

3. Statistics

(1) Trends in R&D expenditures, etc. in Japan

1. Japan											
FY	Item	Gross domestic product	R&D expenditures	Government financed R&D expenditures	Defense-related R&D expenditures	A	B	C	D	Number of researchers	Population
		Trillion yen	100 Million yen	100 Million yen	100 Million yen	(%)	(%)	(%)	(%)	Persons	10 thousand persons
1981		261.9143	59,823.56	16,124.28	325.73	2.28	27.0	26.6	0.62	394,619	11,790
82		274.5722	65,287.00	16,661.64	364.87	2.38	25.5	25.1	0.61	407,197	11,873
83		286.2782	71,807.82	17,214.33	394.52	2.51	24.0	23.6	0.60	421,468	11,954
84		306.8093	78,939.31	17,777.80	446.07	2.57	22.5	22.1	0.58	450,083	12,031
85		327.4332	88,902.99	18,672.53	586.77	2.72	21.0	20.5	0.57	462,891	12,105
86		341.9205	91,929.32	19,553.11	661.33	2.69	21.3	20.7	0.57	489,100	12,166
87		359.5089	98,366.40	21,118.40	741.35	2.74	21.5	20.9	0.59	504,008	12,224
88		386.7361	106,275.72	21,177.81	827.00	2.75	19.9	19.3	0.55	530,495	12,275
89		414.7429	118,154.82	22,024.20	930.68	2.85	18.6	18.0	0.53	553,336	12,321
90		449.9971	130,783.15	23,465.62	1,042.68	2.91	17.9	17.3	0.52	579,552	12,361
91		472.2614	137,715.24	25,044.63	1,150.45	2.92	18.2	17.5	0.53	603,548	12,410
92		483.8375	139,094.93	26,967.17	1,269.89	2.87	19.4	18.6	0.56	620,014	12,457
93		480.6615	137,091.39	29,658.49	1,371.75	2.85	21.6	20.8	0.62	644,977	12,494
94		486.9469	135,960.30	29,181.77	1,407.88	2.79	21.5	20.6	0.60	664,855	12,527
95		495.7357	144,082.36	32,924.00	1,544.99	2.91	22.9	22.0	0.66	682,590	12,557
96		506.4795	150,793.15	31,605.51	1,652.79	2.98	21.0	20.1	0.62	698,280	12,586
97		510.4658	157,414.99	32,038.52	1,753.40	3.08	20.4	19.5	0.63	720,560	12,616
98		501.3835	161,399.25	34,984.92	1,441.76	3.22	21.7	21.0	0.70	731,017	12,647
99		496.6058	160,105.88	35,037.49	1,465.29	3.22	21.9	21.2	0.71	757,244	12,667
2000		502.7831	162,893.36	35,407.64	1,360.81	3.24	21.7	21.1	0.70	761,857	12,693
2001		492.3467	165,279.98	34,769.43	1,489.88	3.36	21.0	20.3	0.71	750,739	12,731
2002		488.7244	166,750.53	34,526.81	1,434.78	3.41	20.7	20.0	0.71	756,336	12,748
2003		493.5532	168,041.55	33,942.87	1,608.12	3.40	20.2	19.4	0.69	757,339	12,769
2004		496.1970	169,375.84	33,887.63	1,855.22	3.41	20.0	19.1	0.68	787,264	12,778
2005		—	—	—	—	—	—	—	—	790,932	12,776

- Notes: 1. $A (b/a)$ =R&D expenditures as a percentage of gross domestic product, $B (c/b)$ =the ratio of R&D expenditures financed by government, $C ((c-d)/(b-d))$ =the ratio of R&D expenditures financed by government excluding defense R&D expenditures and $D (c/a)$ =government financed R&D expenditures as a percentage of gross domestic product.
2. R&D expenditures and the number of researchers are the total of natural sciences, social sciences and humanities.
 3. The number of researchers is as of April 1 in each fiscal year, except for FY2002 and later, which are as of March 31.
 4. Defense-related R&D expenditures are appropriations to the Defense Agency in the science and technology budget of the government.
 5. The numbers of population are those of national censuses and estimations as of October 1.
 6. Industries were added as new survey targets in FY1996 and FY2001.
 7. Survey coverage categories were changed in 2001; the definition under which the number of researchers was counted up to 2001 differs from that under which it was counted in 2002.

- Sources: 1. Gross domestic product: the Cabinet Office, Economic and Social Research Institute, "Annual Report on National Accounts", "Quarterly Estimates of GDP (Preliminary Report)"
2. R&D expenditures, government-financed R&D expenditures, and number of researchers: Ministry of Internal Affairs and Communications, Statistics Bureau, "Report on the Survey of Research and Development."
 3. Population: "Population Census" and "Population Estimation (as of October 1 of each year)."

(2) Flow of R&D expenditures in Japan (in FY2004)

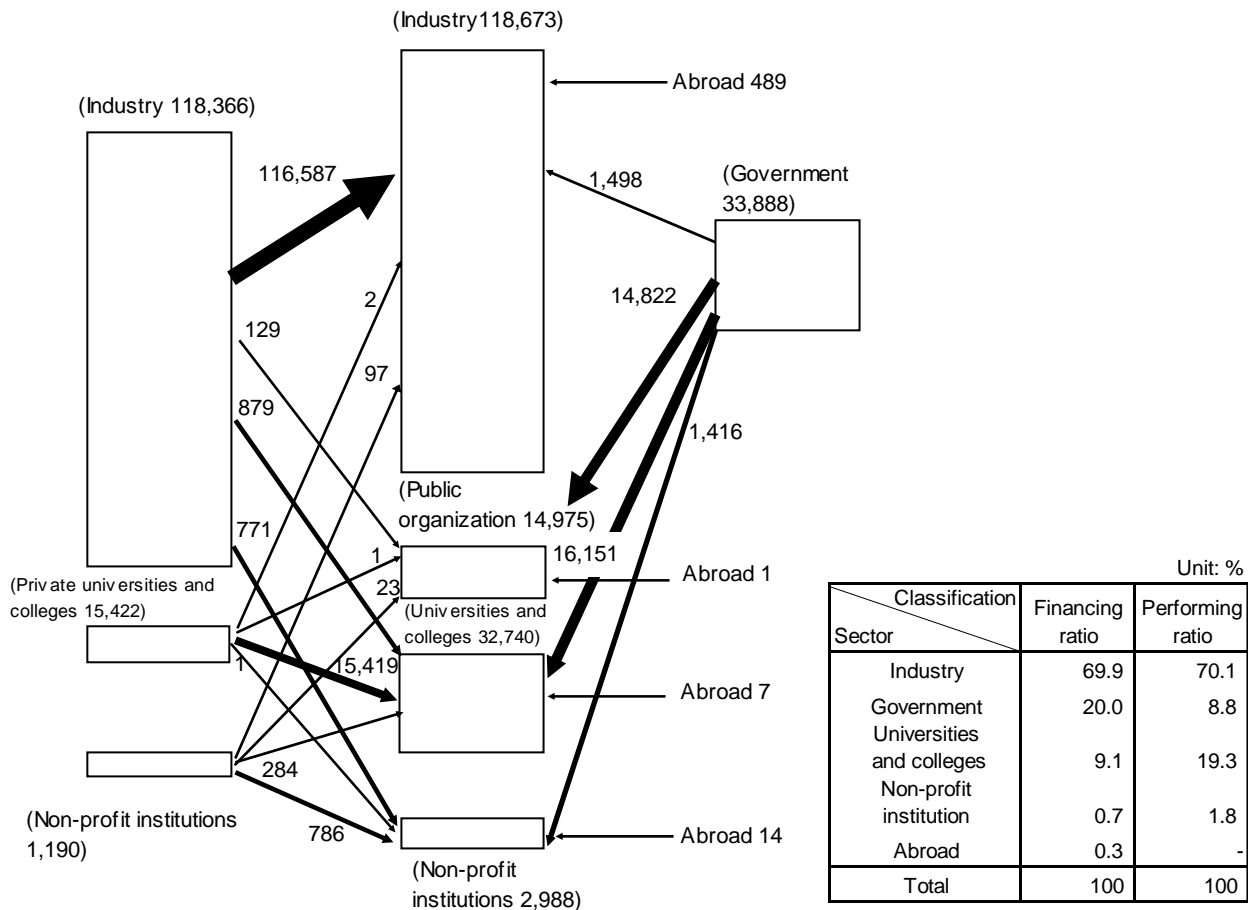
(Unit: 100 million yen)

(Financed by the private sector 134,978)

(Total expenditures amount 169,376)

(Financed from abroad 510)

(Financed by the government 33,888)



Notes: 1. R&D expenditures include social sciences and humanities.

2. R&D expenditures are the funds spent by research institutions themselves for research. There are two concepts of R&D expenditures on a performing basis: disbursement and cost. Japan considers R&D expenditures to be disbursements. Disbursement includes expenditures on labor, materials, tangible fixed assets, lease fee and so on. In case of cost, it computed by adding the depreciation of tangible fixed assets instead of expenditures on the tangible fixed assets.

3. Coverage of each sector is as follows:

(1) Financing sector

- 1) Industry: companies, public corporations and incorporated administrative agencies whose major purpose is not in research activities.
- 2) Government: national and local governments, national local government-owned research institutions, research-centered public corporations and incorporated administrative agencies, and national and public universities and colleges (including junior colleges)
- 3) Universities and colleges: private universities and colleges (including junior colleges)
- 4) Non-profit institutions: nonprofit private research institutions including incorporated foundations and associations, etc.

(2) Performing sector

- 1) Industry: coverage is the same as in the financing sector
- 2) Public organizations: national and local government-owned research institutions and research-centered public corporations and incorporated administrative agencies.
- 3) Universities and colleges: national, public and private universities and colleges.
- 4) Non-profit institutions: coverage is the same as in the financing sector

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(3) Trends in composition ratios of R&D expenditures by character of work in Japan

(Unit: %)

Classification FY	Industry			Government research institutions			Universities and colleges			Private research institutions			Total		
	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development
1981	5.2	21.8	73.0	14.5	32.1	53.4	57.4	35.0	7.6	9.8	36.1	54.2	14.6	25.6	59.8
82	5.5	21.9	72.6	14.4	31.8	53.9	56.5	36.4	7.1	8.3	32.6	59.1	14.7	25.8	59.5
83	5.7	22.0	72.3	14.0	30.7	55.3	56.4	35.7	7.9	9.1	31.2	59.8	14.6	25.3	60.1
84	5.6	22.0	72.4	14.0	29.8	56.2	56.4	35.4	8.2	10.7	31.6	57.7	14.1	25.1	60.8
85	5.9	21.9	72.1	13.1	28.5	58.3	55.7	36.2	8.0	10.4	33.5	56.0	13.4	24.9	61.7
86	6.1	21.6	72.3	13.7	27.3	59.0	55.8	36.2	8.1	14.1	27.8	58.1	13.8	24.4	61.9
87	6.6	21.7	71.7	14.7	28.3	57.0	55.7	36.3	8.0	18.0	21.1	60.9	14.5	24.3	61.2
88	6.6	21.7	71.7	13.6	26.8	59.6	54.5	37.2	8.3	17.6	22.5	59.9	13.8	24.2	62.0
89	6.4	21.5	72.2	13.3	27.3	59.5	54.9	36.8	8.3	19.2	22.8	58.0	13.3	23.9	62.8
90	6.4	21.8	71.8	14.3	28.6	57.1	54.6	37.1	8.3	18.2	22.9	58.8	13.0	24.2	62.8
91	6.8	22.2	71.1	14.6	29.3	56.1	54.5	37.1	8.4	18.7	26.2	55.1	13.3	24.6	62.1
92	6.9	22.1	71.1	16.6	27.6	55.8	54.3	37.3	8.3	17.0	20.4	62.6	13.9	24.4	61.7
93	6.7	21.4	71.9	18.7	26.9	54.5	54.0	37.4	8.6	20.1	20.5	59.4	14.8	24.0	61.2
94	6.8	22.2	71.1	18.5	27.8	53.6	54.2	37.1	8.7	21.1	18.7	60.2	15.0	24.6	60.5
95	6.6	22.0	71.3	20.6	27.7	51.7	54.6	36.5	8.9	20.1	18.9	61.1	15.5	24.5	60.0
96	6.2	22.1	71.8	19.8	26.9	53.3	54.7	36.4	9.0	18.5	19.2	62.4	14.6	24.3	61.1
97	6.2	21.6	72.2	21.3	31.8	46.8	54.3	36.7	9.0	14.9	21.1	64.0	14.3	24.4	61.3
98	5.6	21.9	72.6	24.5	29.9	45.6	54.8	36.3	8.9	14.4	21.9	63.8	14.4	24.6	61.0
99	5.8	20.5	73.7	25.0	27.9	47.1	54.0	36.9	9.1	15.3	21.9	62.8	14.6	23.5	61.8
2000	5.8	21.3	73.0	27.6	26.8	45.7	53.6	37.3	9.1	15.7	20.5	63.8	14.7	23.9	61.4
01	5.8	20.4	73.9	30.5	24.1	45.3	53.5	37.5	9.0	19.6	37.1	43.2	14.6	23.4	62.0
02	5.9	19.5	74.6	31.0	26.9	42.1	54.0	36.4	9.6	20.1	38.9	41.1	15.0	22.8	62.2
03	6.0	19.4	74.7	30.9	30.5	38.6	55.0	36.5	8.5	18.7	39.3	42.0	15.0	23.0	62.0

Note: 1. The figures are for the composition of R&D expenditures by character of work in the natural sciences (physical science, engineering, agricultural science, and health science). Figures include institutions for the social sciences and humanities.

2. Survey coverage categories were changed in FY2001; figures for non-profit institutions up to FY2001 use the values for private research institutions.

3. Some Industries were added as new survey targets in FY1966 and FY2001

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(4) Trends in R&D expenditures by financing sector in Japan

(Unit: million yen)

Classification FY	Total		National and local government		Private sector		Abroad	
	R&D expenditures (A)	Ratio (%)	Financing amount (B)	Ratio (%) (B/A)	Financing amount (C)	Ratio (%) (C/A)	Financing amount (D)	Ratio (%) (D/A)
1981	5,982,356	100	1,612,428	27.0	4,363,785	72.9	6,144	0.1
82	6,528,700	100	1,666,164	25.5	4,855,537	74.4	6,999	0.1
83	7,180,782	100	1,721,433	24.0	5,451,130	75.9	8,220	0.1
84	7,893,931	100	1,777,780	22.5	6,108,562	77.4	7,590	0.1
85	8,890,299	100	1,867,253	21.0	7,014,906	78.9	8,140	0.1
86	9,192,932	100	1,955,311	21.3	7,229,721	78.6	7,900	0.1
87	9,836,640	100	2,111,840	21.5	7,716,556	78.4	8,243	0.1
88	10,627,572	100	2,117,781	19.9	8,501,469	80.0	8,323	0.1
89	11,815,482	100	2,202,420	18.6	9,603,321	81.3	9,742	0.1
90	13,078,315	100	2,346,562	17.9	10,721,479	82.0	10,274	0.1
91	13,771,523	100	2,504,463	18.2	11,255,016	81.7	12,044	0.1
92	13,909,493	100	2,696,717	19.4	11,199,371	80.5	13,405	0.1
93	13,709,139	100	2,965,849	21.6	10,731,483	78.3	11,807	0.1
94	13,596,029	100	2,918,177	21.5	10,663,868	78.4	13,984	0.1
95	14,408,235	100	3,292,400	22.9	11,100,469	77.0	15,366	0.1
96	15,079,315	100	3,160,551	21.0	11,904,662	78.9	14,102	0.1
97	15,741,499	100	3,203,852	20.4	12,493,864	79.4	43,783	0.3
98	16,139,925	100	3,498,492	21.7	12,593,344	78.0	48,089	0.3
99	16,010,588	100	3,503,749	21.9	12,448,321	77.8	58,519	0.4
2000	16,289,336	100	3,540,764	21.7	12,684,198	77.9	64,374	0.4
01	16,527,998	100	3,476,943	21.0	12,986,146	78.6	64,909	0.4
02	16,675,053	100	3,452,681	20.7	13,162,679	78.9	59,694	0.4
03	16,804,155	100	3,394,287	20.2	13,363,302	79.5	46,566	0.3
04	16,937,584	100	3,388,763	20.0	13,497,794	79.7	51,028	0.3

Notes: 1. Including R&D in the social sciences and humanities.

2. Some Industries were added as new survey targets in FY1996 and FY2001.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research

(5) Trends in R&D expenditures by performing sector in Japan

(Unit: million yen)

Classification FY	Business enterprises				Non-profit institutions		Public organizations				
	Companies	Public corporations/ Incorporated administrative (a)	Total (A)	Ratio (%) (A/E)	(B)	Ratio (%) (B/E)	National	Local government owned	Public corporations/ Incorporated (b)	Total (C)	Ratio (%) (C/E)
1981	3,517,034	112,759	3,629,793	60.7	245,521	4.1	201,256	191,162	268,979	661,397	11.1
82	3,917,089	121,929	4,039,018	61.9	276,178	4.2	203,343	189,702	280,038	673,083	10.3
83	4,435,361	124,766	4,560,127	63.5	279,651	3.9	208,767	191,567	291,025	691,359	9.6
84	5,114,631	22,003	5,136,634	65.1	307,425	3.9	215,853	199,622	310,209	725,684	9.2
85	5,913,942	26,005	5,939,947	66.8	349,812	3.9	235,950	206,935	367,874	810,759	9.1
86	6,105,886	14,277	6,120,163	66.6	399,971	4.4	244,828	209,212	386,183	840,223	9.1
87	6,480,897	13,370	6,494,268	66.0	441,273	4.5	308,246	215,583	419,348	943,177	9.6
88	7,202,873	16,446	7,219,318	67.9	458,925	4.3	272,506	223,677	439,072	935,255	8.8
89	8,217,138	16,682	8,233,820	69.7	498,535	4.2	284,261	240,902	428,592	953,755	8.1
90	9,246,003	21,163	9,267,166	70.9	537,291	4.1	318,959	270,303	387,605	976,867	7.5
91	9,716,195	26,853	9,743,048	70.7	573,453	4.2	321,988	282,730	442,378	1,047,096	7.6
92	9,541,757	18,928	9,560,685	68.7	612,427	4.4	373,004	288,631	498,466	1,160,101	8.3
93	9,028,186	25,422	9,053,608	66.0	618,179	4.5	422,193	300,054	556,394	1,278,641	9.3
94	8,947,451	32,802	8,980,253	66.1	636,800	4.7	404,172	300,515	521,740	1,226,427	9.0
95	9,332,438	63,459	9,395,896	65.2	640,021	4.4	484,917	291,893	613,322	1,390,132	9.6
96	10,026,582	31,827	10,058,409	66.7	679,251	4.5	447,366	288,807	592,361	1,328,534	8.8
97	10,620,651	37,705	10,658,357	67.7	716,967	4.6	474,120	279,099	553,757	1,306,976	8.3
98	10,668,070	131,993	10,800,063	66.9	714,068	4.4	474,238	291,222	637,454	1,402,914	8.7
99	10,520,427	109,735	10,630,161	66.4	689,609	4.3	488,781	286,482	706,468	1,481,731	9.3
2000	10,766,366	93,848	10,860,215	66.7	707,069	4.3	499,508	273,139	740,986	1,513,633	9.3
01	11,364,628	86,383	11,451,011	69.3	361,570	2.2	214,302	260,076	1,007,645	1,482,024	9.0
02	11,496,855	79,985	11,576,840	69.4	332,664	2.0	202,161	249,788	1,031,261	1,483,211	8.9
03	11,704,668	54,271	11,758,939	70.0	321,968	1.9	225,382	239,553	995,205	1,460,140	8.7
04	11,847,859	19,417	11,867,276	70.1	298,796	1.8	246,374	230,978	1,020,195	1,497,546	8.8

(5) Trends in R&D expenditures by performing sector in Japan (continued)

Classification FY	Universities and colleges					Total	
	National	Public	Private	Total (D)	Ratio (%) (D/E)	(E)	Ratio (%)
1981	643,472	72,582	729,591	1,445,645	24.2	5,982,356	100
82	675,850	75,986	788,586	1,540,422	23.6	6,528,700	100
83	711,364	78,097	860,184	1,649,646	23.0	7,180,782	100
84	749,826	81,964	892,398	1,724,187	21.8	7,893,931	100
85	756,686	88,645	944,449	1,789,780	20.1	8,890,299	100
86	786,462	90,608	955,505	1,832,575	19.9	9,192,932	100
87	843,900	96,756	1,017,264	1,957,921	19.9	9,836,640	100
88	860,678	97,888	1,055,508	2,014,073	19.0	10,627,572	100
89	899,221	114,331	1,115,819	2,129,372	18.0	11,815,482	100
90	961,724	126,936	1,208,331	2,296,992	17.6	13,078,315	100
91	1,001,800	124,153	1,281,974	2,407,927	17.5	13,771,524	100
92	1,077,675	138,430	1,360,176	2,576,281	18.5	13,909,493	100
93	1,191,676	144,959	1,422,077	2,758,712	20.1	13,709,139	100
94	1,163,036	160,477	1,429,038	2,752,551	20.2	13,596,030	100
95	1,311,399	177,474	1,493,313	2,982,187	20.7	14,408,236	100
96	1,296,359	173,288	1,543,474	3,013,120	20.0	15,079,315	100
97	1,300,615	182,796	1,575,788	3,059,199	19.4	15,741,499	100
98	1,406,556	184,576	1,631,747	3,222,879	20.0	16,139,925	100
99	1,395,167	184,088	1,629,831	3,209,086	20.0	16,010,588	100
2000	1,385,637	188,106	1,634,675	3,208,418	19.7	16,289,336	100
01	1,390,794	186,617	1,655,980	3,233,392	19.6	16,527,998	100
02	1,435,972	183,965	1,662,401	3,282,338	19.7	16,675,053	100
03	1,410,545	181,350	1,671,214	3,263,109	19.4	16,804,155	100
04	1,367,747	188,409	1,717,810	3,273,966	19.3	16,937,584	100

Notes: 1. Figures include the social sciences and humanities.

2. Survey coverage categories were changed in FY2001; figures for non-profit institutions up to FY2000 use the values for private research institutions.

3. Until FY2000, public corporations and independent administrative institutions (a) were those which were operated on a self-paying basis. Since FY2001, they indicate those whose main productive activities are classified into "Industries" in the input-output table.

4. Until FY2000, public corporations and independent administrative institutions (b) were those which were not expected to operate on a self-paying basis. Since FY2001, they indicate those whose purpose is to carry out examinations and research on scientific technologies.

5. Some Industries were added as new survey targets in FY1996 and FY2001.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(6) Trends in composition ratios of R&D expenditures by constituent elements in Japan

(Unit: million yen)

Expense item		Total amount of R&D expenditures	Labor cost		Material cost		Expenditure on tangible fixed assets		Lease fee		Other expenses	
			Ratio (%)	Ratio (%)	Ratio (%)	Ratio (%)	Ratio (%)	Ratio (%)				
1987	Total	9,836,640	4,408,202	44.8	1,649,009	16.8	1,699,734	17.3	...	...	2,079,695	21.1
88	Total	10,627,572	4,751,744	44.7	1,865,427	17.6	1,684,476	15.9	...	...	2,325,925	21.9
89	Total	11,815,482	5,157,612	43.7	2,122,497	18.0	1,898,230	16.1	...	...	2,637,144	22.3
90	Total	13,078,315	5,666,706	43.3	2,399,308	18.3	2,054,560	15.7	...	...	2,957,740	22.6
91	Total	13,771,524	5,956,397	43.3	2,403,971	17.5	2,149,488	15.6	...	...	3,261,668	23.7
92	Total	13,909,493	6,236,450	44.8	2,322,072	16.7	1,952,988	14.0	...	...	3,397,984	24.4
93	Total	13,709,139	6,357,527	46.4	2,147,058	15.7	1,910,782	13.9	...	...	3,293,772	24.0
94	Total	13,596,030	6,498,958	47.8	2,162,027	15.9	1,706,059	12.5	...	...	3,228,986	23.7
95	Total	14,408,236	6,719,897	44.0	2,304,175	17.3	1,970,607	14.2	...	...	3,413,557	24.5
96	Total	15,079,315	6,987,518	46.3	2,560,417	17.0	1,868,326	12.4	...	...	3,663,055	24.3
97	Total	15,741,499	7,209,396	45.8	2,694,767	17.1	1,897,202	12.1	...	...	3,940,134	25.0
98	Total	16,139,925	7,415,988	45.9	2,649,973	16.4	1,938,341	12.0	...	...	4,135,623	25.6
99	Total	16,010,588	7,371,720	46.0	2,680,753	16.7	1,864,370	11.6	...	...	4,093,745	25.6
	Business enterprises	10,630,161	4,627,391	43.5	2,088,392	19.6	987,000	9.3	...	...	2,927,379	27.5
	Government research institutions	1,481,731	439,590	29.7	199,779	13.5	408,900	27.6	...	...	433,462	29.3
	Universities and colleges	3,209,086	2,086,089	65.0	219,074	6.8	409,563	12.8	...	...	494,360	15.4
	Privateresearch institutions	689,609	218,649	31.7	173,508	25.2	58,907	8.5	...	...	238,545	34.6
2000	Total	16,289,336	7,312,424	44.9	2,758,692	16.9	1,885,601	11.6	...	...	4,332,619	26.6
	Business enterprises	10,860,216	4,532,255	41.7	2,153,595	19.8	1,051,243	9.7	...	...	3,123,123	28.8
	Government research institutions	1,513,633	447,804	29.6	200,780	13.3	398,020	26.3	...	...	467,029	30.9
	Universities and colleges	3,208,418	2,105,484	65.6	216,542	6.7	375,125	11.7	...	...	511,267	15.9
	Private research institutions	707,069	226,880	32.1	187,776	26.6	61,213	8.7	...	...	231,200	32.7
01	Total	16,527,998	7,407,835	44.8	2,861,584	17.3	1,806,677	10.9	166,882	1.0	4,285,019	25.9
	Business enterprises	11,451,011	4,731,473	41.3	2,379,628	20.8	1,035,594	9.0	105,165	0.9	3,199,151	27.9
	Public organizations	1,482,024	462,892	31.2	207,974	14.0	353,399	23.8	16,497	1.1	441,261	29.8
	Universities and colleges	3,233,392	2,109,802	65.3	217,515	6.7	371,196	11.5	40,449	1.3	494,430	15.3
	Non-profit institutions	361,570	103,667	28.7	56,468	15.6	46,488	12.9	4,771	1.3	150,176	41.5
02	Total	16,675,053	7,399,615	44.4	2,750,181	16.5	1,752,587	10.5	177,221	1.1	4,595,450	27.6
	Business enterprises	11,576,840	4,745,939	41.0	2,270,648	19.6	970,294	8.4	113,827	1.0	3,476,132	30.0
	Public organizations	1,483,211	452,855	30.5	204,258	13.8	355,305	24.0	17,248	1.2	453,515	30.6
	Universities and colleges	3,282,338	2,100,077	64.0	229,670	7.0	381,533	11.6	42,318	1.3	528,740	16.1
	Non-profit institutions	332,664	100,713	30.3	45,604	13.7	45,454	13.7	3,828	1.2	106,676	32.1
03	Total	16,804,155	7,631,443	45.4	2,785,558	16.6	1,737,555	10.3	180,797	1.1	4,468,803	26.6
	Business enterprises	11,758,939	4,990,754	42.4	2,249,712	19.1	1,005,455	8.6	118,282	1.0	3,394,736	28.9
	Public organizations	1,460,139	447,368	30.6	263,474	18.0	321,307	22.0	18,086	1.2	409,903	28.1
	Universities and colleges	3,263,109	2,094,863	64.2	231,849	7.1	361,709	11.1	41,354	1.3	533,334	16.3
	Non-profit institutions	321,968	98,458	30.6	40,523	12.6	49,084	15.2	3,074	1.0	130,829	40.6
04	Total	16,937,584	7,611,525	44.9	2,816,867	16.6	1,562,737	9.2	178,354	1.1	4,768,100	28.2
	Business enterprises	11,867,276	4,897,412	41.3	2,313,775	19.5	957,187	8.1	111,639	0.9	3,587,263	30.2
	Public organizations	1,497,546	463,874	31.0	261,638	17.5	244,865	16.4	18,368	1.2	508,802	34.0
	Universities and colleges	3,273,966	2,158,580	65.9	208,327	6.4	316,491	9.7	43,773	1.3	546,794	16.7
	Non-profit institutions	298,796	91,659	30.7	33,127	11.1	44,194	14.8	4,575	1.5	125,241	41.9

Notes: 1. Figures includes the social sciences and humanities.

2. Survey coverage categories were changed in FY2001; figures for non-profit institutions up to FY2000 use the values for private research institutions.

3. Lease fee was added as an expenditure in FY2001.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(7) Trends in number of personnel engaged in R&D activities in Japan

(Unit: person)

Year	Classification Number of R&D	Personnel engaged in R&D activities			Researchers		Assistant research workers		Technicians		Clerical and other supporting personnel	
1981	19,447	644,386	100	394,619	61.2	83,657	13.0	90,426	14.0	75,684	11.7	
82	18,642	663,549	100	407,197	61.4	87,329	13.2	91,169	13.7	77,854	11.7	
83	20,838	684,365	100	421,468	61.6	90,103	13.2	93,326	13.6	79,468	11.6	
84	18,137	725,615	100	450,083	62.0	96,272	13.3	97,074	13.4	82,186	11.3	
85	17,755	745,604	100	462,891	62.1	100,530	13.5	99,280	13.3	82,903	11.1	
86	16,987	777,454	100	489,100	62.9	101,996	13.1	101,861	13.1	84,497	10.9	
87	17,681	794,730	100	504,008	63.4	102,901	12.9	102,486	12.9	85,335	10.7	
88	18,303	821,061	100	530,495	64.6	101,587	12.4	102,950	12.5	86,029	10.5	
89	18,316	849,183	100	553,336	65.2	101,809	12.0	105,430	12.4	88,608	10.4	
90	17,497	882,658	100	579,552	65.7	106,117	12.0	104,190	11.8	92,799	10.5	
91	17,823	920,019	100	603,548	65.6	106,179	11.5	113,562	12.3	96,730	10.5	
92	18,144	931,732	100	620,014	66.5	107,013	11.5	108,014	11.6	96,691	10.4	
93	16,057	962,050	100	644,977	67.0	107,001	11.1	108,120	11.2	101,952	10.6	
94	16,997	971,227	100	664,855	68.5	99,152	10.2	103,400	10.6	103,820	10.7	
95	18,835	969,547	100	682,590	70.4	90,072	9.3	98,142	10.1	98,743	10.2	
96	19,028	972,447	100	697,780	71.8	82,851	8.5	94,788	9.7	97,028	10.0	
97	21,878	994,978	100	720,560	72.4	83,906	8.4	93,892	9.4	96,620	9.7	
98	24,931	999,578	100	731,017	73.1	83,539	8.4	89,104	8.9	95,918	9.6	
99	23,607	1,029,968	100	757,244	73.5	86,822	8.4	91,852	8.9	94,050	9.1	
2000	27,061	1,022,079	100	761,857	74.5	84,527	8.3	84,441	8.3	91,254	8.9	
01	22,056	1,000,014	100	750,739	75.1	78,951	7.9	81,157	8.1	89,167	8.9	
02	18,468	972,495	100	756,336	77.8	68,754	7.1	67,138	6.9	80,267	8.3	
03	29,663	968,092	100	757,339	78.2	67,040	6.9	65,143	6.7	78,570	8.1	
04	28,608	994,348	100	787,264	79.2	67,389	6.8	62,450	6.3	77,245	7.8	
05	—	1,009,937	100	790,932	78.3	73,106	7.2	67,582	6.7	78,317	7.8	

- Notes: 1. The number of researchers includes those in the social sciences and humanities, and is as of April 1 of each year, except for FY2002 and later, which are as of March 31.
2. The number of R&D performing institutions is the figure for each year in question.
3. Survey categories were changed in 2002; numbers up to 2001 are for researchers whose primary duty is research (except at universities and colleges, where the number includes those who conduct research as an additional post).
4. Industries were added as new survey targets in 1997 and 2002.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(8) Trends in number of researchers by sector in Japan

(Unit: person)

Classification Year	Business enterprises				Non-profit institutions		Public organizations				
	Companies	Public corporations/ Incorporated administrative agencies (a)	Total (A)	Ratio (%) (A/E)	(B)	Ratio (%) (B/E)	National	Local government owned	corporations/ Incorporated administrative agencies (b)	Total (C)	Ratio (%) (C/E)
1981	181,892	2,997	184,889	47.4	4,861.0	1.2	10,706	15,497	2,589	28,792	7.4
82	189,952	2,990	192,942	48.3	7,408.0	1.8	10,704	15,655	2,652	29,011	7.3
83	198,132	3,005	201,137	48.4	5,971.0	1.4	10,795	15,269	2,767	28,831	6.9
84	220,835	3,047	223,882	50.5	6,856.0	1.5	10,777	15,287	2,697	28,761	6.5
85	230,445	652	231,097	50.7	7,198.0	1.6	10,641	15,464	2,713	28,818	6.3
86	251,138	633	251,771	52.3	7,565.0	1.5	10,770	15,340	2,780	28,890	6.0
87	260,457	389	260,846	52.6	8,427.0	1.7	10,697	15,294	2,918	28,909	5.8
88	278,904	394	279,298	53.6	9,632.0	1.8	10,766	15,004	3,139	28,909	5.6
89	293,789	413	294,202	54.2	10,788.0	1.9	10,899	15,215	3,174	29,288	5.4
90	313,527	421	313,948	55.3	11,497.0	2.0	10,864	15,094	3,364	29,322	5.2
91	330,573	423	330,996	56.0	12,405.0	2.1	10,895	15,107	3,514	29,516	5.0
92	340,387	422	340,809	56.2	13,459.0	2.2	10,943	15,037	3,623	29,603	4.9
93	355,957	449	356,406	56.5	14,104.0	2.2	11,096	15,048	3,750	29,894	4.7
94	366,845	433	367,278	56.5	14,734.0	2.2	11,210	14,862	3,835	29,907	4.6
95	376,179	460	376,639	56.5	16,262.0	2.4	11,223	14,957	4,083	30,263	4.5
96	383,565	535	384,100	56.3	16,113.0	2.3	11,243	14,936	4,167	30,346	4.5
97	399,859	502	400,361	56.9	16,746.0	2.3	11,370	14,698	4,173	30,241	4.3
98	403,737	495	404,232	56.6	16,905.0	2.3	11,412	14,347	4,453	30,212	4.2
99	428,693	502	429,195	57.9	16,113.0	2.1	11,471	14,576	4,863	30,910	4.2
2000	433,256	502	433,758	58.1	15,747.0	2.1	11,373	14,678	4,936	30,987	4.2
01	420,881	482	421,363	57.3	15,865.0	2.1	11,463	14,661	5,104	31,228	4.2
02	429,981	707	430,688	57.8	11,188.0	1.5	3,473	14,853	15,424	33,750	4.5
03	430,493	697	431,190	57.8	10,954.0	1.4	3,264	14,492	16,135	33,891	4.5
04	458,271	574	458,845	58.3	10,378.0	1.3	3,235	13,989	16,487	33,711	4.3
05	455,365	503	455,868	57.6	10,023.0	1.3	3,373	13,630	16,891	33,894	4.3

(8) Trends in number of researchers by sector in Japan (continued)

Classification Year	Universities and colleges					Total (E)	Ratio (%) (D/E)
	National	Public	Private	Total (D)	Ratio (%) (D/E)		
1981	77,635	12,358	86,084	176,077	45.2	389,758	100
82	79,346	12,291	86,199	177,836	44.5	399,789	100
83	82,588	14,124	88,817	185,529	44.7	415,497	100
84	85,179	14,139	91,266	190,584	43.0	443,227	100
85	87,061	14,658	94,059	195,778	43.0	455,693	100
86	89,139	14,924	96,811	200,874	41.7	481,535	100
87	91,078	15,281	99,467	205,826	41.5	495,581	100
88	93,823	15,447	103,386	212,656	40.8	520,863	100
89	95,749	16,099	107,210	219,058	40.4	542,548	100
90	98,190	16,292	110,303	224,785	39.6	568,055	100
91	99,764	16,879	113,988	230,631	39.0	591,143	100
92	102,118	16,801	117,224	236,143	38.9	606,555	100
93	107,175	17,554	119,844	244,573	38.8	630,873	100
94	111,608	18,434	122,894	252,936	38.9	650,121	100
95	114,629	19,479	125,318	259,426	38.9	666,328	100
96	119,210	20,206	127,805	267,221	39.2	681,667	100
97	122,858	21,104	129,250	273,212	38.8	703,814	100
98	125,386	21,737	132,545	279,668	39.2	714,112	100
99	125,955	21,749	133,322	281,026	37.9	741,131	100
2000	125,796	22,090	133,479	281,365	37.7	746,110	100
01	126,749	21,974	133,560	282,283	38.4	734,874	100
02	126,673	21,978	132,059	280,710	37.7	745,148	100
03	128,159	22,217	130,928	281,304	37.7	746,385	100
04	131,081	21,963	131,286	284,330	36.1	787,264	100
05	133,989	22,266	134,892	291,147	36.8	790,932	100

- Notes: 1. The number of researchers includes those in the social sciences and humanities, and is as of April 1 of each year, except for 2002 and later, which are as of March 31.
2. Survey coverage categories were changed in 2002; figures for nonprofit organizations up to 2001 use the values for private research institutions.
3. Numbers up to 2001 are for researchers whose primary duty is research (except at universities and colleges, where the number includes those who conduct research as an additional post).
4. Until FY2000, public corporations and independent administrative institutions (a) were those which were operated on a self-paying basis. Since FY2001, they indicate those whose main productive activities are classified into "Industries" in the input-output table.
5. Until FY2000, public corporations and independent administrative institutions (b) were those which were not expected to operate on a self-paying basis. Since FY2001, they indicate those whose purpose is to carry out examinations and research on scientific technologies.
6. Some Industries were added as new survey targets in 1997 and 2002.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

**(9) R&D expenditures and number of researchers of companies, etc.
by industry in Japan (FY2004)**

Industry	Number of companies, etc. conducting research activities	Number of employees of companies, etc. conducting R&D activities	Number of researchers	R&D expenditures performed	R&D expenditures per researcher	Number of researchers per 10-thousand employees
	(companies)	(persons)	(persons)	(million yen)	(10 thousand yen)	(persons)
All industries	24,290	5,942,174	455,868	11,867,276	2,603	767
Agriculture, forestry and fisheries	17	8,111	190	4,900	2,579	234
Mining	17	8,011	437	14,150	3,238	545
Construction	1,820	369,588	5,403	123,288	2,282	146
Manufacturing	17,481	4,184,560	399,601	10,388,353	2,600	955
Food	1,332	427,232	12,706	281,784	2,218	297
Textile mill products	156	49,439	2,189	38,409	1,755	443
Pulp and paper	80	44,387	2,333	50,802	2,178	526
Printing	249	49,745	1,653	35,857	2,169	332
Drugs and medicines	670	195,646	20,836	906,749	4,352	1,065
Chemical products	1,440	278,605	35,188	831,287	2,362	1,263
Industrial chemicals and chemical fibers	495	141,236	17,183	479,917	2,793	1,217
Oils and paints	438	53,972	8,061	135,874	1,686	1,494
Other chemical products	507	83,396	9,945	215,497	2,167	1,193
Petroleum and coal	97	26,181	1,723	43,762	2,540	658
Plastic products	487	105,771	5,246	118,477	2,258	496
Rubber products	229	84,312	7,090	166,862	2,353	841
Ceramics	917	120,016	6,221	129,138	2,076	518
Iron and steel	216	123,242	4,607	135,087	2,932	374
Non-ferrous metals and products	132	72,645	5,476	139,773	2,552	754
Fabricated metal products	2,888	219,352	6,877	100,528	1,462	314
General machinery	2,388	478,534	42,907	991,033	2,310	897
Electrical machinery, equipment and supplies	1,966	401,962	45,578	1,009,382	2,215	1,134
Electronic and electric measuring instruments	853	89,624	15,053	265,532	1,764	1,680
Other electrical machinery equipment and supplies	1,113	312,338	30,525	743,850	2,437	977
Information and communication electronics equipment	1,242	380,263	85,756	2,099,408	2,448	2,255
Electronic parts and devices	1,205	285,438	33,624	679,007	2,019	1,178
Transportation	398	544,588	48,390	1,928,102	3,985	889
Motor vehicles	340	497,061	45,220	1,878,686	4,155	910
Other transportation equipment	58	47,527	3,170	49,416	1,559	667
Precision machinery	771	157,114	20,539	534,853	2,604	1,307
Other manufacturing	617	140,087	10,659	168,052	1,577	761
Electricity, gas, heat supply and water	44	167,771	1,947	67,871	3,486	116
Information and communications	2,756	661,485	28,872	613,722	2,126	436
Software and information processing	2,255	281,328	22,197	293,463	1,322	789
Communications	42	334,171	5,508	299,928	5,445	165
Broadcasting	14	19,627	317	13,603	4,291	162
Newspaper, publishers and other data processing	444	26,360	850	6,727	791	322
Transport	26	229,251	582	24,832	4,267	25
Wholesale trade	1,426	114,198	2,256	29,134	1,291	198
Finance and insurance	11	39,935	233	3,514	1,508	58
Services	693	159,264	16,347	597,513	3,655	1,026
Professional services	431	47,906	2,693	41,678	1,548	562
Scientific research institutes	224	24,888	13,292	550,533	4,142	5,341
Other business services	38	86,470	363	5,302	1,461	42

Notes: The number of companies conducting research activities is the number of companies that conducted research activities in FY2004. The number of researchers is as of March 31, 2005.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(10) Trends in ratio of company R&D expenditures to sales figures in Japan

Industry	(Unit: %)					Industry	(Unit: %)			
	FY	1997	98	99	2000		01	FY	2002	03	04
All industries		2.85	3.14	3.06	3.01	3.29	All industries	3.06	2.98	3.11
Agriculture, forestry and fisheries		0.53	0.63	0.59	0.58	0.54	Agriculture, forestry and fisheries	0.53	0.74	0.70
Mining		1.15	1.58	1.20	0.99	1.24	Mining	0.93	0.93	1.27
Construction		0.39	0.43	0.58	0.48	0.42	Construction	0.39	0.42	0.40
Manufacturing		3.67	3.89	3.68	3.70	4.03	Manufacturing	3.99	3.71	3.87
Food		1.00	1.05	0.93	1.01	0.96	Food	1.08	1.06	1.11
Textiles		1.77	1.59	2.17	2.17	1.87	Textile mill products	2.25	1.70	1.88
Pulp and paper products		0.92	1.12	1.06	0.98	1.09	Pulp and paper	1.16	1.16	1.28
Printing and publishing		1.06	1.13	1.24	1.14	1.07	Printing	1.35	1.26	1.23
Chemicals		5.24	5.49	5.37	5.36	5.73	Drugs and medicines	8.91	8.43	8.64
Industrial chemicals and chemical fibers		3.87	4.25	3.99	3.64	4.07	Chemical products	3.59	4.13	4.08
Oils and paints		4.57	4.25	4.47	4.43	4.71	Industrial chemicals and chemical fibers	3.90	3.66	3.75
Drugs and medicines		8.06	8.07	8.07	8.60	8.52	Oils and paints	4.13	4.34	4.16
Other chemicals		5.30	5.36	4.99	5.11	5.07	Other chemical products	2.95	5.13	5.00
Petroleum and coal products		0.49	0.48	0.32	0.24	0.26	Petroleum and coal	0.23	0.23	0.24
Plastic products		2.24	2.32	2.17	2.38	2.83	Plastic products	2.44	2.47	2.27
Rubber products		3.37	3.19	4.09	3.64	4.02	Rubber products	4.20	4.34	4.33
Ceramics		2.93	2.96	2.35	2.48	2.84	Ceramics	2.52	2.30	2.28
Iron and steel		1.92	2.01	1.88	1.64	1.67	Iron and steel	1.50	1.45	1.32
Non-ferrous metals and products		2.44	2.45	2.43	2.37	2.49	Non-ferrous metals and products	2.45	2.13	2.20
Fabricated metal products		1.46	1.52	1.41	1.70	1.49	Fabricated metal products	1.39	1.25	1.45
General machinery		3.41	3.76	3.96	3.93	4.16	General machinery	4.43	4.12	4.08
Electrical machinery		6.05	6.32	5.75	5.65	6.83	Electrical machinery, equipment and supplies	5.20	5.05	4.97
Electrical machinery, equipment and supplies		6.13	6.08	5.90	5.64	6.21	Electronic and electric measuring instruments	4.98	5.14	5.10
Communication and electrical equipment		6.01	6.43	5.69	5.65	7.09	Other electrical machinery equipment and supplies	5.26	5.02	4.92
Transport equipment		3.97	4.12	3.95	3.90	4.25	Information and communication electronics equipment	7.43	6.75	6.80
Motor vehicles		4.20	4.35	4.12	4.09	4.44	Electronic parts and devices	5.13	3.88	4.65
Other transport equipment		2.90	3.03	3.09	2.86	3.15	Transportation	4.35	4.40	4.56
Precision instruments		6.28	6.33	6.83	6.34	6.58	Motor vehicles	4.56	4.63	4.80
Other manufacturing		1.70	1.84	1.66	1.70	1.79	Other transportation equipment	1.87	1.69	1.55
Transport communication and public utility		0.91	0.80	1.11	1.15	1.14	Precision machinery	7.77	6.26	7.44
Wholesale trade		-	-	-	-	0.35	Other manufacturing	1.82	2.14	2.58
Software data processing		7.84	10.08	8.35	5.79	3.69	Electricity, gas, heat supply and water	0.44	0.41	0.37
Professional services		-	-	-	-	1.29	Information and communications	1.97	2.08	2.29
Miscellaneous business services		-	-	-	-	0.77	Software and information processing	2.41	3.13	4.09
Scientific research institutions		-	-	-	-	75.59	Communications	1.97	1.85	1.82
							Broadcasting	0.17	0.17	0.13
							Newspaper, publishers and other data processing	1.07	0.79	0.59
							Transport	0.29	0.24	0.27
							Wholesale trade	0.19	0.29	0.12
							Services	13.20	20.44	19.23
							Professional services	0.81	1.05	3.25
							Scientific research institutes	84.41	85.93	80.66
							Other business services	0.80	0.89	0.46

- Notes: 1. Figures are the ratios of individual company R&D expenditures to sales amounts.
2. Figures are for companies only, excluding public corporations, incorporated administrative agencies and finance and insurance.
3. Some industries were added as new survey targets in FY1996 and FY2001.
4. Information processing is not included in the "software and information processing" category up to FY2000.
5. Industrial classification has been changed since FY2002.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(11) Trends in Japan's technology trade amounts

(Unit: 100 million yen)

Year \ Classification	Export (A)	Import (B)	Ratio (A/B)
1981	1,063	3,775	0.28
82	1,392	4,369	0.32
83	1,351	4,707	0.29
84	1,651	5,401	0.31
85	1,724	5,631	0.31
86	1,527	5,454	0.28
87	1,870	5,515	0.34
88	2,099	6,429	0.33
89	2,782	7,347	0.38
90	3,590	8,744	0.41
91	3,860	8,135	0.47
92	3,875	9,106	0.43
93	4,296	7,998	0.54
94	5,294	8,476	0.62
95	5,668	8,881	0.64
96	7,257	10,684	0.68
97	8,839	11,634	0.76
98	9,659	11,706	0.83
99	9,310	11,213	0.83
2000	11,024	11,863	0.93
01	12,689	13,490	0.94
02	13,907	13,705	1.01
03	14,388	12,893	1.12
04	17,717	15,248	1.16

Notes: 1. Figures are values in each calendar year.

2. Method of figuring out has been changed since January 1996. Figures prior to 1991 have been revised based on the new method.

Source: The Bank of Japan. "Balance of Payments Monthly"

(12) Trends in technology trade amounts by industry in Japan

(1) Technology export amounts

(Unit: million yen)

Industry	Fiscal year											Composition ratio (%)	Ratio to the previous year	Percentage of receipts to R&D expenditures (%)
	1994	95	96	97	98	99	2000	01	02	03	04			
All industries	462,128	562,077	703,033	831,563	916,098	960,800	1,057,853	1,246,814	1,386,769	1,512,189	1,769,428	100	1.17	23.1
Construction	7,820	3,063	13,251	3,274	2,398	434	3,779	667	719	1,424	1,035	0.1	0.73	8.7
Manufacturing	452,585	556,414	686,629	824,476	908,200	955,450	1,047,860	1,213,310	1,367,092	1,490,356	1,742,216	98.5	1.17	23.4
Food	9,096	10,564	8,924	8,830	8,851	10,519	10,579	12,649	17,694	15,338	16,381	0.9	1.07	15.5
Textile mill products	3,635	4,396	22,384	5,284	3,651	3,851	2,362	2,663	2,535	1,473	1,854	0.1	1.26	8.0
Drugs and medicines	—	—	—	—	—	—	—	—	142,212	135,912	182,803	10.3	1.35	29.5
Chemical products	64,113	72,064	95,089	106,755	122,769	144,992	130,517	156,263	56,524	54,573	60,269	3.4	1.10	11.1
Ceramics	10,495	11,658	11,836	13,717	13,129	11,604	11,550	11,974	14,079	11,398	14,292	0.8	1.25	20.0
Iron and steel	12,845	16,923	20,940	15,319	11,932	11,544	13,436	9,601	9,570	6,598	8,114	0.5	1.23	7.2
Non-ferrous metals and products	4,418	4,315	5,149	5,738	6,252	5,538	5,728	4,863	8,015	7,688	16,765	0.9	2.18	20.1
Fabricated metal products	3,154	3,690	20,035	3,295	6,715	3,053	2,286	4,035	2,304	2,221	3,366	0.2	1.52	12.1
General machinery	20,262	22,081	22,444	29,727	31,616	29,377	35,275	50,347	45,946	53,766	88,655	5.0	1.65	16.9
Electrical machinery	140,477	215,022	233,257	246,008	237,757	204,473	211,358	239,886	—	—	—	—	—	—
Electrical machinery, equipment and supplies	—	—	—	—	—	—	—	—	45,448	55,408	66,225	3.7	1.20	10.3
Information and communication electronics equipment	—	—	—	—	—	—	—	—	135,954	145,051	186,436	10.5	1.29	10.4
Electronic parts and devices	—	—	—	—	—	—	—	—	61,157	51,060	51,438	2.9	1.01	13.3
Transportation	164,234	163,975	211,049	350,947	435,717	500,018	588,961	675,545	771,384	893,159	967,314	54.7	1.08	54.8
Precision machinery	5,633	8,467	10,397	8,890	8,426	9,262	7,729	13,523	11,141	5,999	23,489	1.3	3.92	5.8
Other manufacturing	14,223	23,259	25,125	29,966	21,385	21,219	28,079	31,960	43,129	50,712	54,815	3.1	1.08	16.3
Other	1,723	2,600	3,153	3,813	5,500	4,916	6,214	32,837	18,958	20,409	26,177	1.5	1.28	12.3

(2) Technology import amounts

(Unit: million yen)

Industry	Fiscal year											Composition ratio (%)	Ratio to the previous year	Percentage of receipts to R&D expenditures (%)
	1994	95	96	97	98	99	2000	01	02	03	04			
All industries	370,693	391,715	451,169	438,400	430,054	410,296	443,287	548,379	541,713	563,764	567,643	100	1.01	7.9
Construction	936	1,310	528	1,224	557	648	371	411	1,188	2,081	1,103	0.2	0.53	3.0
Manufacturing	367,843	388,257	439,097	430,420	406,251	388,068	423,002	488,708	473,294	486,439	496,869	87.5	1.02	7.0
Food	8,511	7,949	8,678	8,731	7,484	9,655	16,335	17,445	18,955	6,948	7,254	1.3	1.04	8.3
Textile mill products	7,829	8,087	10,561	6,889	4,849	4,050	4,450	3,585	2,045	1,931	1,878	0.3	0.97	17.7
Drugs and medicines	—	—	—	—	—	—	—	—	41,684	36,460	33,520	5.9	0.92	6.7
Chemical products	59,043	66,166	69,803	67,297	71,677	66,876	65,191	89,875	26,345	27,952	29,206	5.1	1.04	5.7
Ceramics	2,290	1,767	3,538	3,923	9,170	5,103	5,806	8,156	972	715	1,104	0.2	1.54	1.5
Iron and steel	2,342	4,187	3,020	5,210	4,880	2,419	2,269	2,242	2,013	804	1,009	0.2	1.25	1.0
Non-ferrous metals and products	2,707	4,084	4,629	15,701	3,694	3,227	5,823	44,132	41,158	54,403	26,544	4.7	0.49	31.6
Fabricated metal products	1,680	1,973	1,664	1,406	1,741	1,077	558	1,848	2,007	712	1,212	0.2	1.70	4.2
General machinery	23,270	21,066	23,295	21,932	23,581	28,775	38,841	30,615	49,485	53,669	67,989	12.0	1.27	13.7
Electrical machinery	177,382	199,746	222,324	218,942	204,999	202,274	216,367	223,006	—	—	—	—	—	—
Electrical machinery, equipment and supplies	—	—	—	—	—	—	—	—	33,761	31,357	40,751	7.2	1.30	6.2
Information and communication electronics equipment	—	—	—	—	—	—	—	—	151,645	151,130	189,146	33.3	1.25	9.9
Electronic parts and devices	—	—	—	—	—	—	—	—	45,626	50,726	33,680	5.9	0.66	7.8
Transportation	35,630	32,525	42,534	34,792	36,165	33,921	34,616	36,979	25,612	26,033	21,300	3.8	0.82	1.4
Precision machinery	10,618	11,911	12,836	15,085	9,742	6,759	7,731	14,354	12,749	18,846	23,798	4.2	1.26	6.0
Other manufacturing	36,541	28,796	36,215	30,512	28,269	23,932	25,015	16,471	19,237	24,753	18,478	3.3	0.75	6.6
Other	1,914	2,148	11,544	6,756	23,246	21,580	19,914	59,260	67,231	75,244	69,671	12.3	0.93	98.0

Notes: 1. "Other" is the value of total industry exports and imports minus the value of the manufacturing industry and construction industry exports and imports.

2. Some industries were added as new survey targets in FY1996 and FY2001.

3. Industrial classification has been changed since FY2002. The ratio to the previous year for chemicals is compared to the total for drugs and medicines and chemical products for FY2002 and to chemicals for 2001.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(13) Trends in technology trade amounts of Japan by region and country

(1) Technology export amounts

(Unit: 100 million yen)

FY Region and country	1994	95	96	97	98	99	2000	01	02	03	04	Composition ratio (%)	Ratio to the previous year
	Asia (excluding West Asia)	2,140.68	2,807.44	3,435.06	2,851.09	2,513.26	2,490.57	2,931.15	3,366.85	3,612.85	4,085.99	4,820.59	27.2	1.18
West Asia	23.14	15.34	18.58	26.45	20.74	23.04	42.56	57.58	71.77	76.63	143.34	0.8	1.87
North America	1,500.41	1,728.97	2,354.61	3,945.27	4,803.59	5,500.41	5,844.82	7,215.29	7,981.95	8,589.94	9,684.26	54.7	1.13
South America	49.52	47.80	83.10	82.83	87.00	64.17	108.99	95.00	84.75	118.19	133.53	0.8	1.13
Europe	810.04	943.37	1,070.47	1,245.95	1,550.39	1,373.80	1,480.68	1,556.08	1,933.93	2,025.52	2,625.42	14.8	1.30
Africa and Oceania	97.48	77.85	68.51	164.06	186.01	156.01	170.33	177.33	182.43	225.63	287.14	1.6	1.27
Total	4,621.27	5,620.77	7,030.33	8,315.65	9,160.99	9,608.00	10,578.53	12,468.13	13,867.69	15,121.89	17,694.28	100.0	1.17
South Korea	531	646	696	460	385	331	399	350	370	359	450	2.5	1.25
China	173	178	469	436	434	469	525	687	858	1139	1307	7.4	1.15
Taiwan	300	441	402	508	503	549	529	483	648	630	720	4.1	1.14
Indonesia	152	216	232	205	159	138	182	228	314	380	380	2.1	1.00
Thailand	362	462	513	415	304	354	547	696	652	826	1033	5.8	1.25
Singapore	265	284	408	289	251	180	211	210	176	166	251	1.4	1.51
USA	1393	1606	2082	3653	4260	4691	4805	5856	6341	6785	7754	43.8	1.14
Brazil	35	37	61	52	46	32	71	53	51	82	90	0.5	1.10
UK	442	413	459	578	753	609	660	546	717	775	984	5.6	1.27
Italy	27	49	61	61	60	50	56	69	134	129	115	0.6	0.89
Russia	2	1	1	—	—	—	2	2	2	1	13	0.1	13.98
Germany	92	139	136	137	154	159	131	190	272	206	319	1.8	1.55
France	101	148	155	144	170	159	186	239	246	266	311	1.8	1.17
Australia	53	20	19	65	104	95	90	103	109	127	182	1.0	1.43

(2) Technology import amounts

(Unit: 100 million yen)

FY Region and country	1994	95	96	97	98	99	2000	01	02	03	04	Composition ratio (%)	Ratio to the previous year
	North America	2,618.70	2,793.09	3,305.47	3,135.17	3,061.49	2,915.56	3,314.45	3,743.35	3,679.45	3,818.16	4,117.45	72.5	1.08
Europe	1,077.08	1,097.44	1,160.94	1,198.38	1,185.42	1,135.90	1,051.06	1,691.61	1,672.70	1,711.33	1,402.11	24.7	0.82
Other	11.16	26.62	45.28	50.45	53.63	51.50	67.36	48.83	64.99	108.15	156.87	2.8	1.45
Total	3,706.94	3,917.15	4,511.69	4,384.00	4,300.54	4,102.96	4,432.87	5,483.79	5,417.13	5,637.64	5,676.43	100.0	1.01
USA	2,605	2,776	3,285	3,110	3,038	2,896	3,294	3,706	3,655	3,798	4,098	72.2	1.08
UK	125	121	134	116	130	153	134	321	243	264	241	4.2	0.91
Italy	17	25	18	16	16	14	16	24	27	69	42	0.7	0.61
Netherlands	218	234	242	237	268	219	184	170	327	118	150	2.6	1.27
Switzerland	204	205	173	179	185	164	194	196	185	169	98	1.7	0.58
Germany	211	194	248	271	229	211	199	226	213	204	228	4.0	1.12
France	174	189	201	202	166	163	149	551	557	691	440	7.7	0.64

Note: Some Industries were added as new survey targets in FY1996 and FY2001.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(14) Japan's technology trade amounts by industry and region (FY 2004)

(Unit: million yen)

Item	Export amounts							Import amounts			
	Total	Asia (excluding West Asia)	West Asia	North America	South America	Europe	Other	Total	North America	Europe	Other
All industries	1,769,428	482,059	14,334	968,426	13,353	262,542	28,714	567,643	411,745	140,211	15,687
Construction	1,035	434	-	355	-	245	-	1,103	99	995	10
Manufacturing	1,742,216	462,515	14,299	963,404	12,874	260,444	28,680	496,869	353,521	129,947	13,401
Food	16,381	5,616	-	4,018	2,109	4,549	89	7,254	5,890	1,350	14
Textile mill products	1,854	1,155	-	656	-	43	-	1,878	4	1,874	-
Pulp and paper	1,817	600	-	325	134	758	-	77	60	17	-
Printing	5,965	5,790	-	129	-	46	-	806	255	543	8
Drugs and medicines	182,803	1,207	171	117,301	9	64,114	1	33,520	13,845	19,048	627
Chemical products	60,269	33,875	215	11,866	126	13,379	809	29,206	23,489	5,657	64
Petroleum and coal	580	318	3	95	7	152	5	1,604	779	815	9
Plastic products	9,420	7,280	30	963	-	1,013	136	1,677	1,184	451	42
Rubber products	32,011	7,871	649	13,316	1,099	7,686	1,390	3,651	2,813	676	162
Ceramics	14,292	10,252	19	1,862	249	1,605	306	1,104	138	955	11
Iron and steel	8,114	5,023	259	1,135	536	932	229	1,009	775	206	28
Non-ferrous metals and products	16,765	14,295	-	1,793	5	626	46	26,544	722	25,818	4
Fabricated metal products	3,366	2,245	-	948	13	134	27	1,212	754	391	67
General machinery	88,655	31,034	19	34,057	105	22,359	82	67,989	51,330	11,171	5,489
Electrical machinery, equipment and supplies	66,225	28,261	85	30,590	345	6,122	823	40,751	33,952	6,354	445
Information and communication electronics equipment	186,436	101,383	21	50,041	621	34,181	189	189,146	148,636	35,918	4,592
Electronic parts and devices	51,438	40,967	13	8,416	108	1,929	5	33,680	29,941	2,436	1,303
Transportation	967,314	161,366	12,815	681,081	7,405	80,308	24,339	21,300	10,495	10,728	77
Precision machinery	23,489	3,306	-	2,308	3	17,872	-	23,798	19,260	4,096	442
Other manufacturing	5,020	670	-	2,507	0	1,636	206	10,644	9,204	1,444	16
Other	26,177	19,110	35	4,667	479	1,853	34	69,671	58,125	9,269	2,277

Notes: 1. "-" indicates figure is not applicable.

2. "Other" is the value of total industry exports and imports minus the value of the manufacturing industry and construction industry exports and imports.

Source: Statistics Bureau, Ministry of Internal Affairs and Communications. "Report on the Survey of Research and Development"

(15) Deflators

Sector	R&D expenditure deflators in Japan					GDP deflators									
	Overall (including social science and humanities)					Natural sciences	Japan	USA	Germany	France	UK	EU-15	EU-25	South Korea	China
	Business enterprises	Non-profit institutions and public organizations	Universities and colleges	Total	Year										
1981	81.5	83.8	73.5	81.5	83.3	83.2	59.1	66.3	54.0	44.4			33.0		
82	84.2	86.1	76.2	84.2	85.8	85.0	62.7	69.4	60.3	47.7			35.2		
83	85.6	87.2	78.0	85.6	87.0	87.0	65.1	71.7	66.1	50.3			37.4		
84	88.1	89.5	80.6	88.1	89.5	89.8	67.6	73.1	70.8	52.6			39.6		
85	89.7	90.7	82.5	89.7	90.8	91.9	69.7	74.7	74.6	55.5			41.5		
86	87.9	89.1	82.6	87.9	88.7	93.4	71.2	77.2	78.3	57.4			43.8		
87	88.5	89.7	83.8	88.5	89.3	93.7	73.2	78.5	80.6	60.4			46.3		
88	90.7	91.8	86.7	90.7	91.4	94.4	75.7	79.7	83.2	64.2			49.8		
89	94.8	96.0	90.8	94.8	95.4	96.6	78.6	81.6	86.0	69.0			52.7		
90	97.8	99.3	94.2	97.8	98.3	98.9	81.6	84.2	87.8	74.2			58.2	54.3	
91	99.5	100.9	96.7	99.5	99.9	101.8	84.5	87.2	89.9	79.1			64.4	57.9	
92	100.0	101.3	97.8	100.0	100.3	103.4	86.4	91.5	91.6	82.3			69.3	62.5	
93	99.7	100.9	98.3	99.7	99.9	104.0	88.4	94.9	93.2	84.5			73.7	71.6	
94	100.3	101.3	99.6	100.3	100.5	104.1	90.3	97.2	94.6	85.8			79.5	85.9	
95	100.7	101.6	100.4	100.7	100.8	103.5	92.1	99.0	95.6	88.1	88.7	88.1	85.4	97.2	
96	101.9	102.5	102.0	101.9	102.0	102.7	93.8	99.5	97.2	91.1	91.5	91.1	89.8	102.9	
97	102.9	103.4	102.8	102.9	102.9	103.1	95.4	99.8	98.0	93.6	93.8	93.5	93.9	103.8	
98	100.9	101.5	100.9	100.9	100.9	102.9	96.5	100.3	98.8	96.4	95.3	95.1	99.4	101.3	
99	99.7	100.2	99.8	99.7	99.7	101.5	97.9	100.7	98.7	98.6	97.3	97.0	99.3	99.1	
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
01	98.2	98.1	98.4	98.2	98.2	98.7	102.4	101.2	101.8	102.2	101.7	102.0	103.5	101.2	
02	96.3	96.2	96.1	96.3	96.3	97.4	104.2	102.7	104.0	105.6	104.2	104.5	106.5	101.0	
03	95.8	95.5	95.5	95.8	95.8	96.1	106.3	103.7	105.6	109.0	104.6	104.8	109.4	103.0	
04	96.2	95.9	95.4	96.2	96.2	95.0	109.1	104.5	107.3	111.2	106.9	107.1	112.3	109.5	

Notes: 1. Figures serves as the base year for deflator with a value of 100.

2. The R&D expenditures deflator in Japan uses a fiscal year value.

3. The deflator value for non-profit institutions and public organizations in Japan up to FY2000 is the figure for research institutions.

Sources: R&D expenditure deflators in Japan: Statistics Bureau data

GDP deflators in EU-15 and EU-25 -- Download from Database on Eurostat; Others -- OECD "Main Science and Technology Indicators 2005-2"