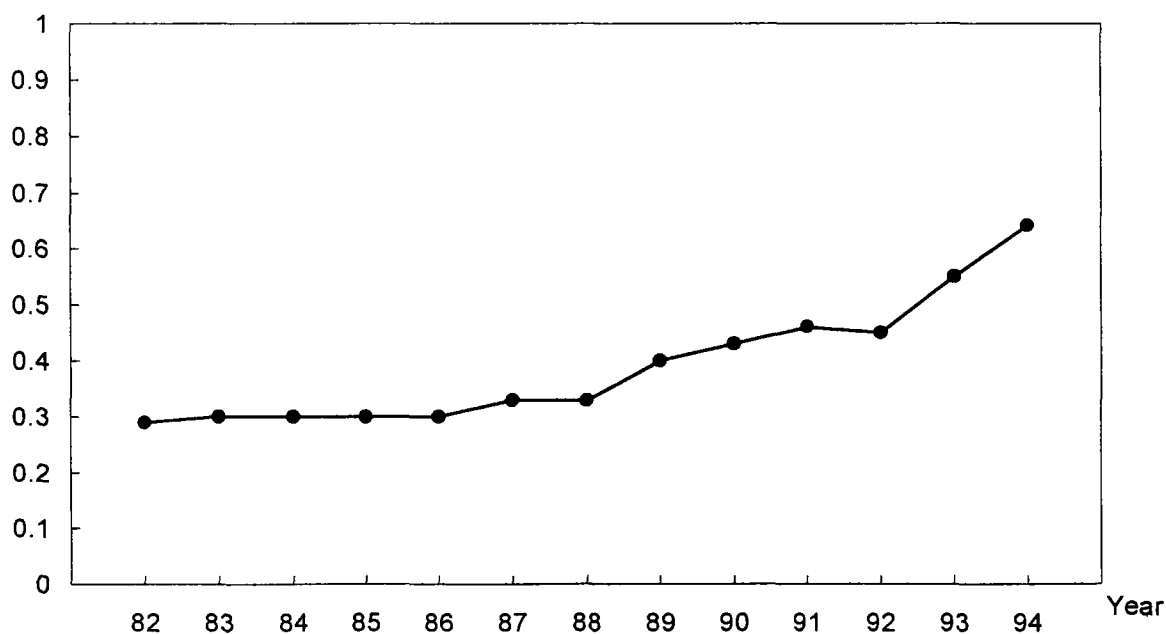
According to a compilation of the figures of the "Balance of Payments Monthly" compiled by the Bank of Japan, the value of payments by Japan for technology imports in fiscal 1994 was \$8 614 billion (up 17.6 percent from the previous year) (Table 27).

On the other hand, the value of receipts for technology exports in fiscal 1994 was \$5.480 billion (up 35.3 percent from the previous year). As a result, the technology trade balance ratio (receipts/payments) for fiscal 1994 was 0.64, a substantial increase of 16.4 percent from the preceding year.

Compared with the figures for 10 years previous (fiscal 1984), the value of payments grew to 370 percent of the 1984 figure, the value of receipts to 790 percent of the 1984 figure, and the technology trade balance ratio to 210 percent of the 1984 figure.

Similarly, compared with the figures for five years previous (fiscal 1989), the value of payments grew to 160 percent of the 1989 figure, the value of receipts to 250 percent of the 1989 figure, and the technology trade balance ratio to 160 percent of the 1989 figure (Figure 16).

Figure 16 Trend of Technology Trade Balance of Japan



Source: "Balance of Payments Monthly" compiled by the Bank of Japan

Table 27 Technology Trade Trends

Fiscal year	Technology trade totals		
	Value of receipts (A)	Value of payments (B)	A/B
	(million dollars)	(million dollars)	
1950	0.0	2.6	—
1951	0.0	6.7	—
1952	0.0	9.9	—
1953	0.1	13.9	0.01
1954	0.4	15.8	0.03
1955	0.2	20.0	0.01
1956	0.3	33.3	0.01
1957	0.2	42.6	0.00
1958	0.7	47.8	0.01
1959	0.8	61.9	0.01
1960	2.3	94.9	0.02
1961	3	113	0.03
1962	7	114	0.06
1963	7	136	0.05
1964	15	156	0.10
1965	17	166	0.10
1966	19	192	0.10
1967	27	239	0.11
1968	34	314	0.11
1969	46	368	0.13
1970	59	433	0.14
1971	60	488	0.12
1972	74	572	0.13
1973	88	715	0.12
1974	113	718	0.16
1975	161	712	0.23
1976	173	846	0.20
1977	233	1027	0.23
1978	274	1241	0.22
1979	342	1260	0.27
1980	378	1439	0.26
1981	537	1711	0.31
1982	527	1796	0.29
1983	624	2079	0.30
1984	693	2317	0.30
1985	746	2522	0.30
1986	1009	3375	0.30
1987	1385	4177	0.33
1988	1681	5076	0.33
1989	2189	5455	0.40
1990	2582	6004	0.43
1991	2984	6493	0.46
1992	3224	7128	0.45
1993	4049	7326	0.55
1994	5480	8614	0.64

[Reference] About Technology Trade Balance Data

With regard to the technology trade balance, the "Report on the Survey of Research and Development" published by the Management and Coordination Agency provides a source of data in addition to that contained in the "Balance of Payments Monthly" by the Bank of Japan. According to the former source, Japan's technology trade figures for fiscal 1994 were as follows: exports worth 462.1 billion yen, imports worth 370.7 billion yen, and a technology trade balance ratio of 1.25

On the other hand, if we use the final monthly average exchange rate for the interbank market (\$1 = ¥99.41) to convert the above-mentioned data from the Bank of Japan for fiscal 1994 into yen, the technology trade balance ratio becomes a mere 0.64. There is clearly a big gap between the Bank of Japan's data and the Management and Coordination Agency's data.

This is because the goals of the two surveys are different. Whereas the main point of the Bank of Japan's statistics is the control of the foreign exchange rate, the Management and Coordination Agency's statistics aim to show the actual state of R&D activity in Japan. This means that the survey methods they employ and the scope of their surveys are different. (Refer to Table 28 for a summary of the main points of difference between the two sets of statistics.)

This gap in the technology trade and balance ratio figures given in the two sets of statistics has been examined in detail in "Statistics of Japan's Trade in Technology -- Quantitative Analysis Approach" (National Institute of Science and Technology Policy Publication No. 26 (1993)(Note)). It establishes the range of technology trade that needs to be covered in order more accurately to gauge the extent and technology transfers and flows between Japan and other countries, and proposes a method for quantitative analysis, based on three causes underlying the divergence in the two above-mentioned sets of statistics. Calculations based on the application of this method allow us to estimate a technology trade balance ratio of about 0.85 for fiscal 1994.

- This trade balance data is reprinted from the calculations of the Third Policy-Oriented Research Group of the National Institute of Science and Technology Policy.

(Note) The above-mentioned report points out three causes underlying the divergence in the two sets of statistics. The results of the trial calculations it contains (fiscal 1994) are as follows:

- | |
|---|
| (1) "The Management and Coordination Agency's statistics do not cover the following industries: wholesaling, retailing, food-related, banking, insurance, real estate, and service-related."
Trial calculation results: 180.1 billion yen should be added to the value of technology imports in the Management and Coordination Agency's statistics. |
| (2) "The Bank of Japan's statistics do not cover the cost of knowhow and manufacturing-related technical consultation accompanying plant exports."
Trial calculation results: 35.6 billion yen should be added to the value of technology exports in the Bank of Japan's statistics. |
| (3) "The Bank of Japan's statistics include the cost of assignment and usage rights with regard to trademarks."
Trial calculation results: 179.6 billion yen should be subtracted from the value of technology imports in the Bank of Japan's statistics. |

[Trial Calculation Method for the Three Causes]

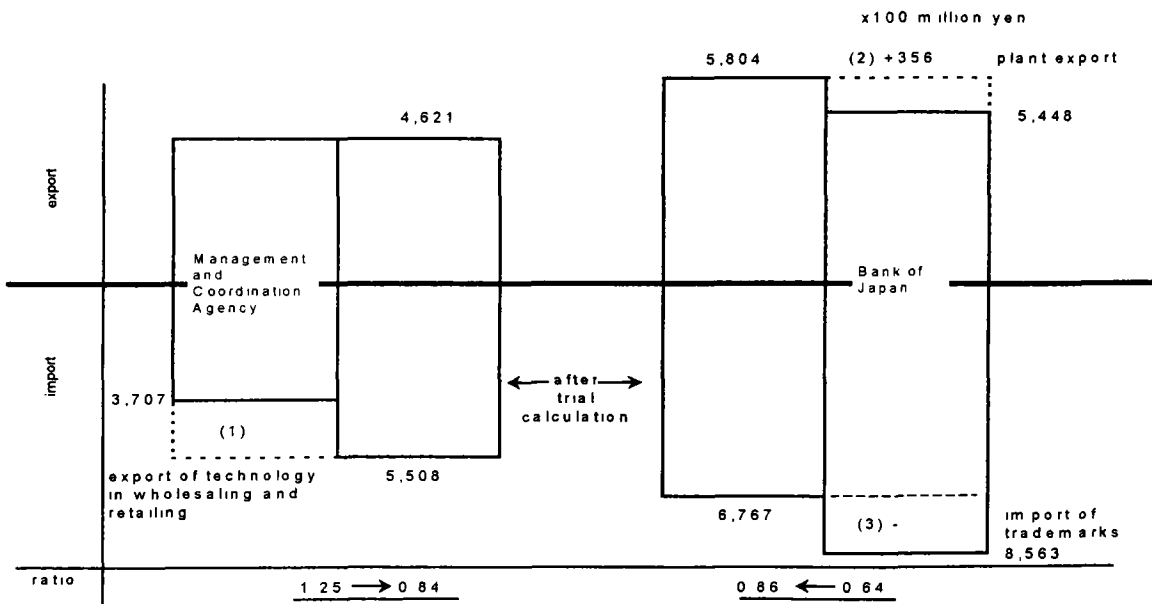
- (1) Calculations were made based on a share of 32.7 percent for new technology import cases by enterprises in the wholesaling and retailing industries of all such cases by all industries.
 (In fiscal 1994, new technology import cases by enterprises in the wholesaling and retailing industries accounted for 1,033 cases out of a total of 3,161 such cases for all industries.)

Industries covered by the Management and Coordination Agency's statistics 67.3% (Value of imports: 370.7 billion yen)	Industries not covered by the Management and Coordination Agency's statistics 32.7%
---	--

[370.7 billion ÷ 0.673 × 0.327 '= 180.1 billion]

- (2) Calculations were made based on a the constituent cost of "engineering" of 2.3 percent of the value of plant export contracts. However, since statistics on plant export contracts are based on contract signings, the actual payments are delayed by about three years. As such, the value of such exports for fiscal 1991 (1,546.2 billion yen) was used for the trial calculations for 1994.
 [1,546.2 billion × 0.023 '= 35.6 billion]
- (3) This was calculated using the average unit cost of a trademark (43 million yen/case) and the number of trademark contracts (4,176). Also, the number of contracts was obtained by multiplying the number of new technology import cases involving trademarks (949) by the average number of years duration of trademark contracts (4.4 years/case in fiscal 1994).
 [43 million × 4,176 cases '= 179.6 billion]

Technology Trade Balance Trial Calculation Results -- Fiscal 1994



(Most recent corrected intermediate values)
 Fiscal 1990: 0.56, fiscal 1991: 0.58, fiscal 1992: 0.57, fiscal 1993: 0.73

Table 28 Main Points of Difference Between the Two Sets of Statistics

	Bank of Japan (Balance of Payments Statistics)	Statistical Bureau, General Affairs Agency, "Report on the Survey of Research and Development"
Survey method	Compilation of non-trade receipt (payment) reports submitted to the Bank of Japan when foreign currency is transferred or deposited	Mailed questionnaire (1) Exhaustive survey (enterprises capitalized at 1 billion yen or more; enterprises capitalized at less than 1 billion yen that indicated on previous year's survey that they performed R&D) (2) Selective survey (enterprises capitalized at less than 1 billion yen)
Range covered by survey	Parties (individuals, corporations, the country) that have concluded non-trade contracts with non-residents (individuals and corporations from outside Japan)	Private enterprises capitalized at 50 billion yen or more
Not covered by survey	None	(1) Wholesale, retail, and service industries (2) Private enterprises capitalized at less than 50 billion yen (3) Universities, research institutions (national, public, private), special corporations and individuals specializing in research
Statistical values covered	Numeric value entered for "fees for use of patent rights, etc." among the international trade balance items on the non-trade receipt (payment) report.	Figures entered in the "technology exports" and "technology imports" columns of the survey questionnaire form
Range of technology trade	(1) Specification of assignment and usage rights related to industrial property rights (patents, practical models, designs, trademarks) and knowhow (2) Technical consultation in plant management and technical consultation in business management (3) Items related to plant export are excluded.	(1) Supply and receipt of patents, practical models, knowhow, technical consultation, etc. (2) Trademarks and designs are excluded. (3) Technical consultation in plant management and technical consultation in business management are excluded.

Part 2 Analysis of Trends by Technology Format

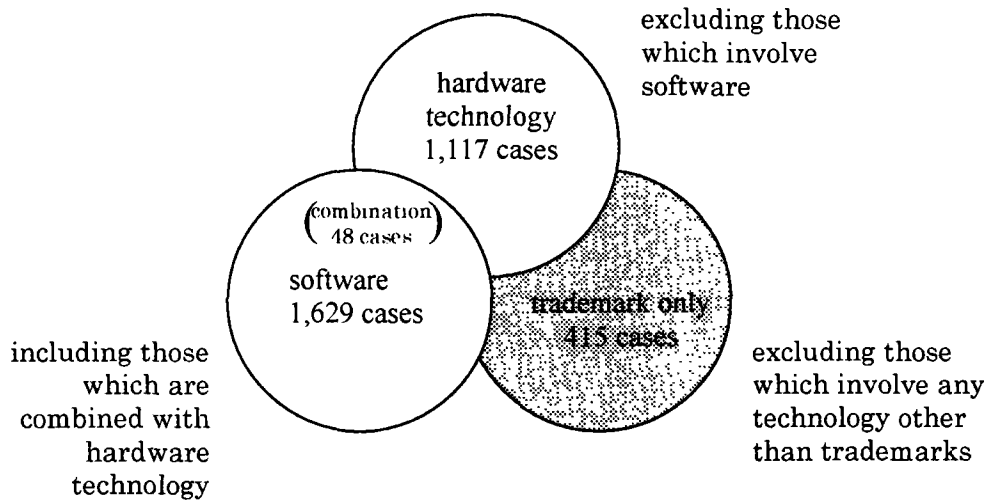
2.1 Technology Format

(1) Technology Format Categories

In Part 1 of this report, software was analyzed as an advanced science and technology field. For our analysis in Part 2, all technologies that have any connection at all with software will be classified as "software," cases in which nothing but trademark rights are involved will be classified as "trademark only," and cases not falling into the first two categories will be classified as "hardware technology."

We will refer to the categories used in this method of classification as "technology format categories" (Figure 1).

Figure 1 Technology Format Categories (Total Cases: 3,161)



Note that in fiscal 1994 there were 48 "hardware technology" cases that "include software." These cases were classified in the "software" category.

In the pages that follow, we have attempted to analyze from a variety of angles technology imports by "technology format category" from fiscal 1989 onward.

(2) Share of Imports by Technology Format

A breakdown of technology imports in fiscal 1994 by "technology format category" shows that "software" accounted for 52 percent of the total, "hardware technology" for 35 percent, and "trademark only" for 13 percent (Figure 2).

However, a comparison of the figures for 1985 and before with those for fiscal 1994 indicates that there were large increases in the number of cases in both the "software" and "trademark only" categories (Figure 3).

This is due to the fact that through fiscal 1980, "technology imports" consisted almost entirely of "hardware technology." In recent years, however, the share of the total accounted for by technology imports involving software or trademarks has been increasing.

Figure 2 Share of Imports by Technology Format

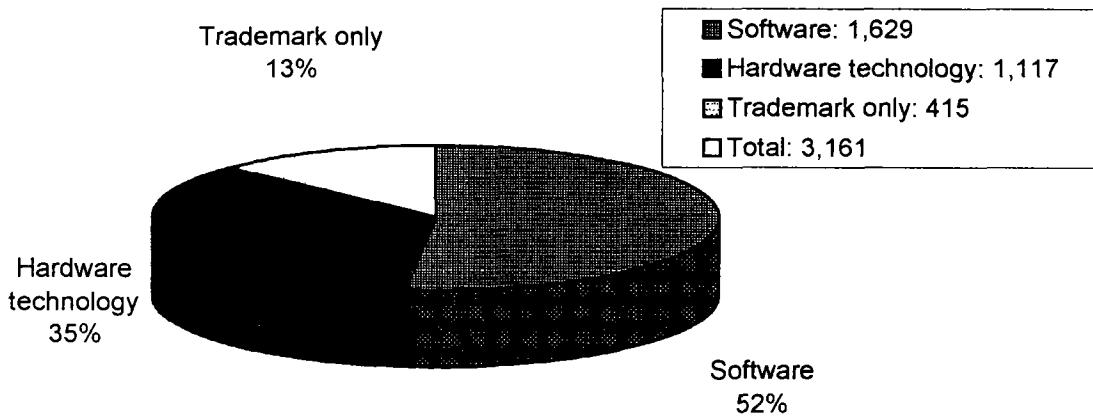
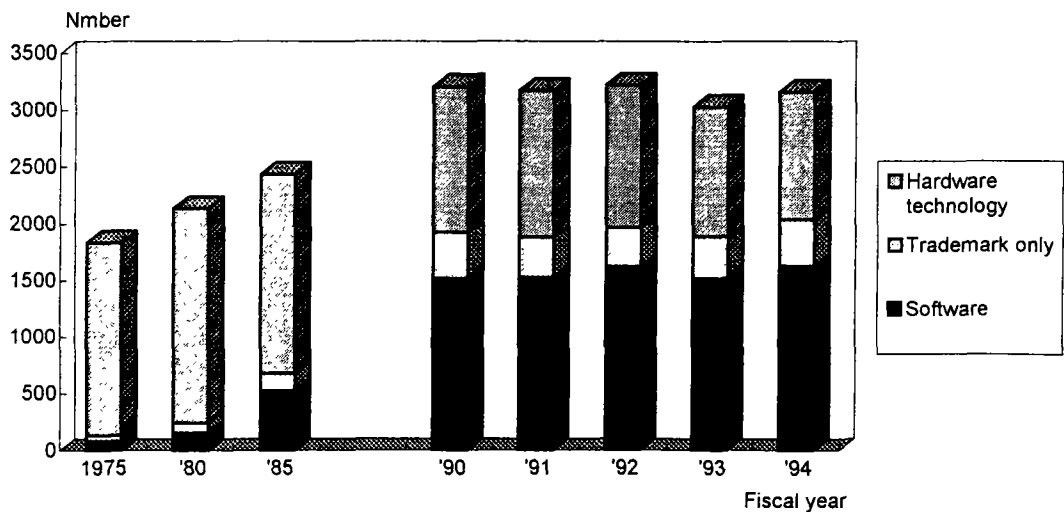


Figure 3 Trend in Number of Import Cases



(3) Technology Format and Technology Classification

A closer look at the Technology classification shows that most of the "software" imports were accounted for by the "electronic computers".

Among "hardware technology" imports, many were accounted for by the "electronic parts and devices", while others were dispersed among all the other Technology Classification entries.

Most "trademark only" were accounted for by the "outer garment" and "textiles" entries.

(4) Technology Formats and Technology Type

Among "hardware technology" imports, the largest share was accounted for by knowhow transfers, but there were also many cases involving patents and trademarks. In contrast to the "software" Technology Format, there were many cases involving multiple "Technology Types" (40.7 percent of "hardware technology" were of this type). Almost all "software" cases involved "knowhow only," though there were a handful of cases also including patent or trademark rights (Table 1).

Figure 4 Shares of Principal Technology Type by Technology Format

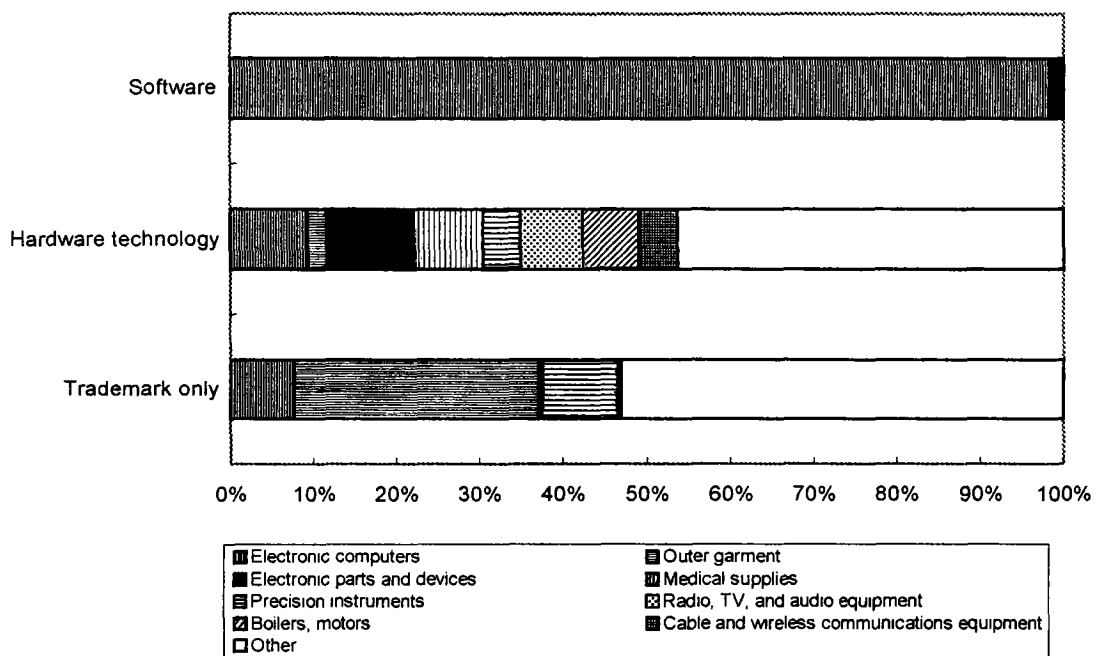


Table 1 Technology Format and Technology Type

Technology Format	Hardware technology	Software	Trademark only	Total
Patent only	277(24.8%)	10(0.6%)	0(0.0%)	287(9.1%)
Knowhow only	385(34.5%)	1,256(77.1%)	0(0.0%)	1,641(51.9%)
Trademark only	0(0.0%)	0(0.0%)	415(100.0%)	415(13.1%)
Patent + knowhow	266(23.8%)	18(1.1%)	0(0.0%)	284(9.0%)
Patent + trademark	8(0.7%)	0(0.0%)	0(0.0%)	8(0.3%)
Knowhow + trademark	96(8.6%)	315(19.3%)	0(0.0%)	411(13.0%)
Patent + knowhow + trademark	85(7.6%)	30(1.8%)	0(0.0%)	115(3.6%)
Total	1,117(100.0%)	1,629(100.0%)	415(100.0%)	3,161(100.0%)

Table 2 Number of Import Cases by Technology Format and Technology Classification

Technology Classification	Total	Hardware technology	Software	Trademark only
All industries	3,161	1,117	1,629 (48)	415
Agriculture, forestry, and fisheries	3	3		
Mining	1	1		
Construction,	10	10		
Manufacturing	3,112	1,091	1,628 (47)	393
Food and tobacco	27	12		15
Textiles	59	3		56
Clothing and textile products	193	28		165
Outer garment	148	26		122
Miscellaneous fabricated textile products	45	2		43
Lumber, wood products, and furniture	8	6		2
Wood pulp, paper products, and printing	10	5		5
Chemical products	175	163		12
Inorganic chemicals, etc.	6	4		2
Organic chemicals	30	30		
Chemical fibers	3	3		
Oil and fat products, etc.	5	5		
Drugs and medicines	95	93		2
Other chemical products	36	28		8
Petroleum and coal products	5	5		
Rubber products	4	2		2
Tanned leather, leather goods, and furs	32	7		25
Ceramics	28	26		2
Iron and steel	12	12		
Non-ferrous metals	10	10		
Fabricated metal products	20	18		2
General machinery	231	224	4 (4)	3
Boilers, engines and turbines	75	75		
Machinery and equipment for agriculture, construction and mining	7	7		
Metal working machinery	9	9		

Technology Classification	Technology Format	Total	Hardware technology	Software	Trademark only
Textile machinery		1	1		
Machinery for special industries		36	34	1 (1)	1
General industrial machinery and equipment		81	78	2 (2)	1
Pumps, compressors, fans		10	10		
Power machinery		10	9		1
Chemical machinery and devices		54	52	2 (2)	
Other general industrial machinery and equipment		7	7		
		22	20	1 (1)	1
Other machinery and equipment		33	31		2
Transportation equipment		90	51	2 (2)	37
Precision instruments		2,092	434	1,622 (41)	36
Electrical machinery tools		12	12		
Electrical generating, transmission, distribution and industrial apparatus		7	6		1
Household electric appliances, electric bulbs and lighting fixtures		144	134	8 (8)	2
Communication equipment		59	52	5 (5)	2
Cable and wireless communication equipment		85	82	3 (3)	
Radio, TV, and audio equipment					
Other communication equipment		1,795	156	1,606 (25)	33
Electronic equipment		1,740	104	1,604 (23)	32
Electronic computers		55	52	2 (2)	1
Other electronic devices		125	117	8 (8)	
Electronic parts and equipment		9	9		
Other electrical equipment		83	54		29
Other products		5	2		3
Precious metal products, costume jewelry, etc.		22	8		14
Leisure goods		41	36		5
Plastic products		15	8		7
Manufacturing industries, not elsewhere classified		35	12	1 (1)	22
Other industries					

Note: Figures in parentheses () represent cases where "hardware technology" and "software" overlap. They are included in the figures immediately to the left of them. Totals are greater than the actual total number of cases due to overlaps.

2.2 Trends in Number of Technology Import Contracts

(1) Trends in Number of Import Cases by Technology Format

Over the long term, "hardware technology" imports are decreasing. Since fiscal 1989, the numbers have gradually grown smaller.

Since fiscal 1971, when statistics for "software" started to be kept, imports have risen constantly. This increase was quite rapid through fiscal 1990. Then, beginning fiscal 1991 there was no growth, followed by a decrease in fiscal 1993. Then the figures grew again in fiscal 1994. However, the increase is especially prominent in software accompanying trademark imports.

Over the long term, "trademark only" imports are increasing. However, there have been some individual years where a decrease occurred after 1989. After decreases in fiscal 1991 and 1992, the figures increased in 1993 and again in 1994 (Figure 5) (Figure 3).

(2) Trends in Number of Import Cases by Technology Classification

In the "hardware technology" format, an examination of the trends in the major Technology Classification entries from fiscal 1989 onward shows a downward trend for "drugs and medicines," beginning in 1989. "Electronic parts and devices" peaked in 1991 and then experienced a continuous decline. On the other hand, the downward trend in "electronic computers" halted in fiscal 1994. However, the technology categories in "hardware technology" format experienced an overall downward trend from fiscal 1992 onward.

Looking at the major upward and downward trends in the "trademark only" format, though there were no big changes up to fiscal 1991, "electronic computers" posted a rapid increase between fiscal 1992 and fiscal 1993, followed by a big drop in fiscal 1994. In contrast, "outer garment" had been on a slight downward trend through fiscal 1993, but then experienced a sudden increase in fiscal 1994 (Figure 7).

Figure 5 Number of Import Cases by Technology Format

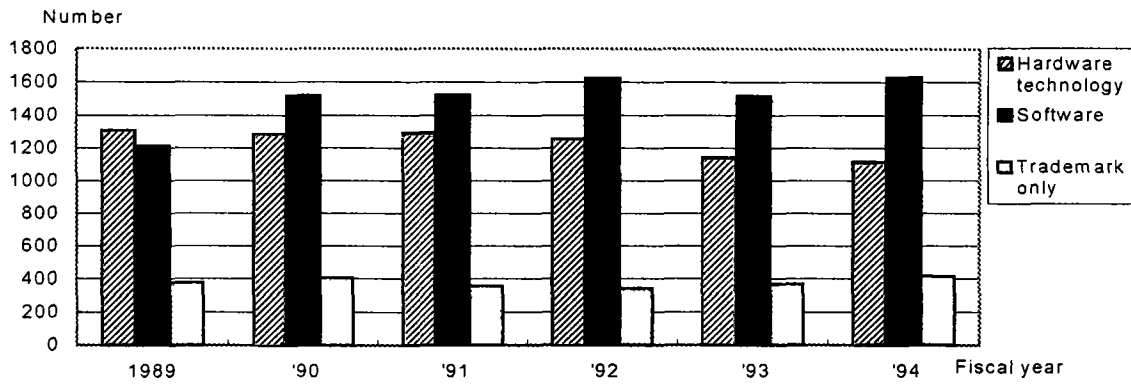


Figure 6 Trend in Number of Import Cases for Major Technology Classification Entries (Hardware Technology)

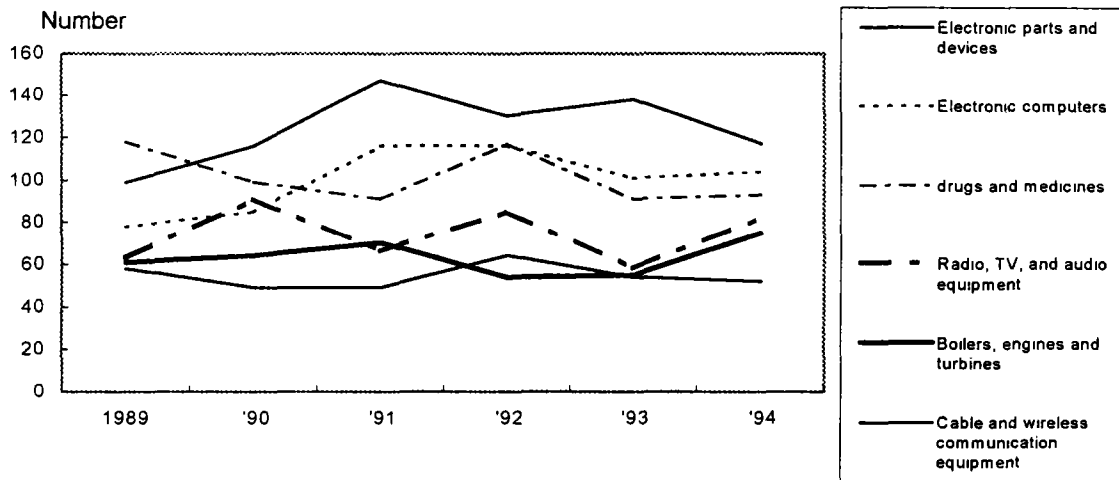
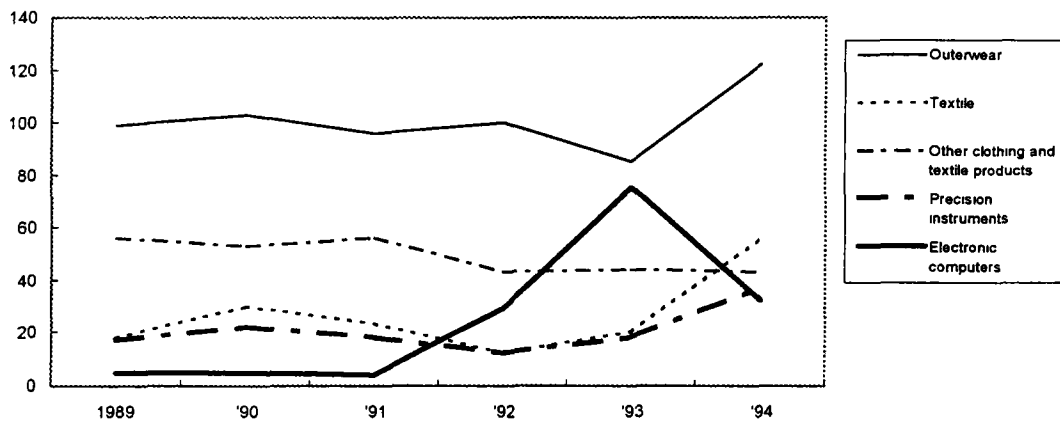


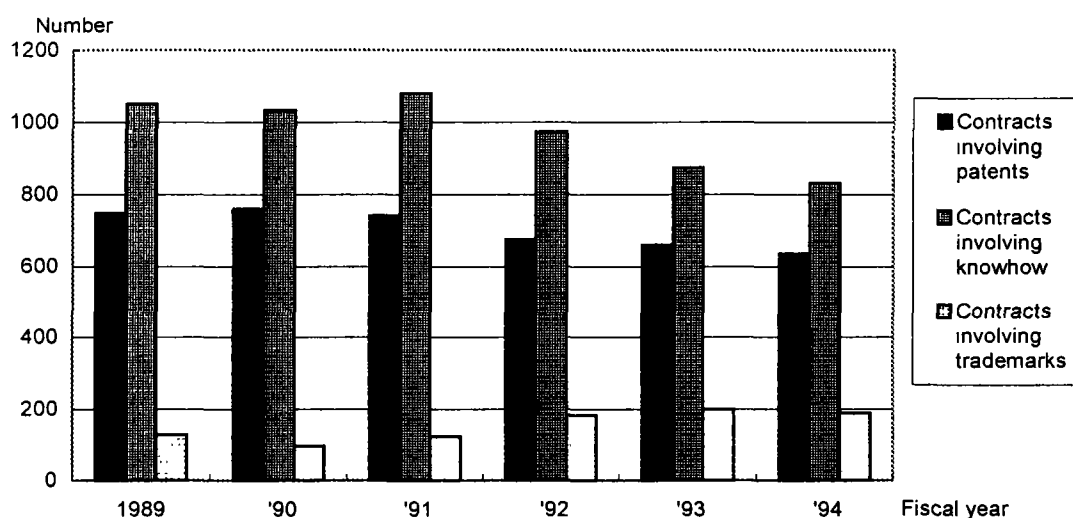
Figure 7 Trend in Number of Import Cases for Major Technology Classification entries (Trademark Only)



(3) Trends in Number of Import Cases by Technology Type

In the "hardware technology" format, the decline in the number of "knowhow" and "patent" import cases is notable. Both technologies have dropped noticeably since fiscal 1992. "Trademark" cases declined in 1990, then began to increase again in fiscal 1991. There was then a slight drop in fiscal 1994 (Figure 8).

Figure 8 Trends in Number of Import Cases by Technology Type (Hardware Technology)



In the "hardware technology" format, a comparison with fiscal 1989 of the trends of the major Technology Classification entries, broken down by Technology Type shows that under "knowhow," "drugs and medicines" decreased while the entries such as "electronic parts and devices" and "electronic computers" grew. Under "patents," "drugs and medicines" was down a significant 46 percent from the level five years previous, and "cable and wireless communication equipment" also declined. In contrast, "electronic parts and devices," "electronic computers," and "radio, TV, and audio equipment" all showed an overall gain, though there were some fluctuations along the way (Figure 9).

"Software" was accounted for almost entirely by the Technology Type "knowhow," though there were a handful of "patent" and "trademark" cases. Though these numbers are still small, "patent" and "trademark" cases are on an upward trend. Since fiscal 1992, the increase in the number of "trademark" imports has been especially notable (Figure 10).

Figure 9 Trends in Knowhow and Patents (Hardware Technology)

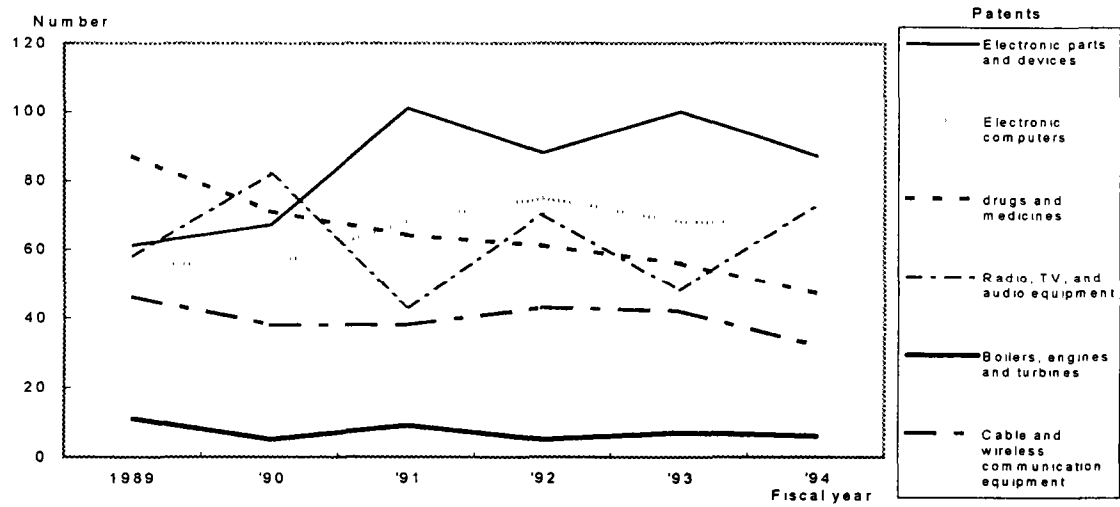
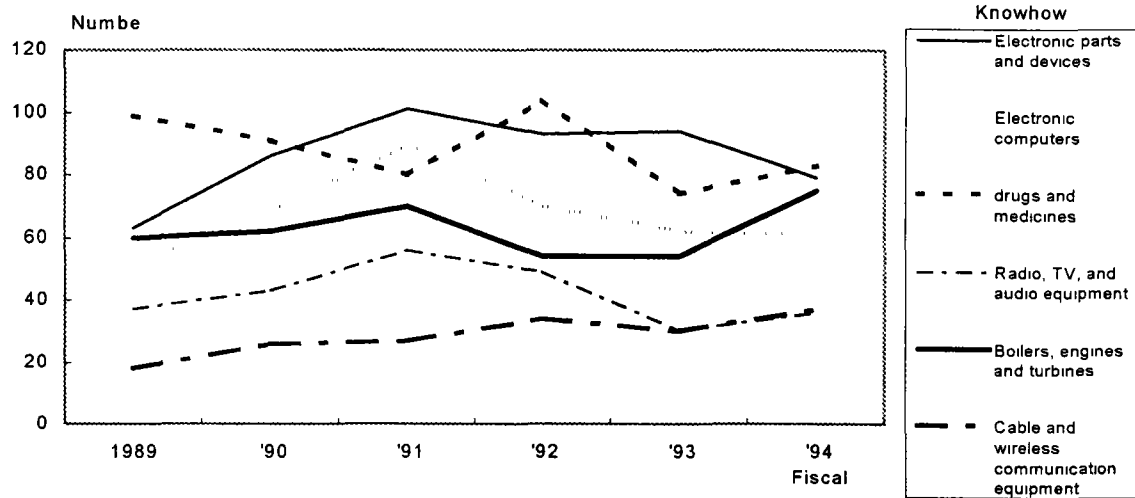
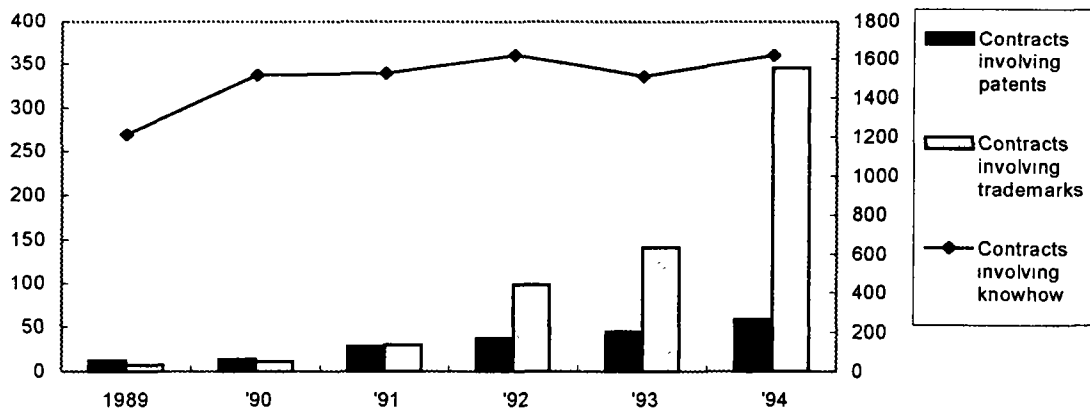
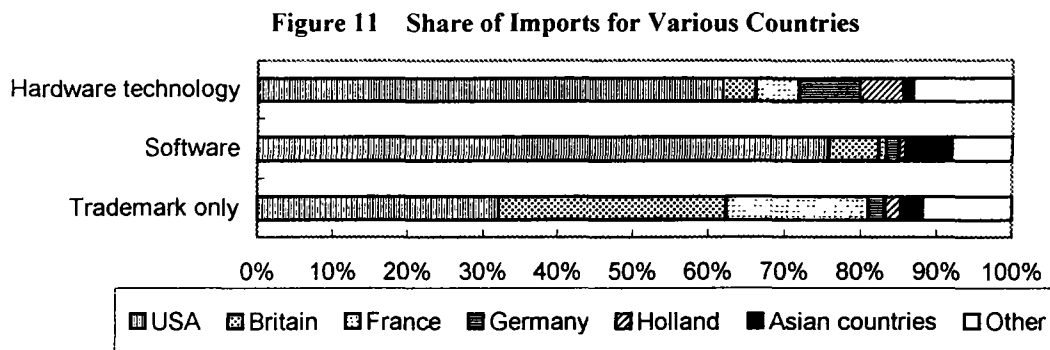


Figure 10 Trends in Number of Import Cases by Technology Type (Software)



(4) Trends in Number of Import Cases by Country of Origin

Here we examine the share of imports accounted for by the major countries of origin, broken down by "Technology Format." In all formats, the United States accounted for the majority of imports. As for other countries, the number of import cases from Britain was relatively steady for all formats. Import cases from Germany were dominated by "hardware technology," those from France by "trademark only," and those from Holland by "hardware technology." Import cases from Asian countries were dominated by "software" (Figure 11).

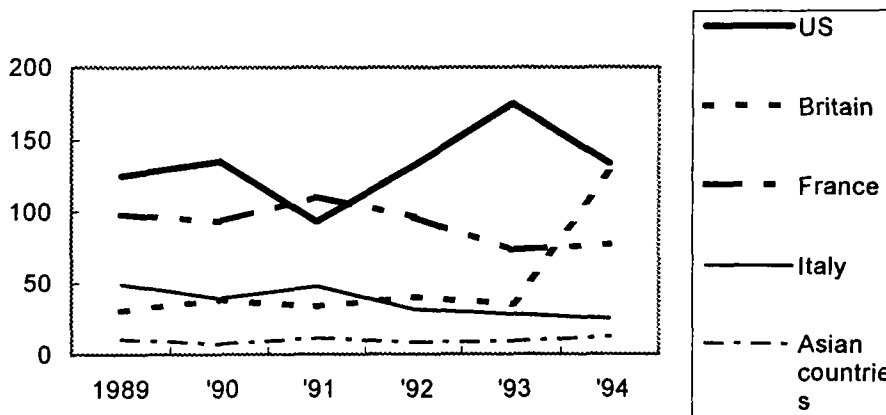
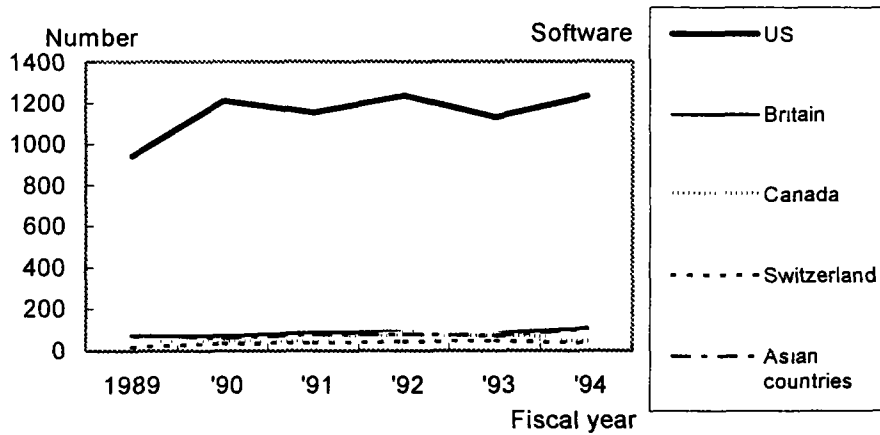
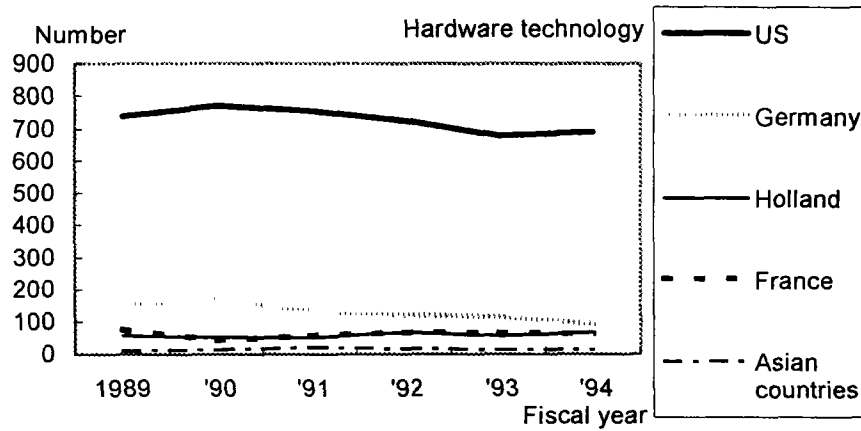


From fiscal 1989 onward, "hardware technology" import cases have been declining for all countries except Holland and Asian countries. The decline in fiscal 1990 in the case of France is particularly notable. Among specific Technology Classification entries, the decline in "transportation equipment" import cases from the United States, and the drop since fiscal 1990 in "outer garment" import cases from France are prominent. While the overall number of "hardware technology" import cases has declined, the share accounted for by the United States has risen from 57 percent in 1989 to 62 percent in 1994 (Figure 12).

For "software," the United States share is overwhelming. While there has been a small increase in the share accounted for by all other countries (22 percent in 1989 to 24 percent in 1994), some of these cases are actually imports from companies tied to American enterprises (Figure 12).

As for "trademark only" import cases, these are on the increase in the case of the United States and Britain, and decreasing in the case of France and Italy. "Trademark only" imports from the United States are increasing in the "electronic computers", while those from Britain are increasing in the "textiles" and "outer garment". Imports from France and Italy are decreasing in the "outer garment" and "tanned leather goods". Among "trademark only" imports, the upward trend in "electronic computers" is strong, so it seems likely that the US share of the "trademark only" format will continue to grow (Figure 12).

Figure 12 Trends in Number of Import Cases from Principal Countries of Origin by Technology Import Format



2.3 Characteristics of Import Contracts

(1) Payment Conditions

When it comes to payment conditions, "initial payment" is the most numerous among "software" import contracts, while "running royalties" are the most common among "trademark only" import contracts. The situation of "hardware technology" import contracts is somewhere between that of "software" and "trademark only." However, the share of "initial payment plus running royalties" is higher for "hardware technology" than for the other technology formats (Figure 13).

Among "hardware technology" import contracts, there is a roughly equal share of "initial payment," "initial payment plus running royalties," and "running royalties only" payment conditions. This indicates that different payment conditions are used to match a variety of import goals (Figure 13). Also, when we examined the main technology types among "hardware technology" import contracts on the assumption that there might be varying trends among different types, we found a light percentage of "initial payment only" contracts for "boilers, engines and turbines," while "running royalties only" contracts were well represented in the "radio, TV, and audio equipment" field. "Electronic parts and devices," even though classified as "hardware technology," has a high percentage of "running royalties only" contracts, which is very similar to the situation for the "trademark only" technology format. The difference between the situation of "electronic parts and devices" and "trademark only" is that the former also has a large percentage of "initial payment plus running royalties" contracts (Figure 14).

The share of "initial payment only" contracts is especially high in the "software". One reason for this may be that "software" is generally used as is by one's own company (Figure 13). However, among the "initial payment only" contracts, there are many cases where the payment is actually seen as a pre-payment of "running royalties" or cases in which an enterprise is importing "software" on behalf of a third party and therefore agrees to "initial payment only" payment conditions. The payment conditions of "software" import contracts are becoming more complex.

Also, "software" has a very low reproduction cost. There are some cases of very high "running royalties" when an enterprise obtains "reproduction rights" and then intends to make copies of the product. In such cases, the cost of using the technology is very different from the cost of using "hardware technology," and it constitutes a large portion of the cost price of the finished product.

The share of "running royalties plus minimum payment" contracts is high in the "trademark only" (Figure 13). Since the trademark is attached to the product, the main portion of the compensation is in the form of "running royalties" proportional to the sales volume. In addition, there is a trend among the rights holder to also require a "minimum payment" in order to guarantee a certain level of return.

Figure 13 Payment Conditions by Technology Format

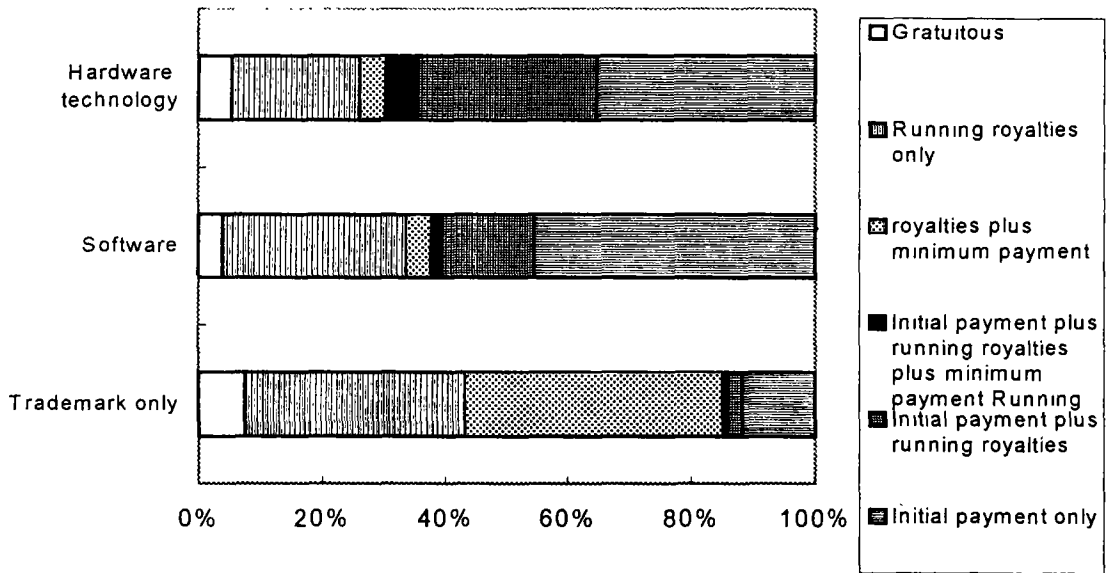
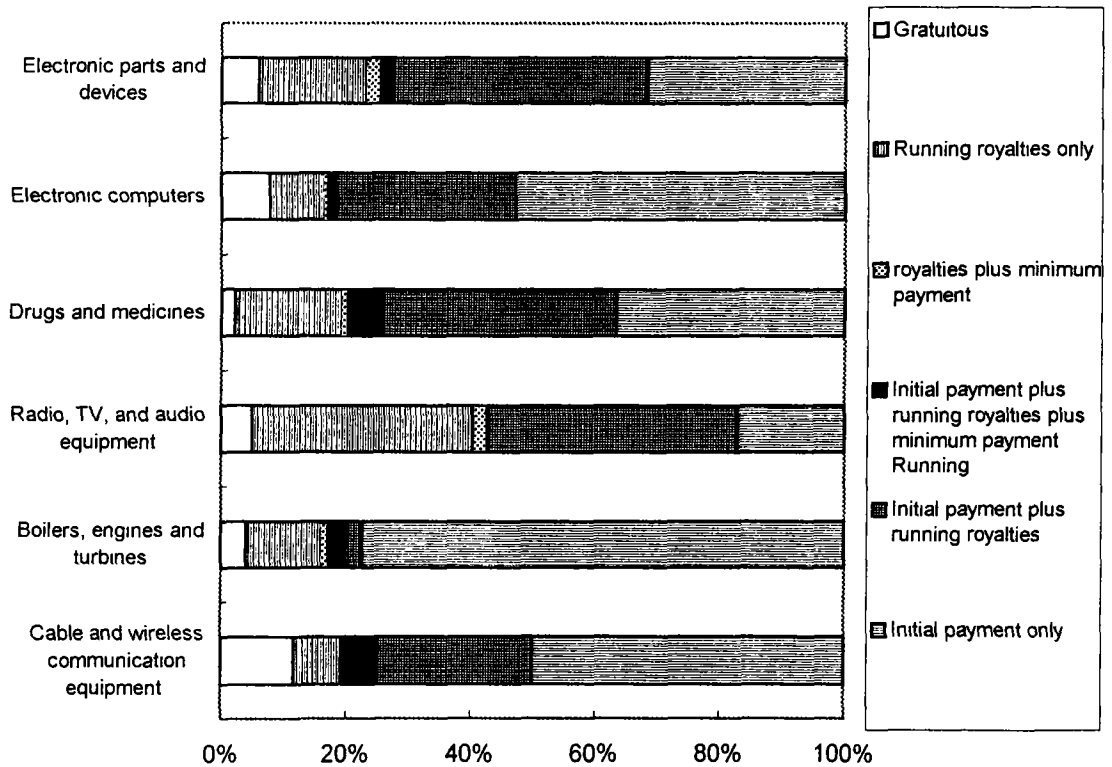


Figure 14 Payment Conditions among Major Technology Classification Entries (Hardware Technology)



Next we will examine trends in payment conditions by the "Technology Formats" (Figure 15).

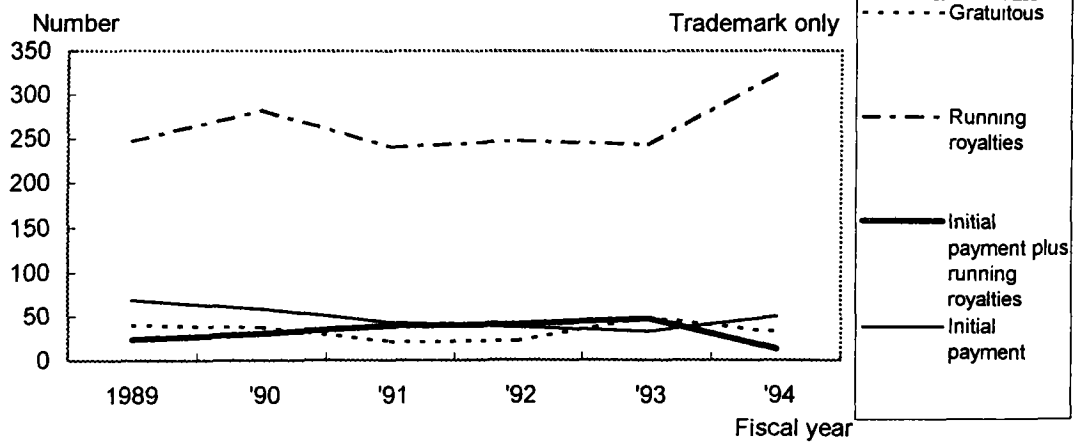
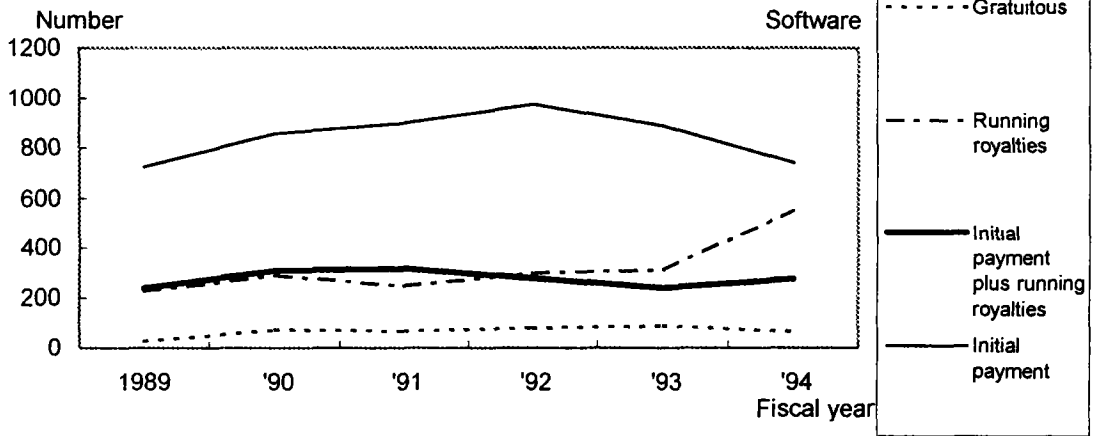
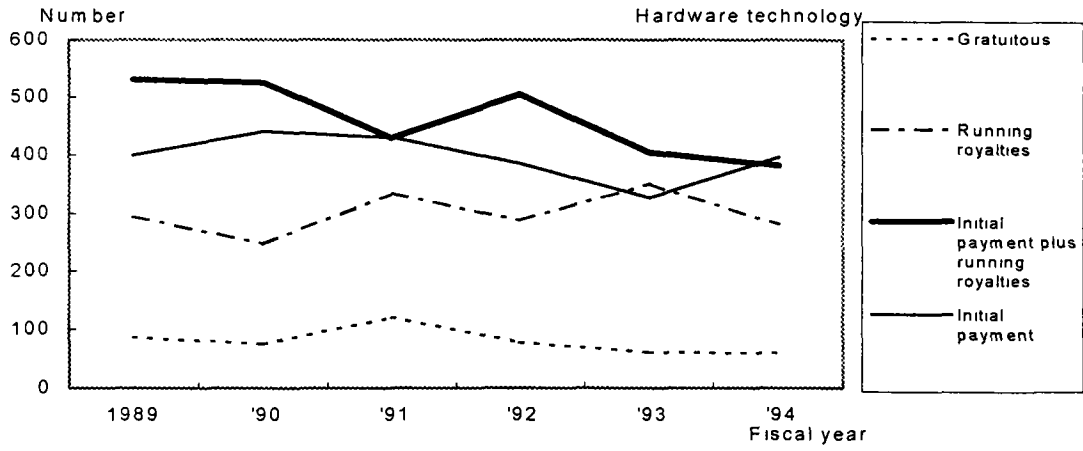
In the "hardware technology", a large number of contracts involved an "initial payment," though a downward trend was evident. "Initial payment only" contracts increased to a level slightly higher than that in fiscal 1992. The drop in contracts involving an "initial payment" was seen in Technology Classification such as "chemical machinery and devices," "electronic parts and devices," and "transportation equipment." Contracts involving both "running royalties" and an "initial payment" showed a downward trend.

In the "software", there was no change in the trend toward an increasing number of "initial payment only" contracts.

And in the "trademark only", "running royalties only" contracts continue to increase.

Note: The statistics for trends in payment conditions do not treat "minimum payment" conditions as a separate category. Contracts specifying such conditions are included in the figures for "running royalties" and "initial payment plus running royalties."

Figure 15 Trends in Payment Conditions



We also examined the royalty rates of contracts involving "running royalties" (Figure 16)

In the "hardware technology", almost 60 percent of contracts specify a royalty rate, and the rates specified are mostly lower than those for the other technology formats.

In the "software", many of the contracts specify a royalty rate, but these are largely unit-price-based (a fixed payment is due for each unit sold). In cases where a royalty rate is specified, it is generally high. (Of the import contracts in fiscal 1994 with a set royalty rate, 42 percent had running royalties of 50 percent or more and 26 percent had running royalties of 30 percent or more but less than 50 percent.) Running royalties in the "software" format seem to consist mainly of unit-price-based royalties and high-rate royalties.

In the "trademark only", contracts with set rate "running royalties" were common. The royalty rates were comparatively high. (Of the import contracts in fiscal 1994 with a set royalty rate, 52 percent had running royalties of 5 percent or more but less than 10 percent.)

Now let us consider the trend in running royalty rates (Figure 17).

In the "hardware technology", royalty rates were decreasing as the number of cases with rates of 5 percent or greater shrank.

In the "software", the "other" classification (chiefly unit-price-based royalties) grew rapidly since fiscal 1990, and high-rate running royalties were also on an upward trend.

In the "trademark only", high-rate running royalties decreased, while contracts with "other" rates increased.

Figure 16 Running Royalty Rates

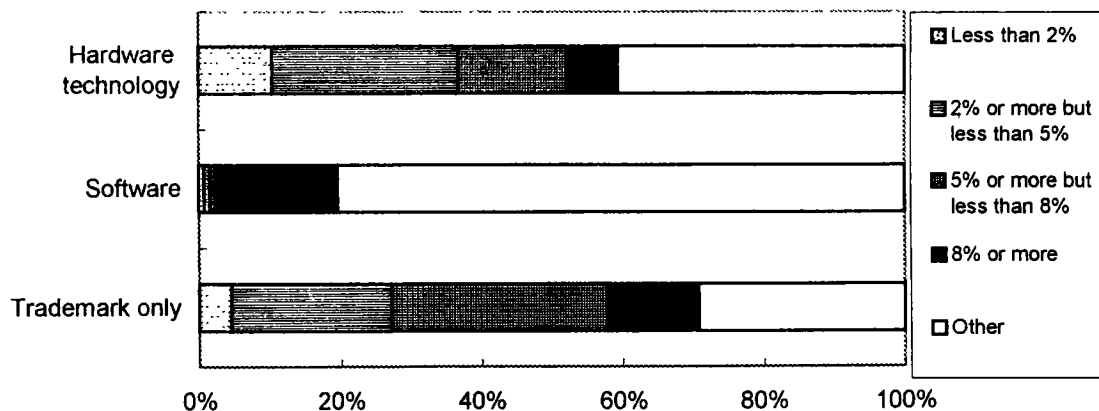
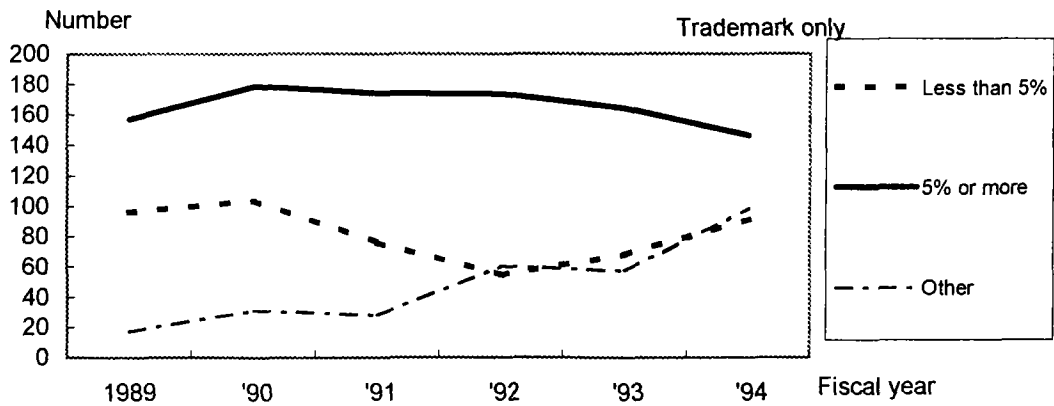
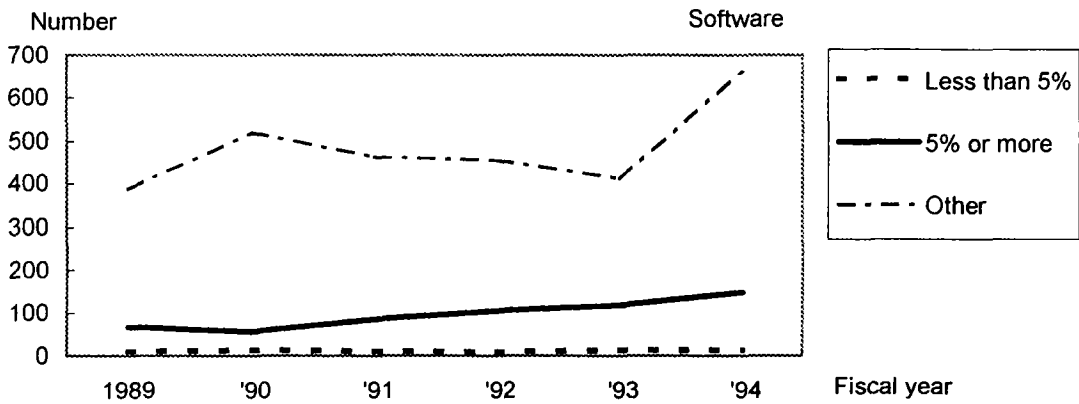
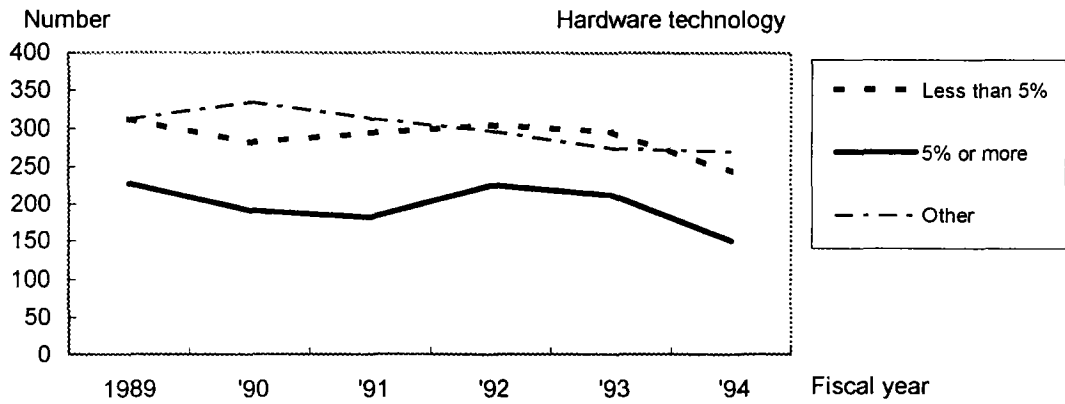


Figure 17 Trends in Running Royalty Rates Cases



(2) Right Acquisition Characteristics

Technology import contracts specify rights as either exclusive rights or renewal rights.

In the "hardware technology" and "software", about 50 percent of contracts involved the acquisition of rights. In the case of "hardware technology," the numbers were about equal for "exclusive rights" and "renewal rights." In the "software", there were nearly twice as many cases of "renewal rights" acquisition as there were of "exclusive rights" acquisition (41.4 percent and 23.3 percent, respectively). In the "trademark only", about 60 percent of contracts involved the acquisition of rights, and most of these cases involves the acquisition of "exclusive rights."

Now we will examine the trends in right acquisition broken down by "technology format" (Figure 19).

In the "hardware technology", there were more cases involving "exclusive rights" than those involving "renewal rights." However, "exclusive rights" contracts have been decreasing gradually since fiscal 1989, and they have been at near parity with the number of "renewal rights" contracts since fiscal 1990. Since fiscal 1990, there has been a decline in the number of "exclusive rights" contracts in Technology Classification such as "transportation equipment", but in none has the decline been rapid.

In the "software", "exclusive rights" contracts were comparatively more numerous than "renewal rights" contracts, but the latter have been increasing since fiscal 1993.

In the "trademark only", the trend in right acquisition has shown little change since fiscal 1989.

Figure 18 Right Acquisition

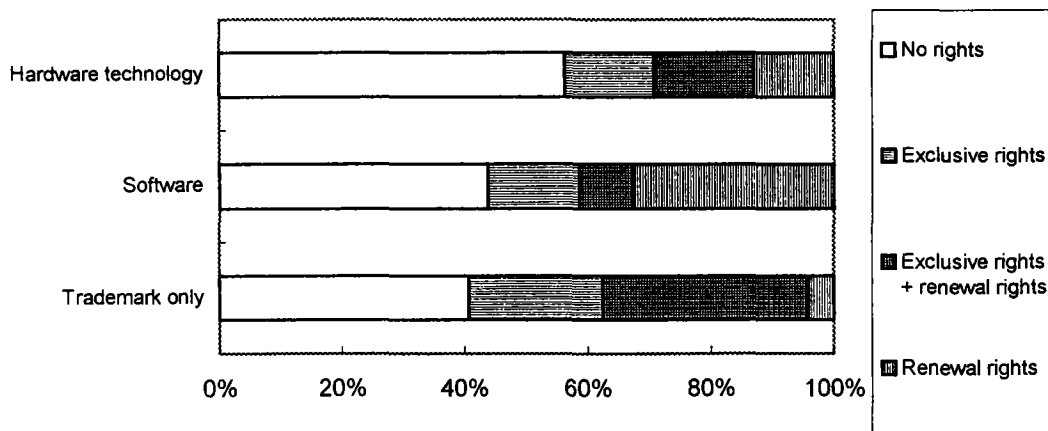
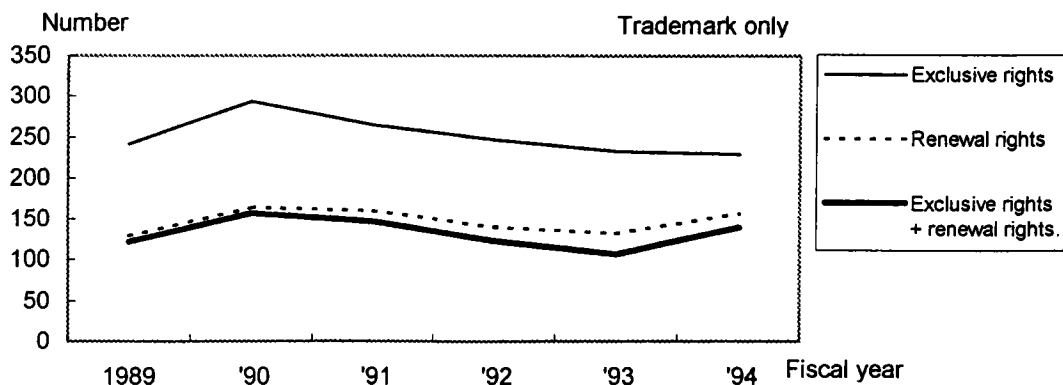
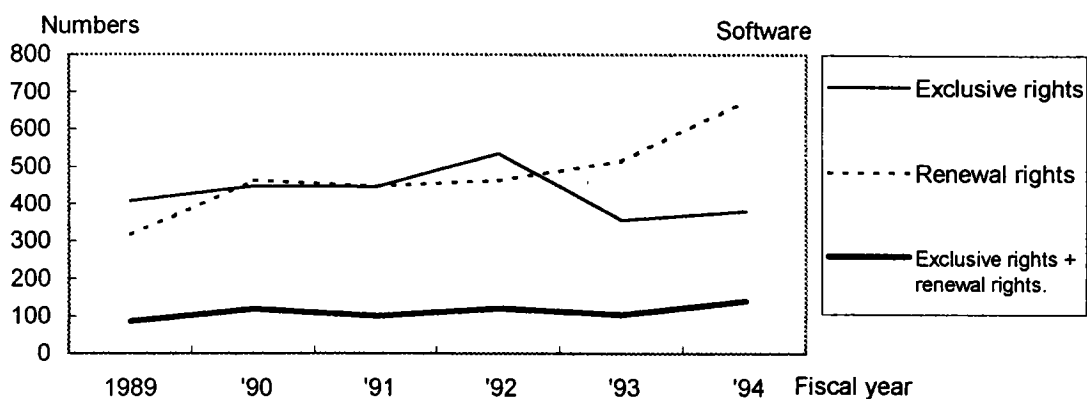
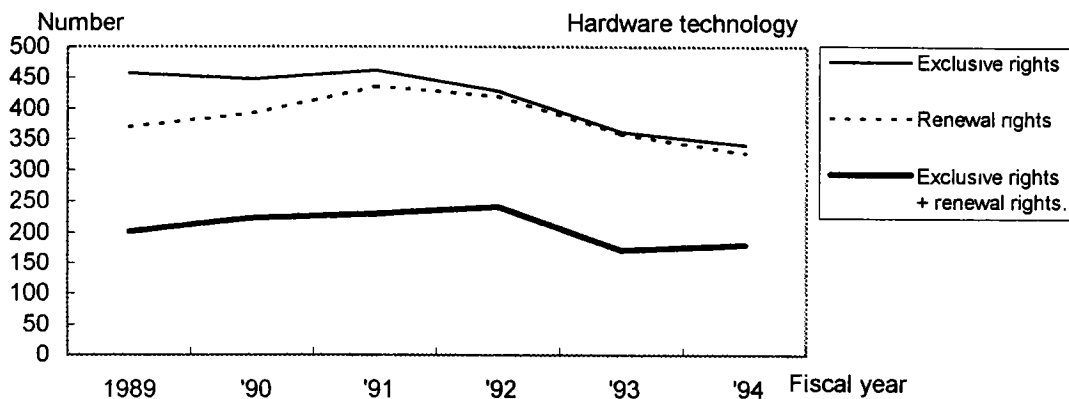


Figure 19 Trends in Right Acquisition



(3) Cross-licensing Contracts

An examination of cross-licensing contracts broken down by technology format indicates that there were 97 such contracts for "hardware technology," eight for "software," and none for "trademark only."

We examined the trend in "hardware technology" cross-licensing contracts broken down by country of origin and Technology Classification. The United States has overwhelmingly been the leader among countries of origin since fiscal 1989, and rises and falls in the number of cross-licensing contracts involving the USA has had a major impact on the rises and falls in the number of cross-licensing contracts overall (Figure 20).

Among Technology Classification, cross-licensing contracts are most numerous for "electronic parts and devices." Variations in the number of cross-licensing contracts for "electronic parts and devices" have affected the rises and falls in the overall trend, but this effect has been decreasing since fiscal 1993 as the overall number has risen (Figure 21).

Figure 20 Trend in Cross-licensing Contracts by Country of Origin (Hardware Technology)

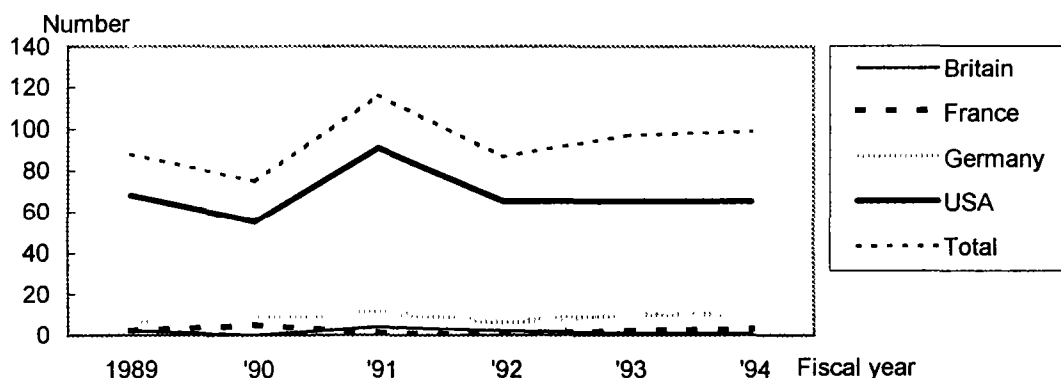
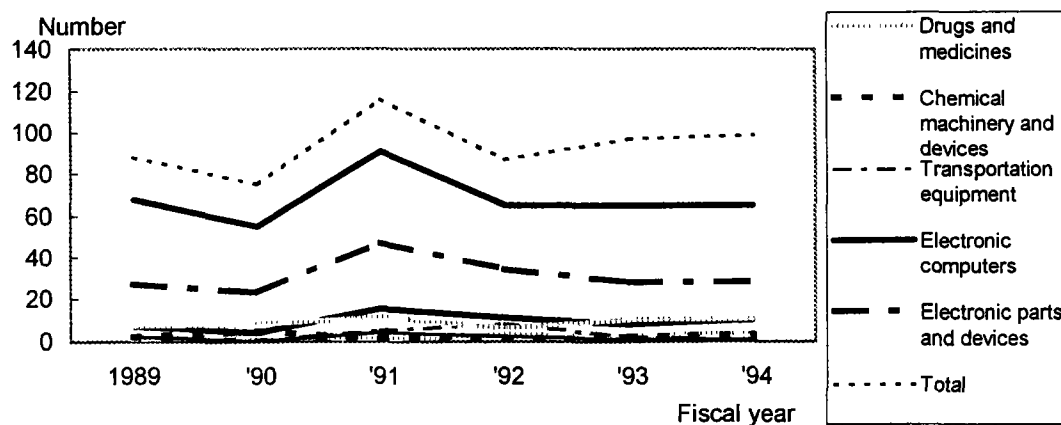


Figure 21 Trend in Cross-licensing Contracts by Major Technology Classification (Hardware Technology)



(4) Contract Term

In the "hardware technology", long-term contracts were comparatively numerous. In the "software", terms of "other" (no specified term, a term of "in perpetuity," etc.) were the most common. When the contract term was specified, it was usually short-term, but in many such cases an automatic renewal clause was present. However, we do not believe that all "software" contracts end up being long term, because there is always the possibility of dissolving the contract when it comes up for renewal. In the "trademark only", short-term contracts were comparatively numerous (Figure 22).

The trend in contract terms since fiscal 1989 has been for fewer long-term contracts in the "hardware technology".

In the "software", there has been an increase in the number of short-term contracts and a decrease in the number of contracts with terms of "other" (no specified term, etc.). However, since some short-term contracts have an automatic renewal clause, we cannot say that the contract terms are actually getting shorter.

In the "trademark only", there was an increase in the number of contracts with terms of "other." (Figure 23).

Figure 22 Contract Term by Technology Format

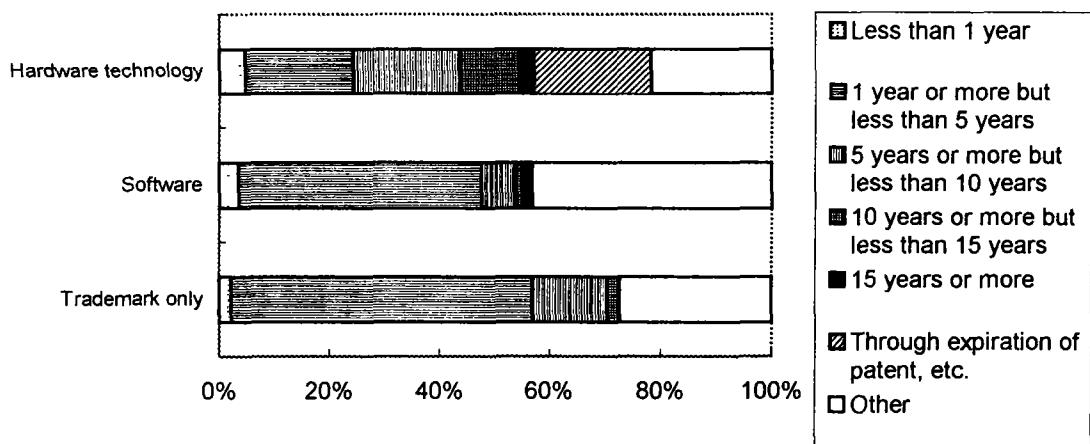
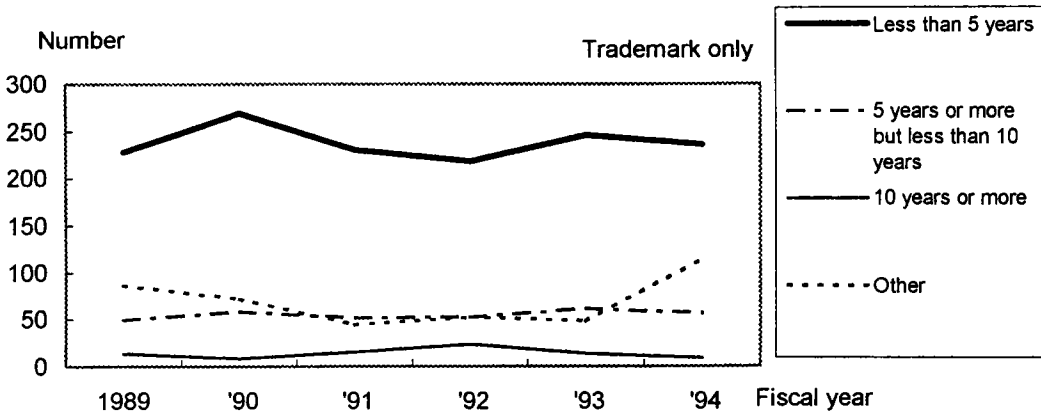
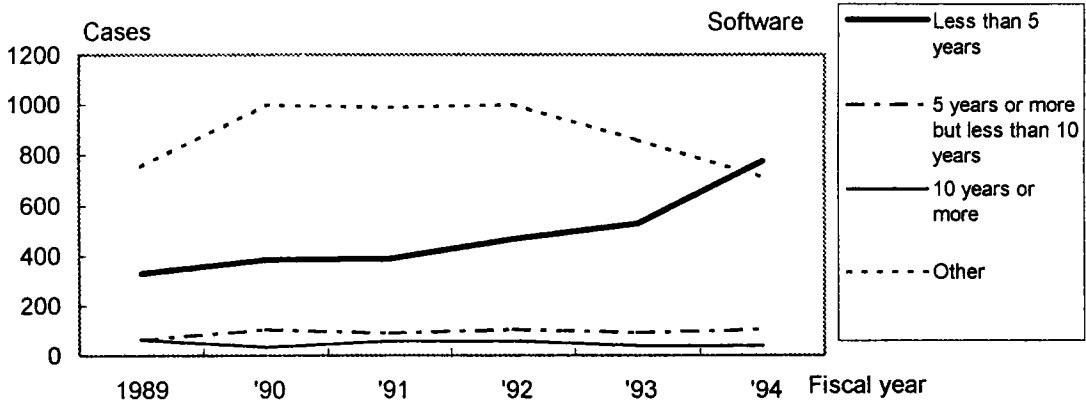
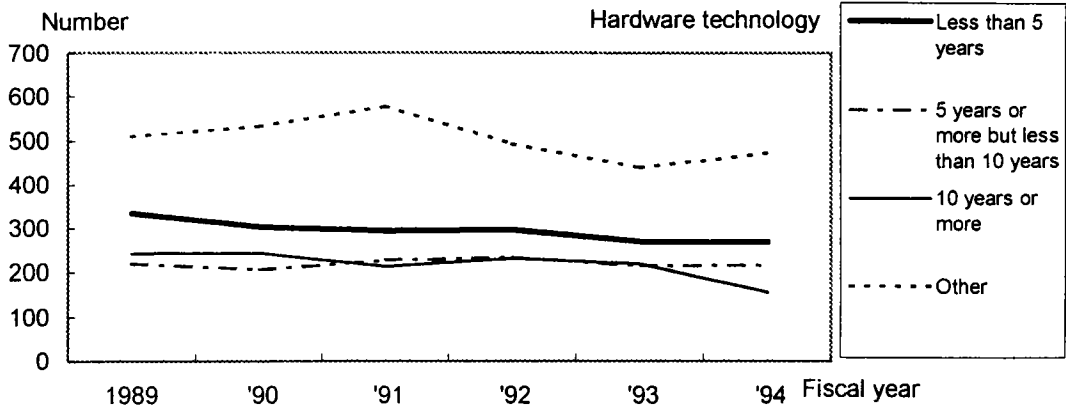


Figure 23 Contract Term Trends



(5) Import Status by Size of Capital

In the "hardware technology" and "software", a large percentage of the enterprises involved were capitalized on a large size, but in the case of "software," there were also a large number of enterprises capitalized at "100 million to 500 million yen." A comparatively high percentage of the enterprises entering into "trademark only" contracts were capitalized on a small size (Figure 24).

The trends in technology imports since fiscal 1989 broken down by size of capital were as follows: in the "hardware technology", there were no substantial changes in the size of capital trend for technology imports. However, the 10 billion yen or more segment did experience a small decline from fiscal 1992 onward.

In the "software", the "10 billion yen or more" segment has continued to grow up through the present. Also, the increase in the number of cases accounted for by enterprises with small-scale capitalization of "less than 100 million yen" was noteworthy. Since fiscal 1993, the "less than 1 billion yen" segment has experienced a decrease.

In the "trademark only", the "1 billion yen or more" and the "less than 1 billion yen" segments have shown opposite tendencies. Broken down by Technology Classification, the "1 billion yen or more" segment has shown an increase since fiscal 1991 in "electronic computers," and the like. During the same period, the "less than 1 billion yen" segment has declined in Classification entries such as "tanned leather, leather goods, furs" (Figure 25).

Figure 24 Ratio of Imports by Size of Capital

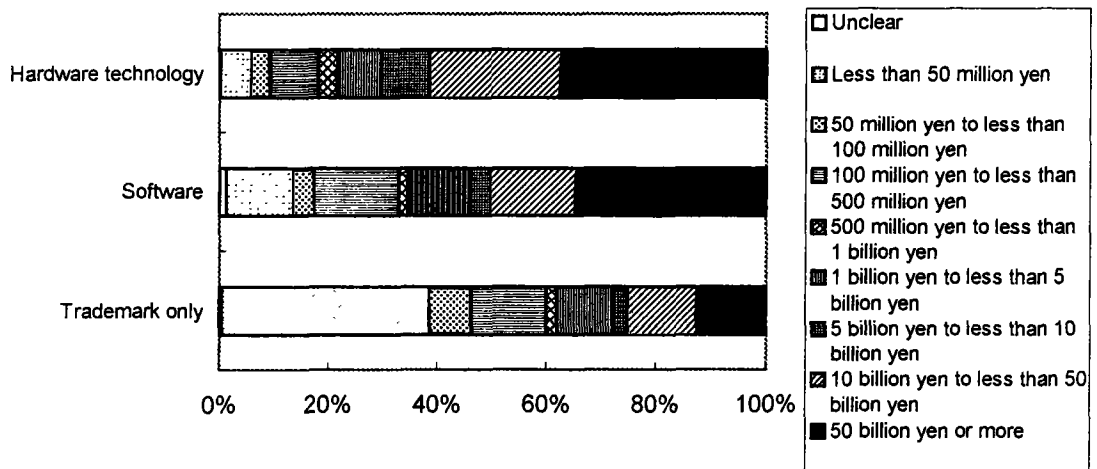
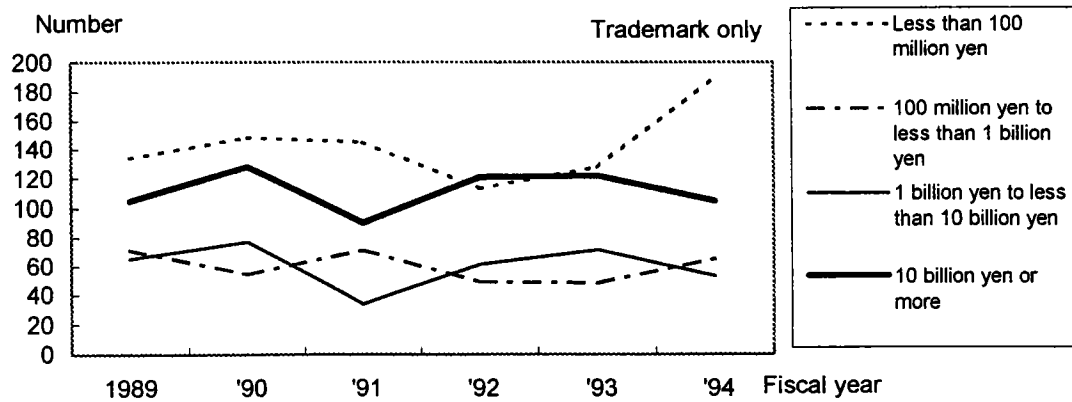
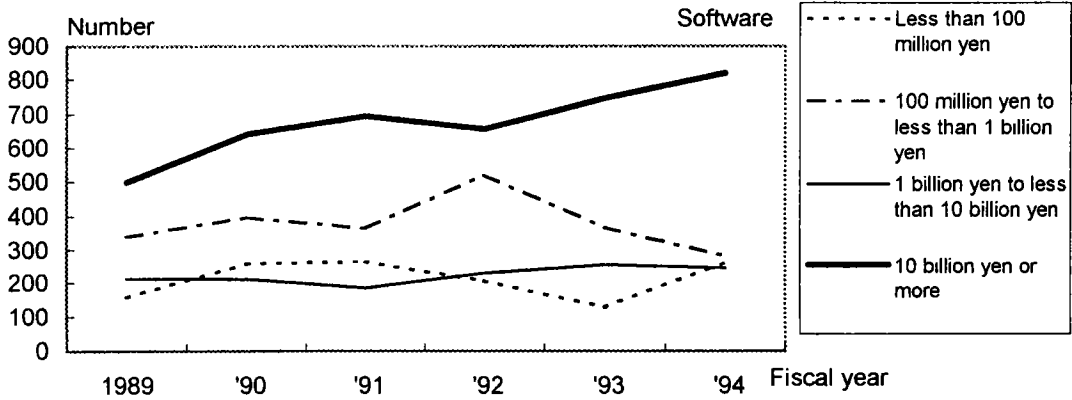
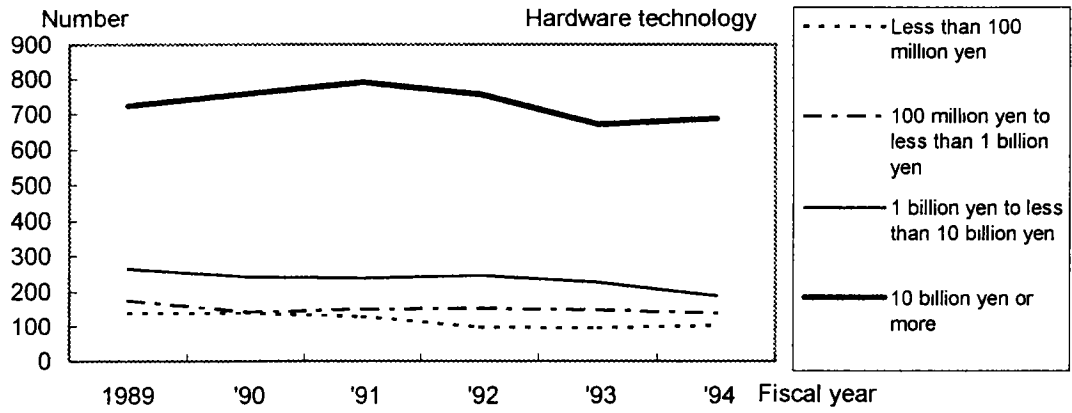


Figure 25 Trend in Number of Import Cases by Size of Capital



2.4 Characteristics of Import Status by Type of Business

(1) Import Status by Type of Business

Here we examine the status of technology imports by type of business and by "technology format."

In the "hardware technology", imports by enterprises in manufacturing industries, such as the "communications and electronics equipment industry," the "general machinery manufacturing industry," and the "electrical machinery, equipment and supplies industry," were the most numerous. There were also a number of cases accounted for by non-manufacturing fields such as the "transport, communications and public utilities industry" and by various wholesaling industries.

In the "software", imports by enterprises in manufacturing industries, such as the "communications and electronics equipment industry," the "general machinery manufacturing industry," and the "electrical machinery, equipment and supplies industry," were numerous, but imports by enterprises in non-manufacturing fields such as the "information services and surveys industry" and the "machinery and tools wholesale industry" are growing and have actually outstripped the total for manufacturing industries.

In the "trademark only" format, imports by enterprises in the "textiles industry" were the most numerous (See Table 3.)

Figure 26 Ratio of Imports by Type of Business Hardware technology

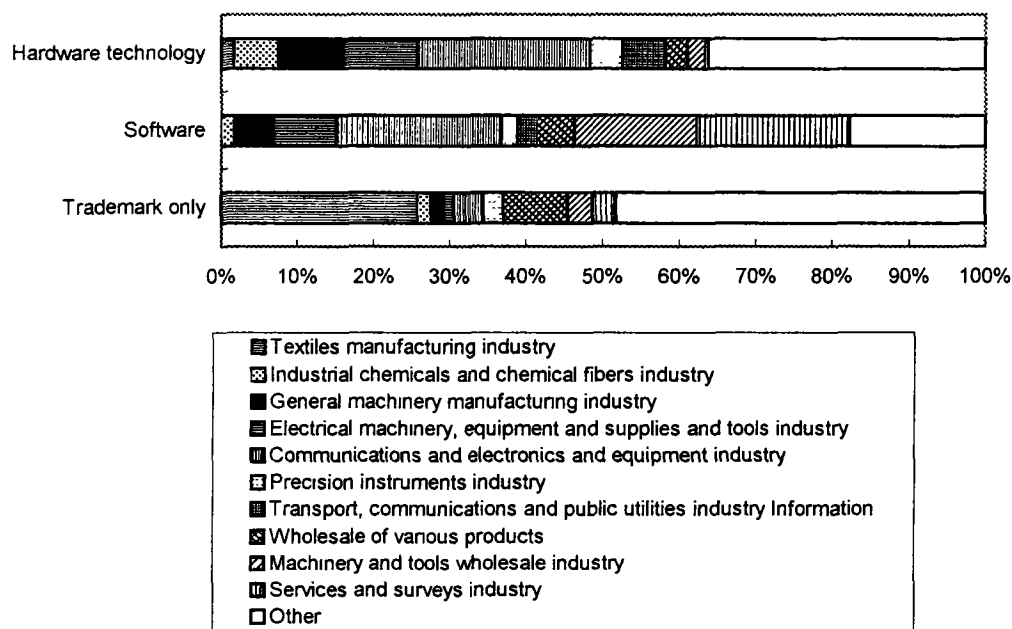


Table 3 Number of Import Cases by Industrial Classification and "Technology Format"

Industrial Classification		Total	Import technology format		
			Hardware technology	Software	Trademark only
010~040	Agriculture, forestry, and fisheries	2	1	1	
050~080	Mining	5	3	2	
090~110	Construction	25	14	11	
120~340	Manufacturing	1884	923	764(37)	197
120~134,136	Food manufacturing	31	24		7
140~150	Textile manufacturing	127	19	1	107
180	Pulps and paper manufacturing	1	1		
190	Printing and publishing	35	6	27	2
200	Chemical products manufacturing	200	148	39(2)	13
201~204	Industrial chemicals and chemical fibers	101	65	29(2)	7
205	Oil and fat, paints industries	14	13	1	
206	Drugs and medicines	66	58	4	4
207,209	Other chemical products	19	12	5	2
210	Petroleum and coal products manufacturing	21	8	13	
220	Plastic products manufacturing	20	19		1
230	Rubber products manufacturing	10	5		5
250	Ceramic	19	18		1
260	Iron and steel manufacturing	39	28	11	
270	Non-ferrous metals and products manufacturing	31	22	9	
280	Fabricated metal products manufacturing	12	11		1
290,330	General machinery manufacturing	182	94	81(5)	7
300	Electrical machinery manufacturing	873	362	489(23)	22
301~303,309	Electrical machinery, equipment and supplies	250	109	135(9)	6
304~308	Communication and electronics, equipment/supplies	623	253	354(14)	16
310	Transportation equipment manufacturing	98	75	21	2
311	Motor vehicles manufacturing	46	38	7	1
312~319	Other transportation equipment industries	52	37	14	1
320	Precision instruments manufacturing	93	48	34(3)	11
135,160,170, 240,340	Other manufacturing	92	35	39(4)	18
35~470, 810	Transport, communication and public utilities	106	63	43(3)	
Subtotal		2022	1004	821(40)	197
480	wholesale trade (general merchandise)	143	30	78(1)	35
490	Wholesale trade (textile and clothing)	69	6		63
500	Wholesale trade (food and beverages)	3	1	1	1
510	Wholesale trade (construction materials, ore, metals, etc.)	18	8	5	5
520	Wholesale trade (machinery and equipment)	295	26	257(3)	12
530	Miscellaneous wholesale trade	19	10	3	6
540	Wholesale trade (general merchandise)	26	5		21
550	Retail trade (textiles, clothing and apparel accessories)	3	3		
560	Retail trade (food and beverage)	2		1	1
570	Retail trade (motor vehicles and bicycles)				
580	Retail trade (furniture, household utensil and household appliance)	3	2	1	
590	Miscellaneous retail trade	1	1		
600	General eating and drinking places	2	1		
610	Other eating and drinking places				1

Industrial Classification		Total	Import technology format		
			Hardware technology	Software	Trademark only
620	Banks and trust banks	37		37	
630	Financial institutions for small business				
640	Financial institutions for agriculture, forestry and fisheries				
650	Government related financial institutions	3		3	
660	Non-deposit money corporations engaged in the provision of finance, credit and investment	2		2	
670	Financial auxiliaries	3	1		2
680	Securities and futures commodity dealing activities	7		7	
690	Insurance institutions	4		4	
700	Real estate agencies				
710	Real estate lessors and managers				
720	Laundry, beauty and bath services				
730	Automobile parking				
740	Miscellaneous domestic and personal services				
750	Hotels, boarding houses and other lodging places				
760	Amusement and recreation services	4			4
770	Automobile repair services				
780	Machine, upholstery, furniture, etc, repair services				
790	Goods rental and leasing	26		26	
800	Motion picture, video production and distribution	15	1	13	1
820	Information services and research	346	5	327(3)	14
830	Advertising agencies	2		2	
840	Professional services, not elsewhere classified	59	3	8(1)	48
850	Cooperative associations, not elsewhere classified	2	2		
860	Miscellaneous business services	6	1	1	4
870	Waste treatment services				
880	Medical and other health services				
890	Public health services	4	4		
900	Social insurance and social welfare				
910	Education	11		11	
920	Scientific research institutes	24	3	21	
930	Religion				
940	Political, business and cultural organizations				
950	Miscellaneous services				
960	Foreign governments and international agencies in Japan				
970	National government services				
980	Local government services				
990	Establishments not adequately described				
Subtotal		1139	113	808(8)	218
Grand total		3161	1117	1629(48)	415

Note 1. The three-digit numbers in the far left column are code of the "Standard Industrial Classification for Japan". Those up to 470 as well as 810 (broadcasting) are covered in the "Report on the Survey of Research and Development" published by the Management and Coordination Agency.

Note 2: Figures in parentheses () represent cases where "hardware technology" and "software" overlap. They are included in the figures immediately to the left of them.

(2) Import Status by Type of Business and Size of Capital

Now we will examine the differences in imports by enterprises with various sizes of capital, broken down by type of business (Figure 27).

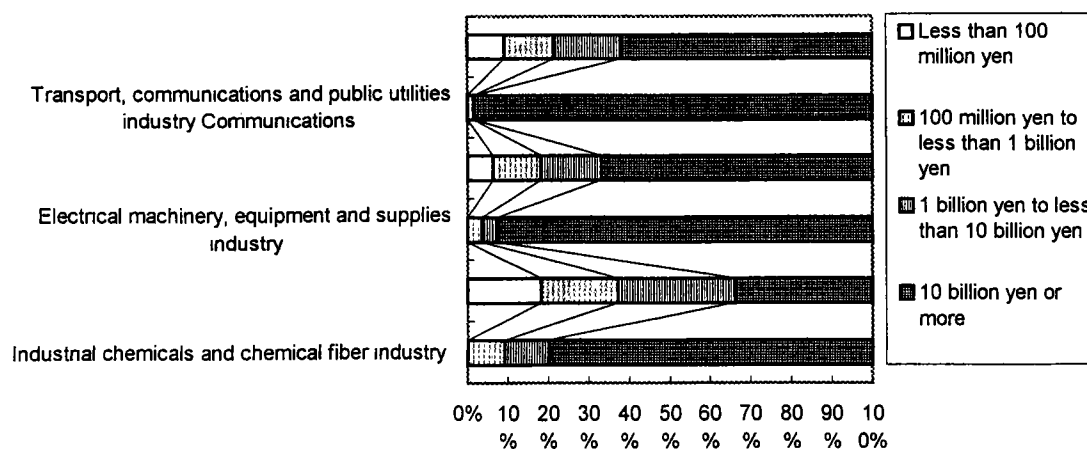
In the "hardware technology", enterprises in the "transport, communications and public utilities industry," the "electrical machinery, equipment and supplies industry," and the "industrial chemicals and Chemical fibers industry" were comparatively large in size of capital. In contrast, enterprises in the "general machinery manufacturing industry" were comparatively small in size of capital.

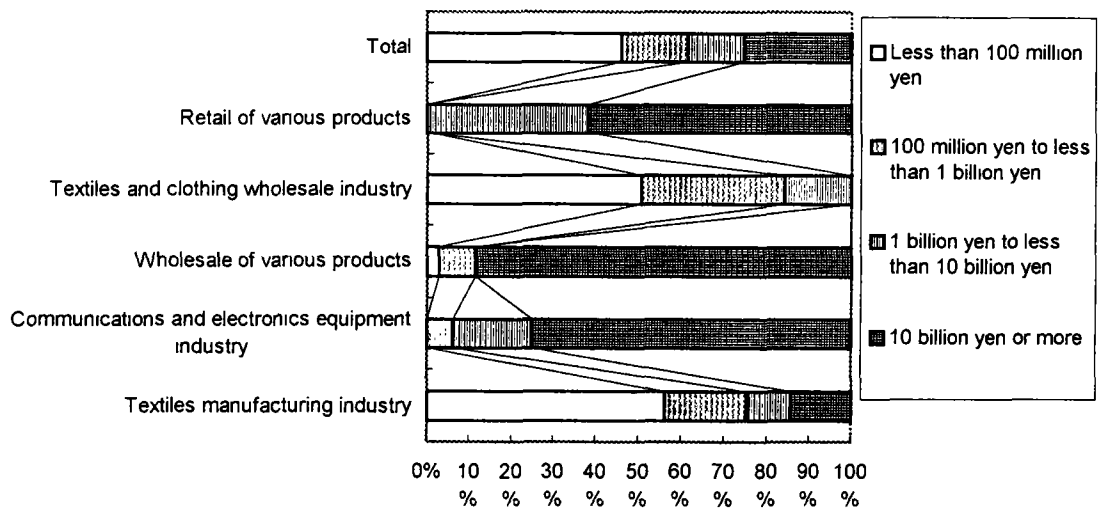
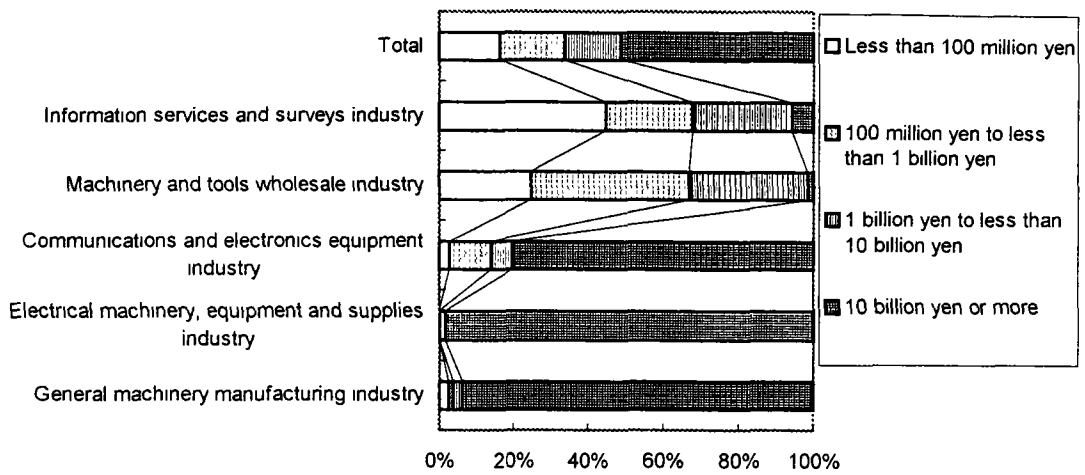
In the "software", most of the manufacturing enterprises in the "electrical machinery, equipment and supplies industry," the "general machinery manufacturing industry," and the "communications and electronics equipment industry" were large in size of capital. In contrast, non-manufacturing enterprises in the "information services and surveys industry" and the "machinery and tools wholesale industry" were medium or small in size of capitalization.

In the "software", imports by enterprises with a large size of capitalization were increasing, while smaller enterprises were on a downward trend. Compared with the breakdown by business type in fiscal 1991, imports by enterprises capitalized at "1 billion yen or less" in the "machinery and tools wholesale industry" have dropped sharply. However, imports in many other fields, such as the "communications and electronics equipment industry," have been growing.

In the "trademark only", enterprises with large-size capital were responsible for most imports in the "communications and electronics equipment industry" and the "wholesale of various products" industry. The number of cases of technology imports by specified enterprises in the "general machinery manufacturing industry" is large, and most of the imports in the "wholesale of various products" field were by trading companies. The size of capital of importing enterprises in the "textiles and clothing wholesale industry" was comparatively small.

Figure 27 Ratio of Imports by Type of business and Size of Capital





2.5 Conclusion

(1) Hardware Technology

Over the long term, the number of "hardware technology" import cases is declining. However, it stayed roughly constant between fiscal 1989 and fiscal 1991 because while "outer garment" and the like declined, entries such as "electronic parts and devices" grew. Nevertheless, from fiscal 1991 the overall trend has been a downward one, with a few localized exceptions.

"Patents" are sometimes imported to avoid lawsuits, but imports of "knowhow" are truly indispensable. The decline in "knowhow" imports is powerful evidence that Japan's need to import manufacturing technology is lessening.

"Hardware technology" import cases from every country are decreasing, but, at the same time, the share of such imports accounted for by the United States is increasing.

There were no major changes in import trends with regard to size of capital.

(2) Software

Through fiscal 1990, the number of "software" import cases increased rapidly. This growth stalled in fiscal 1991, was followed by a drop in fiscal 1993, and then resumed in fiscal 1994. Broken down by size of capital and type of business, imports by enterprises in the "machinery and tools wholesale industry" capitalized at less than 1 billion yen dropped from fiscal 1992 onward, while overall "software" import cases increased, for example among enterprises in the "communications and electronics equipment industry" capitalized at 10 billion yen or more.

Among "software" imports, the share of the technology type "knowhow" is large. However, the number of items that are being patented in order to clarify who holds the rights have been increasing. Among countries of origin for software imports, America is overwhelmingly dominant. Also, many of the imports from countries other than the United States are believed to involve enterprises linked to American companies. The dominance of the United States as a source country for software imports appears to be unshakable.

With regard to the payment conditions for technology imports, cases with "initial payment only" are numerous, and this is believed to be due to the fact that many companies simply use the software they purchase in-house without modification. However, since many cases in the "initial payment only" category actually may involve pre-payment of "running royalties" or include agreements to purchase software as a representative for another party, the actual state of payment conditions for "software" imports is really more complex than it seems. Among contracts involving "running royalties," there are many cases listed as "other (unit-price-based, etc.)" rather than having a set royalty rate. Also, when there is a set royalty rate, it is often high. One of the special characteristics of "software" import contracts is that they often have no expiration date or, if they do have an expiration date, renewal is often automatic. Nevertheless, it is not the case that all software import contracts are long-term.

(3) Trademark Only

In the "trademark only", imports in the main categories such as "outer garment" were extremely striking. "Electronic computers," which grew rapidly between fiscal 1992 and fiscal 1993, took a big dive in fiscal 1994. Consequently, imports from Britain related to "textiles" and "outer garment" suddenly increased. Not only did Britain far surpass France, it nearly equaled the number of import cases from the United States, which had suddenly plunged. Nevertheless, as we mentioned in Section 1.1 of Part 1, this sudden surge on the part of Britain was only a temporary occurrence.

With regard to the payment conditions for "trademark only" imports, most contracts included "running royalties," and the rate was generally a comparatively high "5 percent or more but less than 10 percent." Among right acquisition cases, the share involving acquisition of "exclusive rights" was large. Also, relatively short-term contracts were numerous. These tendencies are not changed from fiscal 1989, and we believe that this is a balanced trend for payment conditions in trademark import cases.



