



TABLE OF CONTENTS

Volume II

STATISTICAL APPENDIX	S-1
METHODOLOGICAL APPENDIX	M-1
GLOSSARY	G-1

STATISTICAL ANNEX

Contents List

PART A: Science and Technology Indicators

A.1 Government R&D Appropriations

Table A.1.1	Government R&D Appropriations (GBAORD) by socio-economic objective
Table A.1.2	Government R&D Appropriations (GBAORD) by socio-economic objective (European Commission)

A.2 R&D Expenditure

Table A.2.1	Gross Domestic Expenditure on R&D (GERD)
Table A.2.2	Business Enterprise Sector Expenditure on R&D (BERD)
Table A.2.3	Business Enterprise Sector Expenditure on R&D by Region (BERDR)
Table A.2.4	Government Sector Expenditure on R&D (GOVERD)
Table A.2.5	Higher Education Sector Expenditure on R&D (HERD)
Table A.2.6	R&D Expenditure Financed by the Business Enterprise Sector
Table A.2.7	R&D Expenditure Financed by the Government Sector
Table A.2.8	R&D Expenditure Financed by Foreign Funds

A.3 R&D Personnel

Table A.3.1	Total R&D Personnel
Table A.3.2	Total Business Enterprise R&D Personnel
Table A.3.3	Total Government R&D Personnel
Table A.3.4	Total Higher Education R&D Personnel
Table A.3.5	Total Scientists and Engineers (RSEs)
Table A.3.6	Business Enterprise Scientists and Engineers
Table A.3.7	Business Enterprise Scientists and Engineers by Region
Table A.3.8	Government Scientists and Engineers
Table A.3.9	Higher Education Scientists and Engineers

A.4 Graduates

Table A.4.1	Number of Graduates of Higher Education
Table A.4.2	Number of Graduates of Higher Education by Field of Study
Table A.4.3	Number of PhD Graduates

A.5 Bibliometric Indicators

Table A.5.1	Number of Scientific Publications
Table A.5.2	Number of Scientific Publications by Field of Science
Table A.5.3	Number of Citations
Table A.5.4	Number of Citations by Field of Science

A.6 Patent Indicators

Table A.6.1	Number of EPO Patent Applications by Priority Year
Table A.6.2	Number of EPO Patent Applications by Publication Year
Table A.6.3	Number of EPO Patent Applications by Selected Economic Activity by Publication Year
Table A.6.4	Number of European Patent Applications by Region and by Year of Filing
Table A.6.5	Number of USPTO Granted Patents by Priority Year
Table A.6.6	Number of USPTO Granted Patents by Publication Year
Table A.6.7	Number of USPTO Granted Patents by Selected Economic Activity by Publication Year
Table A.6.8	Number of National Patents in Mediterranean countries

A.7 External Trade in High-Tech Products

Table A.7.1	Total Imports in High-Tech Products
Table A.7.2	Total Imports in High-Tech Products by Product Group
Table A.7.3	Total Exports in High-Tech Products
Table A.7.4	Total Exports in High-Tech Products by Product Group
Table A.7.5	Total Imports and Exports in High-Tech Products between Country Groups

A.8 Technology Balance of Payments

Table A.8.1	Technology Balance of Payments (TBP) - Receipts
Table A.8.2	Technology Balance of Payments (TBP) - Payments

A.9 Innovation Indicators

Table A.9.1	General Information on Innovation
Table A.9.2	Sources of Information for Innovation
Table A.9.3	Objectives of Innovation
Table A.9.4	Factors Hampering Information

A.10 R&D Co-operation in Europe

Table A.10.1	Trends in Community Commitments for RTD
Table A.10.2	Changes in RTD Priorities Between Framework Programmes
Table A.10.3	Third Framework Programme - Shared Cost Actions: Summary by Specific Programme
Table A.10.4	Fourth Framework Programme - Shared Cost Actions: Summary by Specific Programme
Table A.10.5	Third Framework Programme - Shared Cost Actions: Total Participations for Each Specific Programme by Type of Participant
Table A.10.6	Fourth Framework Programme - Shared Cost Actions: Total Participations for Each Specific Programme by Type of Participant
Table A.10.7	Third Framework Programme - Shared Cost Actions: European Commission Contractual Funding for Each Specific Programme by Type of Participant
Table A.10.8	Fourth Framework Programme - Shared Cost Actions: European Commission Contractual Funding for Each Specific Programme by Type of Participant
Table A.10.9	Expenditures of 12 European Collaborative Programmes
Table A.10.10	Fellowship Schemes Survey
Table A.10.11	Inter-Enterprise Alliances: Partnership between Countries
Table A.10.12	Inter-Enterprise Alliances: Technology Alliances
Table A.10.13	Inter-Enterprise Alliances: Development Alliances by Country

PART B: General Economic Indicators**B.1 Macro-economic Indicators**

Table B.1.1	Gross Domestic Product (GDP)
Table B.1.2	Gross Fixed Capital Formation (GFCF)

B.2 Price Indices

Table B.2.1	Implicit GDP Price Index
Table B.2.2	Consumer Price Index (CPI)

B.3 Exchange Rates

Table B.3.1	European Currency Unit (ECU)
Table B.3.2	Purchasing Power Standard (PPS)

B.4 Population

Table B.4.1	Population
Table B.4.2	15 to 19 Year Old Population as a % of total population
Table B.4.3	Projections of Total Population

B.5 Labour Force

Table B.5.1	General Level of Employment
Table B.5.2	General Level of Unemployment
Table B.5.3	Educational Attainment

B.6 External Trade in Goods

Table B.6.1	External Trade in Goods: Import
Table B.6.2	External Trade in Goods: Export
Table B.6.3	Total Imports and Exports between Country Groups

B.7 Direct Investment

Table B.7.1	Total Inward Flows of Direct Investment
Table B.7.2	Total Outward Flows of Direct Investment
Table B.7.3	Geographical Breakdown of Total EU Flows of International Direct Investment in 1994
Table B.7.4	Geographical Breakdown of Total USA Flows of International Direct Investment in 1994
Table B.7.5	Geographical Breakdown of Total Japan Flows of International Direct Investment in 1994

Symbols used

..	no data available
<i>615</i>	numbers in italic indicate estimates
-	zero
0	less 0.5 unit
|	Break in series

Table A.1.1: Government R&D Appropriations (GBAORD) by Socio-Economic Objective

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996
European Union (EU) a	33 723	44 399	48 609	50 131	49 740	48 560	47 149	47 447	45 400
Human and social objectives	3 759	4 302	5 213	5 488	5 488	5 415	5 246	5 233	5 600
Technological objectives	9 032	12 944	12 266	12 076	11 842	10 962	10 488	10 058	9 200
Agriculture	1 409	1 682	1 735	1 998	1 820	1 772	1 739	1 609	1 700
Research financed from GUF	7 496	9 955	11 764	12 722	14 065	13 831	14 060	14 326	13 700
Non-oriented research	3 711	4 852	5 985	6 490	6 029	6 679	6 267	6 451	6 300
Other civil research	200	410	545	656	718	627	708	682	800
Defence	8 117	10 162	11 101	10 703	9 778	9 273	8 640	8 736	8 000
B	726	798	922	947	934	978	976	1 007	1 073
Human and social objectives	57	52	54	73	65	64	63	74	93
Technological objectives	265	300	278	276	266	288	285	305	295
Agriculture	57	56	47	48	47	42	41	35	45
Research financed from GUF	186	177	315	318	320	343	342	338	373
Non-oriented research	147	179	188	188	188	188	189	193	188
Other civil research	11	22	36	42	45	50	54	58	74
Defence	3	12	4	2	2	2	2	3	5
DK	292	406	596	602	557	533	575	641	635
Human and social objectives	70	46	74	83	77	85	101	117	113
Technological objectives	82	130	127	126	112	101	108	112	104
Agriculture	26	30	46	50	42	6	39	49	45
Research financed from GUF	..	126	210	198	188	190	198	223	244
Non-oriented research	..	72	136	140	136	147	126	137	126
Other civil research	..	-	-	-	-	-	-	-	-
Defence	1	2	3	3	3	3	3	3	3
D b	10 048	10 781	11 164	12 597	12 613	12 256	11 821	11 837	11 984
Human and social objectives	1 353	1 120	1 277	1 403	1 415	1 367	1 312	1 269	1 300
Technological objectives	3 159	3 535	2 981	3 200	3 433	3 085	2 914	2 866	2 854
Agriculture	187	214	216	400	318	318	313	308	307
Research financed from GUF	..	3 389	3 636	4 178	4 440	4 544	4 479	4 467	4 467
Non-oriented research	..	1 228	1 464	1 911	1 696	1 877	1 711	1 779	1 786
Other civil research	..	9	86	122	46	20	80	76	89
Defence	1 020	1 286	1 504	1 384	1 265	1 044	1 012	1 072	1 180
EL	87	144	196	189	169	183	198	278	301
Human and social objectives	16	25	30	27	23	28	27	36	42
Technological objectives	14	24	34	32	25	31	28	54	64
Agriculture	22	39	34	30	23	24	24	30	33
Research financed from GUF	13	41	81	87	84	83	95	127	129
Non-oriented research	17	9	9	7	8	13	21	27	29
Other civil research	-	3	3	3	3	1	0	0	0
Defence	6	4	4	3	2	4	4	3	4
E	704	1 269	2 360	2 357	2 282	2 177	2 166	2 305	2 127
Human and social objectives	63	100	307	256	213	218	202	218	211
Technological objectives	234	467	686	768	759	721	703	768	688
Agriculture	74	93	124	139	110	112	110	99	87
Research financed from GUF	177	271	412	474	545	545	698	746	720
Non-oriented research	115	231	270	257	239	263	183	195	144
Other civil research	5	27	104	65	80	44	40	38	39
Defence	36	81	457	398	336	275	231	241	237
F	8 149	11 306	12 653	12 662	12 021	11 620	11 424	10 769	10 773
Human and social objectives	887	1 145	700	704	833	844	809	902	932
Technological objectives	2 122	3 061	3 134	3 306	2 641	2 588	2 517	2 257	2 273
Agriculture	318	401	504	526	466	459	446	373	386
Research financed from GUF	..	1 348	1 478	1 574	1 619	1 612	1 638	1 687	1 721
Non-oriented research	..	1 628	1 914	1 931	2 020	2 085	2 037	2 086	2 068
Other civil research	36	188	48	53	164	161	201	205	270
Defence	2 974	3 536	4 874	4 568	4 277	3 870	3 777	3 259	3 124

Table A.1.1: Government R&D Appropriations (GBAORD) by Socio-Economic Objective (continued)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996
IRL	119	114	108	117	128	138	131	179	196
Human and social objectives	33	19	19	19	20	20	26	30	28
Technological objectives	11	34	38	45	50	60	31	62	65
Agriculture	31	25	13	13	14	14	17	28	29
Research financed from GUF	22	32	33	35	38	39	53	52	68
Non-oriented research	23	4	5	6	6	5	5	7	7
Other civil research	-	-	-	-	-	-	-	-	-
Defence	-	-	-	-	-	-	-	-	-
I	2 765	4 867	6 340	6 552	7 013	5 988	5 540	5 624	..
Human and social objectives	243	380	949	1 135	984	818	693	772	..
Technological objectives	1 346	2 366	2 077	1 755	1 982	1 450	1 317	1 175	..
Agriculture	115	185	186	186	176	154	133	122	..
Research financed from GUF	..	1 055	1 892	2 052	2 515	2 312	2 245	2 362	..
Non-oriented research	..	367	691	695	611	536	467	513	..
Other civil research	..	30	156	211	250	207	194	175	..
Defence	74	483	389	518	495	511	492	505	..
L	..	..	..	..	..	..	..	..	..
NL	1 785	1 774	2 026	1 947	1 956	1 924	1 907	1 954	1 924
Human and social objectives	292	230	268	292	296	317	278	246	234
Technological objectives	320	406	596	511	515	424	403	391	392
Agriculture	162	78	89	104	89	91	94	92	94
Research financed from GUF	731	751	674	639	643	676	718	807	791
Non-oriented research	191	178	239	242	251	247	250	235	231
Other civil research	41	77	92	92	90	101	97	120	118
Defence	48	54	68	67	71	68	67	63	64
A	461	564	664	771	796	849	915	897	873
Human and social objectives	22	30	49	64	68	67	95	80	71
Technological objectives	76	58	67	91	83	82	101	89	84
Agriculture	19	25	26	26	29	30	30	29	30
Research financed from GUF	293	382	442	493	515	549	580	581	570
Non-oriented research	52	69	78	95	99	120	108	117	117
Other civil research	-	0	1	1	2	1	1	1	1
Defence	0	0	0	0	0	0	0	0	0
P	..	164	291	361	396	504	407	467	467
Human and social objectives	..	..	45	64	69	90	69	73	71
Technological objectives	..	..	77	101	116	135	101	60	59
Agriculture	..	..	43	53	48	59	45	50	49
Research financed from GUF	..	..	101	106	111	156	140	219	216
Non-oriented research	..	..	17	16	37	47	35	53	61
Other civil research	..	..	5	18	13	14	10	6	6
Defence	..	..	2	3	1	4	7	6	6
FIN	306	434	615	673	702	719	715	731	708
Human and social objectives	32	49	85	118	123	115	110	116	118
Technological objectives	103	168	245	225	247	284	289	282	255
Agriculture	36	40	51	60	61	57	51	52	51
Research financed from GUF	99	114	169	190	188	174	173	193	195
Non-oriented research	27	43	56	71	72	74	77	73	75
Other civil research	2	13	-	-	-	-	-	0	0
Defence	6	8	9	10	11	15	15	15	14
S	1 337	1 510	1 628	1 694	1 684	1 668	1 605	1 638	..
Human and social objectives	231	208	328	261	254	248	299	266	..
Technological objectives	278	270	163	178	175	146	152	172	..
Agriculture	26	30	31	30	31	28	20	28	..
Research financed from GUF	..	418	511	515	814	620	628	640	..
Non-oriented research	..	221	210	247	-	235	204	189	..
Other civil research	..	-	-	-	-	-	-	-	..
Defence	203	363	385	463	410	392	303	342	..

Table A.1.1: Government R&D Appropriations (GBAORD) by Socio-Economic Objective (continued)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996
UK	6 905	8 245	7 509	7 131	6 886	7 136	6 765	7 083	6 909
Human and social objectives	..	650	825	776	856	986	981	1 430	1 395
Technological objectives	..	1 684	1 385	1 136	1 052	1 112	1 068	584	569
Agriculture	..	405	300	301	350	367	343	358	349
Research financed from GUF	..	1 333	1 271	1 312	1 315	1 224	1 324	1 294	1 262
Non-oriented research	..	366	433	402	454	369	390	830	810
Other civil research	..	25	17	51	33	45	29	31	31
Defence	3 745	3 782	3 280	3 154	2 826	3 032	2 630	2 555	2 493
European Free Trade Association (EFTA)									
IS	..	18	..	26	20	32	35	38	38
Human and social objectives	..	1	..	2	2	..	..	..	..
Technological objectives	..	5	..	3	3	..	..	..	..
Agriculture	..	6	..	9	5	..	..	..	..
Research financed from GUF	..	..	..	6	6	..	..	..	..
Non-oriented research	..	..	..	4	4	..	..	..	..
Other civil research	..	..	..	-	-	..	..	..	..
Defence	..	0	..	0	0	..	..	..	..
NO	416	480	730	746	838	837	846	829	844
Human and social objectives	88	103	148	156	169	170	167	147	150
Technological objectives	92	92	161	162	182	194	184	185	174
Agriculture	38	49	76	74	86	85	85	82	83
Research financed from GUF	150	153	234	242	279	281	303	301	316
Non-oriented research	29	34	67	70	79	64	65	74	78
Other civil research	-	-	-	-	-	-	-	-	-
Defence	19	49	43	42	43	43	42	41	42
CH cd	378	..	455	465	487	..	..	..	..
Human and social objectives	..	..	82	95	..	..	..	..	..
Technological objectives	..	..	52	56	..	..	..	..	..
Agriculture	..	..	45	43	..	..	..	..	..
Research financed from GUF	..	..	-	-	..	..	..	..	..
Non-oriented research	..	..	182	185	..	..	..	..	..
Other civil research	..	..	2	0	..	..	..	..	..
Defence	59	..	91	86	..	..	..	..	..
Central European Free Trade Association (CEFTA)									
CZ	..	..	..	..	..	328	311	322	372
SK	..	..	..	..	..	164	115	132	..
Human and social objectives	..	..	..	..	..	34	21	22	..
Technological objectives	..	..	..	..	..	38	28	14	..
Agriculture	..	..	..	..	..	27	17	24	..
Research financed from GUF	..	..	..	..	..	18	14	16	..
Non-oriented research	..	..	..	..	..	43	30	38	..
Other civil research	..	..	..	..	..	-	-	-	..
Defence	..	..	..	..	..	4	4	6	..
HU	..	..	..	..	..	..	..	..	..
PL e	..	..	..	990	856	809	868	842	..
Other European Countries									
BG	..	..	..	163	193	127	106	91	..
RO f	..	..	..	442	413	437	355	373	..
RU eg	..	..	..	15 562	6 737	5 978	3 793	2 972	..
Human and social objectives	..	..	..	..	..	..	475	335	..
Technological objectives	..	..	..	..	..	..	919	981	..
Agriculture	..	..	..	..	..	..	829	218	..
Research financed from GUF	..	..	..	..	..	..	-	-	..
Non-oriented research	..	..	..	..	..	..	383	269	..
Other civil research	..	..	..	..	..	..	3	1	..
Defence	..	..	..	..	..	..	1 185	1 168	..

Table A.1.1: Government R&D Appropriations (GBAORD) by Socio-Economic Objective (continued)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996
UA e	..	..	..	..	..	512	617	464	..
TR	..	..	..	..	..	..	..	..	..
North American Free Trade Association (NAFTA)									
	46 500	59 100	62 825	62 847	63 343	63 498	60 995	58 100	57 000
Human and social objectives	8 900	8 900	10 695	11 483	12 268	12 300	12 792	12 400	12 300
Technological objectives	10 800	7 200	9 461	10 370	10 530	10 341	10 903	10 700	10 000
Agriculture	1 700	1 800	1 734	1 840	1 807	1 838	1 906	1 800	1 700
Research financed from GUF	800	800	875	916	894	890	919	900	900
Non-oriented research	2 300	2 700	2 820	2 980	2 906	2 950	2 887	2 800	2 800
Other civil research	-	-	-	-	-	-	-	-	-
Defence	22 000	37 700	37 178	35 257	34 938	35 179	31 587	29 500	29 300
CA d	2 156	2 853	2 955	3 100	3 124	3 146	3 144	2 878	..
Human and social objectives	353	490	530	569	579	611	633	581	..
Technological objectives	395	583	698	897	928	953	924	799	..
Agriculture	394	481	406	426	406	421	416	398	..
Research financed from GUF	484	559	594	599	581	559	567	557	..
Non-oriented research	404	545	455	433	443	431	434	405	..
Other civil research	0	0	63	0	0	0	-	-	..
Defence	126	195	210	175	187	171	170	138	..
MX d	..	..	813	965	920	1 041	1 005	..	..
Human and social objectives	..	..	87	113	195	134	108	..	..
Technological objectives	..	..	167	184	184	279	288	..	..
Agriculture	..	..	145	154	69	62	60	..	..
Research financed from GUF	..	..	281	317	313	331	353	..	..
Non-oriented research	..	..	134	197	158	235	196	..	..
Other civil research	..	..	-	-	-	-	-	..	..
Defence	..	..	-	-	-	-	-	..	..
US cde	43 551	55 452	59 056	58 782	59 299	59 310	56 846	54 209	53 294
Human and social objectives	8 492	8 297	10 078	10 801	11 494	11 555	12 051	11 722	11 640
Technological objectives	10 280	6 443	8 596	9 289	9 418	9 109	9 692	9 604	8 982
Agriculture	1 114	1 186	1 183	1 260	1 331	1 355	1 430	1 364	1 306
Research financed from GUF	-	-	-	-	-	-	-	-	-
Non-oriented research	1 803	2 070	2 231	2 350	2 305	2 284	2 256	2 202	2 208
Other civil research	-	-	-	-	-	-	-	-	-
Defence	21 863	37 457	36 968	35 082	34 751	35 008	31 417	29 318	29 160
Developed Asian Economies									
JP h	..	..	9 104	9 334	9 691	10 219	10 605	11 282	12 061
Human and social objectives	..	..	533	584	611	646	681	729	782
Technological objectives	..	..	3 139	3 167	3 237	3 411	3 490	3 701	3 836
Agriculture	..	..	332	339	346	365	372	386	408
Research financed from GUF	..	..	3 885	3 968	4 118	4 288	4 464	4 679	4 946
Non-oriented research	..	..	720	745	802	890	965	1 090	1 342
Other civil research	..	..	-	-	-	-	-	-	-
Defence	..	..	494	531	576	619	633	697	746
Oceania									
AU d	1 423	1 402	1 446	1 591	1 686	1 752	1 791	..	..
Human and social objectives	147	216	151	173	182	190	182	..	..
Technological objectives	283	313	270	310	340	347	378	..	..
Agriculture	340	156	135	143	152	159	158	..	..
Research financed from GUF	338	392	433	458	491	517	533	..	..
Non-oriented research	172	198	304	352	371	390	400	..	..
Other civil research	-	-	-	-	-	-	-	..	..
Defence	143	127	153	154	150	149	139	..	..

Table A.1.1: Government R&D Appropriations (GBAORD) by Socio-Economic Objective (continued)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996
NZ	228	230	223	221	..	..	..
Human and social objectives	25	27	27	27	..	..	..
Technological objectives	66	66	58	61	..	..	..
Agriculture	78	77	67	67	..	..	..
Research financed from GUF	52	51	51	45	..	..	..
Non-oriented research	2	2	2	3	..	..	..
Other civil research	3	3	14	14	..	..	..
Defence	3	4	4	4	..	..	..

Notes*italics* Data are provisional*a* Excluding Luxembourg; data for 1980 and 1996 are estimations*b* Break in series because of unification*c* Excludes data for the R&D content of general payment to the higher education sector for combined education and research (public GUF)*d* Federal or central government only*e* Excludes most or all capital expenditure*f* For 1991-94, appropriations on current R&D expenditures only*g* The 1995 figure including capital expenditure would be 3137*h* Excluding R&D in the social sciences and humanities**Source: EU plus Norway****Other OECD countries****Eastern European countries****Eurostat, but 1980 data from OECD****OECD****national sources**

Second European Report on S&T Indicators, 1997

Table A.1.2: Government R&D Appropriations (GBAORD) by Socio-Economic Objective (European Commission)Million ECU *ab*

	1980	1985	1990	1991	1992	1993	1994	1995	1996
European Commission	284	573	1 314	1 646	1 762	2 047	2 026	2 298	2 591
Human and social objectives	..	62	142	209	272	443	398	461	574
Technological objectives	..	487	1 040	1 261	1 177	1 253	1 170	1 365	1 439
Agriculture	..	16	47	69	97	100	115	124	149
Research financed from GUF	..	-	-	-	-	-	-	-	-
Non-oriented research	..	8	40	49	97	21	22	42	174
Other civil research	..	-	45	58	119	230	321	305	256
Defence	..	-	-	-	-	-	-	-	-

Notes*a* Data are in current prices due to the lack of an appropriate deflator*b* Administrative costs are not included**Source: Eurostat DG XII-AS-4**

Second European Report on S&T Indicators, 1997

Table A.2.1: Gross Domestic Expenditure on R&D (GERD)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU) a										
	64 900	83 000	101 400	102 800	102 400	102 100	101 900	102 800	103 800	
B b	1 835	2 179	..	2 561	..	2 480	2 517	2 610	..	(i)
DK c	672	917	1 279	1 358	1 390	1 455	..	1 587	..	(i, ii)
D d	..	25 689	29 655	31 876	30 963	29 963	29 549	29 487	29 431	(i)
DD efg	2 817	3 690	..	..	..	..	..	..	..	(iii)
EL	..	193	..	328	..	429	..	..	..	(i, ii)
E	1 359	1 883	3 618	3 803	4 006	3 966	3 750	3 638	3 544	(i)
F	13 367	17 752	22 073	22 174	22 527	22 571	22 416	22 538	..	(i, ii)
IRL	..	244	318	366	423	501	596	689	..	(i, ii)
I h	5 170	8 365	11 134	10 737	10 435	10 120	9 349	9 456	9 432	(i, ii)
L	..	..	..	..	..	..	..	..	..
NL	3 318	3 911	4 767	4 645	4 572	4 667	4 907	..	..	(i, ii)
A	..	1 284	1 690	1 842	1 848	1 883	2 002	2 036	2 030	(i, ii)
P	185	..	466	..	581	..	..	553	..	(i, ii)
FIN	..	1 002	1 429	1 440	1 461	1 466	1 620	1 707	..	(i, ii)
S	..	3 477	..	3 850	..	4 109	..	4 745	..	(i)
UK e	..	15 856	18 251	17 322	17 320	17 938	18 273	18 203	..	(i)
European Free Trade Association (EFTA)										
	3 500	4 500	5 300	5 300	5 200	5 300	..	..	..
IS	..	27	44	52	58	58	63	67	72	(ii)
NO	681	1 026	..	1 265	..	1 407	..	1 399	..	(i, ii)
CH	..	..	..	..	3 819	..	..	..	..	(ii)
Central European Free Trade Association (CEFTA)										
	6 512	5 055	6 138	4 583	3 699	3 226	3 068	2 950	2 800	
CZ ijk	..	..	2 053	1 708	1 381	1 010	958	926	..	(iv, v, ii)
SK ijk	..	..	674	741	507	398	277	304	..	(iv)
CS l	2 091	2 222	..	..	..	..	..	..	..	(iii)
HU kl	1 528	1 359	948	561	535	494	463	395	..	(ii, iii)
PL ikm	2 893	1 474	2 464	1 573	1 275	1 324	1 370	1 324	..	(iv, v, ii)
Other European Countries										
	..	..	24 607	17 299	9 752	8 767	8 037	7 120	6 600	
BG	533	899	927	525	524	372	282	237	..	(iv)
RO	..	1 131	1 228	721	580	652	569	589	..	(iv, v)
RU	..	11 965	17 999	12 040	5 325	5 045	4 839	4 039	..	(iv, v)
UA	..	..	3 598	2 607	1 941	1 349	1 307	1 045	..	(iv, v)
SU gn	61 392	75 858	..	..	..	..	..	..	..	(iii)
TR e	..	1 103	856	1 406	1 381	1 349	1 042	1 210	..	(ii, iii)
North American Free Trade Association (NAFTA)										
	..	137 013	151 400	151 900	151 900	149 935	150 409	151 722	153 400	
CA	4 400	6 434	7 504	7 635	7 910	8 408	8 727	8 825	8 834	(ii)
MX	..	1 584	..	..	..	1 085	1 521	1 741	..	(ii, iii)
US f	93 893	128 995	143 025	143 306	142 967	140 442	140 160	141 155	142 488	(ii)
South American Countries										
	1 945	1 900	2 600	2 600	3 100	3 126	2 678	2 800	2 700	
AR	701	..	..	..	567	727	688	780	..	(iii, iv)
BR op	724	852	..	..	..	1 140	959	..	..	(iii, iv)
CL o	197	204	331	370	470	526	567	549	..	(iii, iii)
VE oq	323	328	581	608	709	733	464	702	..	(iii, iv)
Developed Asian Economies										
	29 369	46 583	68 018	70 694	71 513	71 593	73 422	78 891	84 100	
JP r	27 645	41 988	58 187	59 640	59 020	57 435	56 777	60 295	..	(ii)
KR	1 048	3 173	6 368	7 184	8 124	9 575	11 645	13 212	..	(iv)
SG e	51	170	325	416	516	515	581	659	..	(iv)
TW	625	1 253	3 138	3 453	3 854	4 068	4 419	4 725	..	(iv)

Table A.2.1: Gross Domestic Expenditure on R&D (GERD) (continued)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										

ID <i>qs</i>	730	..	..	..	..	..	815	793	..	(iii, iv)
MY	..	..	..	..	431	..	451	..	..	(iii, iv)
PH	274	..	186	190	263	..	..	..	..	(iii, iv)
TH	402	447	..	378	..	397	..	415	..	(iii)
China and Hong Kong										
	..	..	..	..	..	..	..	12 098	..	..
CN	..	..	9 449	9 961	10 999	11 356	10 306	11 746	..	(iii, iv)
HK <i>t</i>	..	..	..	..	..	..	..	352	..	(iii)
Other Asian Countries										
	..	8 089	..	..	..	..	..	..	..	..
PK <i>euu</i>	..	1 158	..	..	..	..	..	..	..	(iii)
IN <i>v</i>	3 784	6 930	8 863	8 784	9 131	9 940	10 049	..	..	(iv)
Oceania										
	..	..	3 895	4 200	4 609	4 900	5 100	5 200	..	..
AU	..	..	3 479	..	4 180	..	4 588	..	..	(ii)
NZ	..	..	417	405	428	463	..	..	..	(ii)
Other Countries										
	..	2 313	2 200	2 336	2 300	2 196	2 200	..	..	..
IL <i>o</i>	..	1 163	1 028	1 066	1 181	1 252	..	..	..	(iii, iv)
ZA	..	1 151	..	1 270	..	943	..	..	..	(iii)
Mediterranean Countries										

CY	3	..	..	12	13	..	..	..	..	(iii, iv)
EG <i>o</i>	..	..	973	..	..	548	581	575	..	(ii)
IL <i>o</i>	..	1 163	1 028	1 066	1 181	1 252	..	..	..	(iii, iv)
TR <i>e</i>	..	1 103	856	1 406	1 381	1 349	1 042	1 210	..	(ii, iii)

Notes

- a* Excluding Luxembourg
b No data available for public enterprises
c The delimitation of the government sector does not agree entirely with the international methodological recommendations
d Break in series between 1990 and 1991 because of unification
e Not including social sciences and humanities (UK before 1994, TR only government sector, PK government and higher education sectors)
f Current expenditure only
g Data are in million 1989 PPS
h Data before 1991 include extramuros R&D expenditure
i Until 1995, defence R&D is not included (Poland only partly covered)
j Data cover all activities of R&D units and refer to S&T rather than R&D (Slovakia until 1994)
k Including depreciation costs (Slovakia, Hungary and Poland until 1994)
l Of military R&D, only that part carried out in civil establishments is included
m Until 1994, excluding capital expenditures in industrial enterprises and in the higher education sector
n Value of R&D (including profit) performed within R&D institutions
o Not including military and defence R&D (Brazil only 1985, Venezuela until 1986)
p For 1985, not including private productive enterprises
q Government funds only
r Series adjusted by the OECD Secretariat
s Not including the productive sector
t Not including the government sector
u Data refer to R&D activities concentrated mainly in government-financed research establishments only
v Not including the higher education sector

Source: (i) Eurostat (iv) national source
(ii) OECD (v) estimations by CSRS, Moscow according to the OECD Frascati standards
(iii) UNESCO

Table A.2.2: Business Enterprise Sector Expenditure on R&D (BERD)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU) a										
	41 400	53 200	65 700	65 200	64 600	63 300	63 200	64 000	65 000	
B b	1 261	1 558	..	1 703	..	1 583	1 677	1 760	..	(i)
DK	337	506	728	795	812	848	..	954	..	(i, ii)
D c	..	18 563	21 333	22 105	21 202	20 010	19 562	19 499	19 569	(i, ii)
DD de	..	2 739	..	..	..	..	..	..	..	(iv)
EL	..	..	..	86	..	115	..	..	..	(i, ii)
E	671	1 040	2 092	2 129	2 024	1 894	1 753	1 671	1 628	(i)
F	8 068	10 424	13 337	13 633	14 076	13 926	13 862	13 893	14 120	(i, ii)
IRL	..	125	191	233	275	337	411	486	..	(i, ii)
I f	3 052	4 764	6 493	5 992	5 823	5 258	4 950	5 076	5 143	(i, ii)
L	..	..	..	..	..	..	..	..	..
NL	1 713	2 197	2 521	2 307	2 231	2 304	2 526	2 680	..	(i, ii)
A	..	703	..	..	..	1 052	..	..	..	(i)
P	53	..	122	..	126	..	..	110	..	(i, ii)
FIN	..	589	894	821	829	856	1 008	1 079	..	(i, ii)
S	..	2 366	..	2 637	..	2 974	..	3 683	..	(i)
UK d	..	10 204	12 661	11 615	11 588	12 014	11 974	11 916	..	(i)
European Free Trade Association (EFTA)										
	2 400	3 300	3 700	3 500	3 400	3 400	..	..	..
IS	..	4	8	11	13	18	20	21	22	(ii)
NO	346	643	..	690	..	753	..	..	..	(i, ii)
CH	..	..	..	..	2 676	..	..	..	..	(ii)
Central European Free Trade Association (CEFTA)										
	..	..	3 800	2 800	2 286	1 753	1 516	1 456	1 300	
CZ ghi	..	..	..	1 186	1 036	739	642	603	..	(ii)
SK ghi	..	..	..	..	349	286	146	164	..	(iv)
CS	..	..	..	..	..	..	..	..	..
HU ijk	912	822	361	232	195	161	163	172	..	(iv, ii)
PL egi	1 926	913	1 615	988	705	568	565	518	..	(iv, ii)
Other European Countries										
	..	..	17 600	11 992	6 268	5 330	4 823	4 268	3 600	
BG	315	568	569	284	266	186	140	117	..	(iv)
RO e	..	..	..	487	429	475	429	441	..	(iv, v)
RU	..	..	13 887	9 206	4 126	3 564	3 194	2 767	..	(iv, v)
UA	..	..	2 147	1 720	1 114	796	803	658	..	(iv, v)
SU	..	..	..	..	..	..	..	..	..
TR	..	819	174	297	332	309	257	286	..	(ii, iii)
North American Free Trade Association (NAFTA)										
	67 300	97 300	106 000	108 817	107 636	104 537	104 975	107 029	109 300	
CA	1 959	3 389	4 034	4 070	4 319	4 788	5 098	5 292	5 462	(ii)
MX	..	..	..	422	52	112	384	318	..	(ii)
US el	65 100	93 636	101 599	104 325	103 265	99 637	99 493	101 418	103 549	(ii)
South American Countries										
	..	..	..	..	800	600	541	700	800	
AR	371	..	..	..	204	83	74	280	..	(iii, iv)
BR	..	..	..	..	..	..	174	..	..	(iii)
CL m	115	..	47	59	79	88	100	..	..	(iii, iv)
VE n	..	..	192	221	239	254	193	189	..	(iv)
Developed Asian Economies										
	18 721	32 784	50 462	52 180	51 644	50 304	51 758	55 215	59 400	
JP o	18 051	30 141	43 920	44 962	43 402	40 826	40 380	42 410	..	(ii)
KR	302	1 926	4 514	5 123	5 904	6 844	8 474	9 660	..	(iv)
SG d	27	90	176	243	314	319	364	425	..	(iv)
TW	341	627	1 853	1 851	2 025	2 315	2 540	2 720	..	(iv)

Table A.2.2: Business Enterprise Sector Expenditure on R&D (BERD)

Million 1990 PPS (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										
	
ID	292	..	(iii)
MY	193	..	216	..	..	(iv)
PH	54	..	..	..	57	..	..	..	..	(iii)
TH	30	..	(iii)
China and Hong Kong										
	3 784	..	
CN	2 581	3 673	..	3 741	..	(iii)
HK	43	..	(iii)
Other Asian Countries										
	
PK	
IN	1 030	1 509	2 151	2 183	2 413	2 572	2 659	..	..	(iv)
Oceania										
	1 516	1 660	1 964	2 102	2 300	2 400	..	
AU	..	865	1 399	1 544	1 845	1 962	2 120	..	..	(ii)
NZ	118	109	116	139	..	..	..	(ii)
Other Countries										
	1 000	1 094	1 100	1 076	1 100	..	..
IL <i>m</i>	..	586	474	502	558	579	..	..	..	(iii, iv)
ZA	591	..	497	..	..	..	(iii)
Mediterranean Countries										
	
CY	2	2	..	..	..	..	(iii, iv)
IL <i>m</i>	..	586	474	502	558	579	..	..	..	(iii, iv)
TR	..	819	174	297	332	309	257	286	..	(ii, iii)

Notes

- a Excluding Luxembourg
b No data available for public enterprises
c Break in series between 1990 and 1991 because of unification
d Not including social sciences and humanities (UK before 1994)
e Current expenditure only (Poland and Romania until 1994)
f Data before 1991 include extramuros R&D expenditure
g Until 1995, defence R&D is not included (Poland only partly covered)
h Data cover all activities of R&D units and refer to S&T rather than R&D (Slovakia until 1994)
i Including depreciation costs (Slovakia, Hungary and Poland until 1994)
j Of military R&D, only that part carried out in civil establishments is included
k Breakdowns (business enterprise -, government - and higher education sectors) do not add to total gross expenditure on R&D
l Depreciation is shown instead of gross capital expenditure
m Not including military and defence R&D
n Government funds only
o Data overestimated by about 15%

Source: (i) Eurostat (iv) national source
(ii) OECD (v) estimations by CSRS, Moscow according to the OECD Frascati standards
(iii) UNESCO

Table A.2.3: Business Enterprise Sector Expenditure on R&D by Region (BERDR)

Million 1990 PPS

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
BELGIUM a	1 558	1 597	1 648	1 700	1 663	..	1 703	..	1 583	1 677	1 760
Vlaams Gewest	..	..	..	..	958	..	1 002	..	..	1 132	1 174
Région Wallonne	..	..	..	..	337	..	342	..	..	384	410
Bruxelles-Brussel	..	..	..	..	321	..	307	..	..	162	176
Not registered by region	..	..	..	..	47	..	52	..	..	-	-
DENMARK b	506	557	601	636	661	728	795	812	848	..	954
København Og Frederiksborg Kommuner	..	..	..	..	..	..	..	..	..	..	..
Københavns Amt	..	..	..	..	..	..	..	..	..	..	..
Frederiksborg Amt	..	..	..	..	..	..	..	..	..	..	..
Roskilde Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	325	..	396	..	438	..	514	..	563	..	..
Vestsjællands Amt	..	..	..	..	..	..	..	..	..	..	..
Storstrøms Amt	..	..	..	..	..	..	..	..	..	..	..
Bornholms Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	11	..	9	..	11	..	18	..	14	..	..
Fyns Amt	15	..	26	..	27	..	24	..	19	..	..
Sønderjyllands Amt	..	..	..	..	..	..	..	..	..	..	..
Ribe Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	22	..	41	..	49	..	79	..	87	..	..
Vejle Amt	..	..	..	..	..	..	..	..	..	..	..
Ringkøbing Amt	..	..	..	..	..	..	..	..	..	..	..
Viborg Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	39	..	59	..	59	..	66	..	69	..	..
Århus Amt	35	..	51	..	57	..	56	..	74	..	..
Nordjyllands Amt	18	..	20	..	19	..	38	..	22	..	..
Not registered by region	40	..	-	..	-	..	-	..	-	..	..
GERMANY c	18 563	18 676	19 417	20 368	21 138	21 333	22 105	21 202	20 010	19 562	19 499
Baden-Württemberg	4 115	..	4 414	..	4 936	..	5 104	..	5 277	..	..
Bayern	4 446	..	4 961	..	5 635	..	5 795	..	4 701	..	..
Bayern	430	..	536	..	659	..	691	..	782	..	..
Brandenburg	..	..	..	..	..	..	86	..	120	..	..
Bremen	397	..	226	..	315	..	330	..	246	..	..
Hamburg	574	..	663	..	388	..	376	..	418	..	..
Hessen	2 155	..	2 125	..	2 295	..	2 312	..	2 111	..	..
Mecklenburg-Vorpommern	..	..	..	..	..	..	36	..	27	..	..
Niedersachsen	1 067	..	1 209	..	1 247	..	1 181	..	1 052	..	..
Nordrhein-Westfalen	4 014	..	3 890	..	4 134	..	4 168	..	3 447	..	..
Rheinland-Pfalz	906	..	988	..	1 166	..	968	..	802	..	..
Saarland	49	..	34	..	46	..	40	..	41	..	..
Sachsen	..	..	..	..	..	..	309	..	307	..	..
Sachsen-Anhalt	..	..	..	..	..	..	163	..	128	..	..
Schleswig-Holstein	232	..	226	..	294	..	269	..	225	..	..
Thüringen	..	..	..	..	..	..	130	..	124	..	..
Not registered by region	179	..	146	..	23	..	147	..	201	..	..
GREECE	..	56	..	71	73	..	87	..	116	..	..
Voreia Ellada	..	6	..	12	11	..	9	..	25	..	..
Anatoliki Makedonia, Thraki	..	1	..	1	1	..	1	..	3	..	..
Kentriki Makedonia	..	5	..	9	8	..	7	..	19	..	..
Dytiki Makedonia	..	-	..	0	0	..	1	..	0	..	..
Thessalia	..	1	..	2	2	..	1	..	3	..	..
Kentriki Ellada	..	12	..	11	11	..	14	..	14	..	..
Ipeiros	..	-	..	-	0	..	1	..	1	..	..
Ionia Nisia	..	-	..	-	-	..	-	..	1	..	..
Dytiki Ellada	..	5	..	5	5	..	1	..	0	..	..
Stereia Ellada	..	7	..	5	5	..	12	..	9	..	..
Peloponnisos	..	0	..	1	0	..	1	..	3	..	..
Attiki	..	36	..	44	49	..	61	..	74	..	..
Nisia Aigaiou, Kriti	..	0	..	4	2	..	1	..	2	..	..
Voreio Aigaio	..	-	..	-	-	..	0	..	0	..	..
Notio Aigaio	..	0	..	4	2	..	1	..	0	..	..
Kriti	..	0	..	0	0	..	0	..	2	..	..
SPAIN	1 040	1 205	1 306	1 595	1 743	2 092	2 129	2 024	1 894	1 753	1 671
Noroeste	..	41	41	47	53	58	58	68	57	53	..
Galicia	..	15	17	19	17	24	23	36	32	29	..
Asturias	..	23	20	19	29	24	27	25	17	16	..
Cantabria	..	3	4	9	7	10	8	7	9	8	..
Noreste	..	177	208	251	290	333	360	316	315	291	..
Pais Vasco	..	143	163	201	225	258	285	246	239	222	..
Navarra	..	13	18	21	27	33	32	30	33	30	..
Rioja	..	2	1	2	4	3	5	5	6	5	..
Aragón	..	19	26	26	34	39	38	36	37	34	..

Table A.2.3: Business Enterprise Sector Expenditure on R&D by Region (BERDR)

Million 1990 PPS

(continued)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Madrid	..	534	584	659	760	961	933	858	769	712	..
Centro (E)	..	86	41	91	81	93	90	97	100	93	..
Castilla-León	..	73	27	71	65	77	71	73	81	75	..
Castilla-La Mancha	..	10	10	15	14	13	16	21	18	16	..
Extremadura	..	4	4	4	2	2	3	3	2	2	..
Este	..	294	364	456	462	545	588	585	557	515	..
Cataluña	..	273	324	396	396	492	528	518	488	452	..
Comunidad Valenciana	..	19	34	59	65	53	60	66	67	62	..
Balears	..	2	7	2	1	1	1	1	1	1	..
Sur	..	72	68	91	95	100	97	99	94	87	..
Andalucía	..	67	61	80	85	90	88	83	81	75	..
Murcia	..	5	8	12	10	10	9	16	13	12	..
Ceuta Y Melilla	..	-	-	-	-	-	-	-	-	-	..
Canarias	..	1	0	0	1	2	3	1	2	1	..
FRANCE	10 424	10 577	11 044	11 644	12 555	13 337	13 633	14 076	13 926	13 862	13 893
Île de France	6 983	7 331	7 433	7 493	7 328	7 242	..
Bassin Parisien	982	1 103	1 156	1 270	1 259	1 267	..
Champagne-Ardenne	49	60	62	73	71	76	..
Picardie	218	225	223	231	236	214	..
Haute-Normandie	300	313	317	307	311	318	..
Centre	209	277	321	380	360	390	..
Basse-Normandie	59	71	69	90	93	87	..
Bourgogne	148	157	163	189	188	183	..
Nord-Pas-de-Calais	159	170	191	184	206	200	..
Est	494	548	621	679	710	658	..
Lorraine	137	162	156	156	154	168	..
Alsace	134	139	161	200	204	196	..
Franche-Comté	222	248	304	324	352	294	..
Ouest	484	506	562	704	769	819	..
Pays de la Loire	208	218	234	236	251	277	..
Bretagne	197	211	239	386	433	445	..
Poitou-Charentes	79	78	89	82	85	96	..
Sud-Ouest	1 129	1 271	1 283	1 290	1 135	1 134	..
Aquitaine	502	533	519	491	448	459	..
Midi-Pyrénées	590	703	730	757	648	636	..
Limousin	37	35	33	42	39	39	..
Centre-Est	1 435	1 468	1 462	1 528	1 592	1 644	..
Rhône-Alpes	1 135	1 198	1 230	1 298	1 380	1 446	..
Auvergne	300	270	232	230	211	198	..
Méditerranée	891	940	926	928	928	898	..
Languedoc-Roussillon	116	109	116	115	132	122	..
Provence-Alpes-Côte d'Azur	774	831	810	814	796	776	..
Corse d
Départements d'Outre-Mer e
IRELAND	125	140	144	147	165	191	233	275	337	411	486
East	..	47	..	55	..	79	91	..	125	..	196
South West (IRL)	..	22	..	22	..	19	32	..	53	..	65
South East (IRL)	..	18	..	14	..	13	10	..	19	..	32
North East	..	5	..	6	..	7	8	..	11	..	22
Mid West	..	24	..	28	..	28	41	..	45	..	82
Donegal	..	1	..	1	..	3	2	..	4	..	..
Midlands	..	11	..	11	..	28	29	..	49	..	39
West	..	12	..	9	..	12	15	..	28	..	33
North West (IRL)	..	1	..	2	..	3	3	..	2	..	17
ITALY f	4 764	5 050	5 349	5 754	6 132	6 493	5 992	5 823	5 258	4 950	5 076
Nord Ovest	2 101	1 908	1 634	1 383	..
Piemonte	1 898	1 716	1 455	1 226	..
Valle d'Aosta	3	3	1	2	..
Liguria	201	190	178	156	..
Lombardia	1 897	1 913	1 752	1 671	..
Nord Est	330	290	260	361	..
Trentino-Alto Adige	29	14	11	26	..
Veneto	213	185	168	211	..
Friuli-Venezia Giulia	87	91	82	125	..
Emilia-Romagna	343	316	273	319	..
Centro (I)	281	289	249	244	..
Toscana	232	245	218	200	..
Umbria	19	19	13	17	..
Marche	31	25	18	27	..
Lazio	632	639	588	541	..
Campania	171	200	247	196	..
Abruzzo-Molise	77	98	92	87	..
Abruzzo	73	97	91	86	..
Molise	4	1	1	1	..
Sud	92	94	99	84	..

Table A.2.3: Business Enterprise Sector Expenditure on R&D by Region (BERDR)

Million 1990 PPS

(continued)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Puglia	74	76	81	70	..
Basilicata	8	9	11	9	..
Calabria	10	9	7	6	..
Sicilia	47	55	41	44	..
Sardegna	20	21	21	19	..
LUXEMBOURG
NETHERLANDS	2 197	2 492	2 674	2 711	2 675	2 521	2 307	2 231	2 304	2 526	2 680
AUSTRIA	703	..	..	..	920	..	..	..	1 053	..	..
Ostösterreich	476	..	..	..	599	..	..
Burgenland	3	..	..	..	7	..	..
Niederösterreich	86	..	..	..	74	..	..
Wien	388	..	..	..	518	..	..
Südösterreich	163	..	..	..	145	..	..
Kärnten	18	..	..	..	14	..	..
Steiermark	145	..	..	..	131	..	..
Westösterreich	280	..	..	..	280	..	..
Oberösterreich	167	..	..	..	155	..	..
Salzburg	20	..	..	..	23	..	..
Tirol	62	..	..	..	66	..	..
Vorarlberg	31	..	..	..	36	..	..
PORTUGAL	..	73	..	83	..	123	..	127	..	..	111
Continente	122	..	126	..	..	109
Norte	32	..	32	..	..	25
Centro (P)	23	..	21	..	..	25
Lisboa E Vale Do Tejo	64	..	64	..	..	56
Alentejo	2	..	9	..	..	3
Algarve	-	..	-	0
Açores	-	..	-	0
Madeira	0	..	-	..	..	0
FINLAND	589	641	698	764	845	894	821	829	856	1 008	1 079
SWEDEN	2 366	..	2 535	..	2 562	..	2 637	..	2 974	..	3 683
UNITED KINGDOM <i>g</i>	10 204	11 495	11 659	12 013	12 387	12 661	11 615	11 588	12 014	11 974	11 916
North	175	364	346
Yorkshire and Humberside	305	333	354
East Midlands	1 047	774	781
East Anglia	340	606	658
South East (UK)	6 753	5 891	5 955
South West (UK)	733	1 000	987
West Midlands	955	795	842
North West (UK)	1 182	1 573	1 370
Wales	148	150	122
Scotland	325	414	422
Northern Ireland	52	75	78
NORWAY <i>h</i>	643	..	751	..	696	..	690	..	754	..	..
Oslo	293	..	..
Ostlandet Sudre	109	..	..
Ostlandet Nordre	30	..	..
Ager og Rogaland	54	..	..
Vestlandet	88	..	..
Trondelag	170	..	..
Nord-Norge	8	..	..

Notes*a* No data available for public enterprise*b* Some regions are combined with those of neighbouring regions for statistical secrecy reasons*c* Break in series between 1990 and 1991 because of unification*d* Statistical secret*e* Overseas departments not surveyed*f* Data before 1991 include extramuros R&D expenditure*g* Before 1994 not including social sciences and humanities*h* The regional breakdown is based on a national classification and not on the NUTS**Source: Eurostat**

Table A.2.4: Government Sector Expenditure on R&D (GOVERD)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU) a										
	12 500	15 000	16 800	17 400	16 900	17 000	16 700	16 800	16 700	
B	105	119	..	157	..	155	97	98	..	(i)
DK b	150	179	234	241	247	259	..	..	..	(i, ii)
D cd	..	3 389	3 944	4 439	4 423	4 549	4 434	4 415	..	(i)
DD	..	..	..	..	..	..	..	..	..
EL	..	103	..	132	..	137	..	120	..	(i, ii)
E	403	455	769	809	802	793	776	779	759	(i)
F	3 094	4 486	5 338	5 023	4 711	4 768	4 624	4 703	..	(i, ii)
IRL	..	67	47	42	48	56	64	67	..	(i, ii)
I e	1 283	1 998	2 332	2 442	2 293	2 095	1 987	2 018	1 987	(i, ii)
L	..	..	..	..	..	..	..	..	..
NL	708	716	813	849	841	845	915	..	..	(i, ii)
A	..	108	..	..	..	167	..	..	..	(i)
P	87	..	119	..	129	..	..	148	..	(i, ii)
FIN d	..	199	268	291	301	310	306	294	..	(i, ii)
S	..	153	..	156	..	178	..	184	..	(i)
UK f	3 085	2 903	2 384	2 509	2 520	2 554	2 668	2 638	..	(i)
European Free Trade Association (EFTA)										
	300	400	400	407	400	400	400	..	..
IS	..	13	22	23	25	24	26	27	29	(ii)
NO d	130	155	..	238	..	270	..	..	..	(i, ii)
CH g	..	..	137	146	143	..	109	..	..	(ii)
Central European Free Trade Association (CEFTA)										
	..	..	1 400	1 300	906	950	997	936	900	
CZ hij	..	..	..	495	331	238	273	245	..	(ii)
SK hij	..	..	..	..	136	102	117	122	..	(iv)
CS	..	..	..	..	..	..	..	..	..
HU jkl	268	218	185	137	135	127	126	101	..	(ii, iv)
PL hj	269	239	449	358	304	483	481	467	..	(ii, iv)
Other European Countries										
	..	..	4 600	3 177	1 978	2 009	2 041	1 684	1 800	
BG	187	272	311	194	215	155	118	100	..	(iv)
RO m	..	..	..	125	105	120	84	131	..	(iv, v)
RU	..	..	2 884	2 056	893	1 201	1 359	1 053	..	(iv, v)
UA	..	..	1 119	691	652	399	389	310	..	(iv, v)
SU	..	..	..	..	..	..	..	..	..
TR f	..	157	84	111	113	134	90	89	..	(ii, iii)
North American Free Trade Association (NAFTA)										
	..	17 400	17 200	16 297	16 112	16 356	15 620	15 424	14 800	
CA	1 088	1 463	1 505	1 493	1 468	1 463	1 445	1 398	1 294	(ii)
MX g	..	..	..	716	695	385	421	648	..	(ii)
US g	11 883	15 090	15 008	14 088	13 949	14 508	13 753	13 377	12 782	(ii)
South American Countries										
	..	..	..	..	1 400	1 600	1 250	1 200	1 000	
AR	224	..	..	..	193	418	344	219	..	(iii, iv)
BR n	..	148	..	..	..	..	474	..	..	(iii)
CL n	10	..	143	164	204	217	234	..	..	(iii, iv)
VE o	..	..	323	312	378	391	197	355	..	(iv)
Developed Asian Economies										
	4 292	5 241	6 438	6 800	7 560	8 420	8 446	9 429	9 800	
JP	3 552	4 114	4 630	4 832	5 266	5 766	5 515	6 275	..	(ii)
KR	650	942	1 390	1 562	1 727	2 039	2 272	2 472	..	(iv)
SG f	7	28	81	92	117	114	128	141	..	(iv)
TW	83	157	337	314	450	500	530	541	..	(iv)

Table A.2.4: Government Sector Expenditure on R&D (GOVERD)

Million 1990 PPS (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										
	
ID <i>o</i>	..	709	500	559	..	..	..	501	..	(iii, iv)
MY	198	..	122	..	..	(iv)
PH	199	..	..	..	..	..	..	132	..	(iii)
TH	236	..	(iii)
China and Hong Kong										
	
CN	7 484	5 672	..	6 394	..	(iii)
HK	
Other Asian Countries										
	
PK	
IN	2 754	5 421	6 712	6 601	6 719	..	7 279	..	..	(iv)
Oceania										
	..	1 200	1 318	1 300	1 356	1 400	1 400	1 400	..	
AU	..	954	1 135	..	1 175	..	1 231	..	..	(ii)
NZ	183	181	180	193	..	..	..	(ii)
Other Countries										
	500	496	500	441	400	..	..
IL <i>dn</i>	..	169	127	132	144	146	..	..	..	(iii, iv)
ZA	364	..	295	..	..	..	(iii)
Mediterranean Countries										
	
CY	10	11	..	..	..	..	(iii, iv)
IL <i>dn</i>	..	169	127	132	144	146	..	..	..	(iii, iv)
TR <i>f</i>	..	157	84	111	113	134	90	89	..	(ii, iii)

Notes

- a* Excluding Luxembourg
b The delimitation of the government sector does not agree entirely with the international methodological recommendations
c Break in series between 1990 and 1991 because of unification
d Including PNP sector (Finland since 1994)
e Data before 1991 include extramuros R&D expenditure
f Not including social sciences and humanities (UK before 1994)
g Federal or central government only (Mexico only 1991 and 1992)
h Until 1995, defence R&D is not included (Poland only partly covered)
i Data cover all activities of R&D units and refer to S&T rather than R&D (Slovakia until 1994)
j Including depreciation costs (Slovakia, Hungary and Poland until 1994)
k Breakdowns (business enterprise -, government - and higher education sectors) do not add to total gross expenditure on R&D
l Of military R&D, only that part carried out in civil establishments is included
m Until 1994, current expenditure only
n Not including military and defence R&D (Brazil only 1985)
o Government funds only

Source: (i) Eurostat (iv) national source
(ii) OECD (v) estimations by CSRS, Moscow according to the OECD Frascati standards
(iii) UNESCO

Table A.2.5: Higher Education Sector Expenditure on R&D (HERD)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU) a										
	10 700	14 000	18 100	19 300	20 000	20 900	21 000	21 000	21 300	
B	370	408	..	671	..	712	702	711	..	(i)
DK	179	223	302	306	316	332	..	..	..	(i, ii)
D b	..	3 737	4 377	5 205	5 338	5 404	5 553	5 574	5 624	(i)
DD	..	..	..	..	..	..	..	..	..
EL	..	..	..	111	..	174	..	208	..	(i, ii)
E	285	388	737	845	1 158	1 241	1 184	1 151	1 121	(i)
F	2 059	2 670	3 217	3 345	3 441	3 572	3 627	3 645	..	(i, ii)
IRL	..	48	75	85	95	105	117	132	..	(i, ii)
I	834	1 604	2 309	2 303	2 319	2 767	2 412	2 362	2 303	(i, ii)
L	..	..	..	..	..	..	..	..	..
NL	808	908	1 335	1 380	1 382	1 402	1 416	..	..	(i, ii)
A	..	448	..	..	..	658	..	..	..	(i)
P	37	..	168	..	250	..	..	186	..	(i, ii)
FIN	..	209	267	318	321	300	305	334	..	(i, ii)
S	..	952	..	1 054	..	927	..	870	..	(i)
UK c	..	2 331	2 851	2 884	2 906	3 063	3 412	3 424	..	(i)
European Free Trade Association (EFTA)										
	800	700	1 100	1 300	1 300	1 300	1 300	1 300	..	
IS	..	8	11	15	18	14	15	16	17	(ii)
NO	205	228	..	337	..	384	..	390	..	(i, ii)
CH	..	..	..	..	954	..	941	..	..	(ii)
Central European Free Trade Association (CEFTA)										
	..	..	600	400	416	427	503	533	600	
CZ def	..	..	..	28	14	32	43	79	..	(ii)
SK def	..	..	..	..	21	11	14	18	..	(iv)
CS	..	..	..	..	..	..	..	..	..
HU fgh	152	156	137	114	114	112	122	98	..	(ii, iii)
PL dfi	643	314	400	226	267	273	324	339	..	(iv, ii)
Other European Countries										
	..	..	2 200	2 040	1 475	1 387	1 129	1 168	1 200	
BG	32	59	46	47	43	30	23	20	..	(iv)
RO i	..	..	..	21	16	16	11	17	..	(iii, iv, v)
RU	..	..	1 228	778	306	281	286	219	..	(iv, v)
UA	..	..	332	196	175	154	114	78	..	(iv, v)
SU	..	..	..	..	..	..	..	..	..
TR	..	127	597	999	936	906	694	835	..	(ii, iii)
North American Free Trade Association (NAFTA)										
	..	18 400	24 400	22 700	23 400	24 062	24 709	24 234	24 200	
CA	1 315	1 530	1 887	1 990	2 032	2 062	2 076	2 018	1 951	(ii)
MX	..	..	..	..	..	583	710	703	..	(ii)
US ij	13 765	16 461	22 066	20 211	20 855	21 417	21 923	21 513	21 451	(ii)
South American Countries										
	..	..	..	..	900	900	882	900	900	
AR	105	..	..	..	170	209	266	281	..	(iii, iv)
BR kl	..	134	..	..	..	..	311	..	..	(iii)
CL k	72	..	139	150	186	221	231	..	..	(iii, iv)
VE m	..	..	68	76	95	88	74	158	..	(iv)
Developed Asian Economies										
	5 449	6 525	8 039	8 314	8 706	9 416	9 673	10 556	10 800	
JP n	5 206	5 958	7 091	7 200	7 572	8 056	8 019	8 722	..	(ii)
KR	96	305	464	499	493	692	898	1 079	..	(iv)
SG	13	51	68	81	85	81	89	93	..	(iv)
TW	135	211	416	534	556	587	667	661	..	(iv)

Table A.2.5: Higher Education Sector Expenditure on R&D (HERD)

Million 1990 PPS (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										

ID <i>m</i>
MY	40	..	111	..	..	(iii, iv)
PH	21	..	..	..	167	..	..	..	..	(iii)
TH	..	31	..	76	..	..	159	..	..	(iii)
China and Hong Kong										
	1 919	..	..
CN	283	201	..	1 610	..	(iii)
HK	309	..	(iii)
Other Asian Countries										

PK
IN	111	..	..	(iii)
Oceania										
	1 004	1 100	1 227	1 300	1 300	1 300	..	..
AU	888	..	1 095	..	1 147	..	..	(ii)
NZ	116	116	132	131	..	..	..	(ii)
Other Countries										
	600	661	600	584	600	..	..	..
IL <i>k</i>	..	408	342	346	393	433	..	..	..	(iii, iv)
ZA	315	..	151	..	..	..	(iii)
Mediterranean Countries										

CY
IL <i>k</i>	..	408	342	346	393	433	..	..	..	(iii, iv)
TR	..	127	597	999	936	906	694	835	..	(ii, iii)

Notes*a* Excluding Luxembourg*b* Break in series between 1990 and 1991 because of unification*c* Not including social sciences and humanities (UK before 1994)*d* Until 1995, defence R&D is not included (Poland only partly covered)*e* Data cover all activities of R&D units and refer to S&T rather than R&D (Slovakia until 1994)*f* Including depreciation costs (Slovakia, Hungary and Poland until 1994)*g* Of military R&D, only that part carried out in civil establishments is included*h* Breakdowns (business enterprise -, government - and higher education sectors) do not add to total gross expenditure on R&D*i* Current expenditure only (Romania until 1994, US from 1991)*j* Excluding humanities*k* Not including military and defence R&D (Brazil only 1985)*l* For 1985, not including private productive enterprises*m* Government funds only*n* Series adjusted by the OECD Secretariat

Source: (i) Eurostat (iv) national source
(ii) OECD (v) estimations by CSRS, Moscow according to the OECD Frascati standards
(iii) UNESCO

Table A.2.6: R&D Expenditure Financed by the Business Enterprise Sector

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU) ^a										
	31 500	42 500	53 000	53 600	54 700	54 200	53 900	54 400	54 900	
B	1 181	1 450	..	1 660	..	1 555	..	..	..	(i)
DK	291	448	630	698	704	728	..	..	..	(ii)
D	..	15 699	18 808	19 680	19 081	18 393	17 996	17 939	17 982	(i)
DD	..	..	..	..	..	..	..	..	..
EL	..	..	..	71	..	87	..	..	..	(ii)
E	638	889	1 715	1 829	1 750	1 627	1 510	..	..	(i)
F	5 835	7 357	9 599	9 430	10 495	10 619	10 912	..	..	(ii)
IRL	..	111	188	222	272	309	405	465	..	(i,ii)
I	2 696	3 733	4 871	5 483	5 881	5 230	4 908	5 034	5 088	(ii)
L	..	..	..	..	..	..	..	..	..
NL	1 499	2 023	2 292	2 222	2 148	2 059	2 199	..	..	(i,ii)
A	..	631	879	925	911	922	946	977	1 004	(i,ii)
P	49	..	126	..	117	..	..	104	..	(ii)
FIN	..	..	..	811	..	830	..	985	..	(i,ii)
S	..	2 118	..	2 382	..	2 649	..	..	..	(ii)
UK	..	7 276	9 053	8 594	8 771	9 189	9 105	8 737	..	(i,ii)
European Free Trade Association (EFTA)										
	2 300	3 200	3 500	3 300	3 200	3 100	..	..	..
IS	..	6	10	13	14	18	20	21	23	(ii)
NO	242	530	..	563	..	623	..	..	..	(ii)
CH	..	..	..	..	2 575	..	..	..	..	(ii)
Central European Free Trade Association (CEFTA)										
	..	..	..	..	2 100	1 700	1 481	1 324	..	
CZ	..	..	..	..	1 081	..	691	585	..	(iii, ii)
SK	..	..	..	..	..	..	166	148	..	(v)
CS ^d	1 244	1 321	..	..	..	..	..	..	..	(iii)
HU	1 160	1 069	664	314	281	262	176	170	..	(iii, ii)
PL	..	..	..	..	..	..	449	421	..	(ii)
Other European Countries										
	..	..	..	..	..	..	..	2 602	..	
BG	334	577	..	..	353	..	..	146	..	(iii, iv, v)
RO	..	..	..	..	321	170	165	194	..	(iii, iv, v)
RU	..	..	..	..	..	..	..	1 355	..	(iv, v)
UA	..	..	..	..	..	..	..	534	..	(iv, v)
TR	..	..	235	401	467	429	344	373	..	(ii)
North American Free Trade Association (NAFTA)										
	..	67 000	80 400	85 700	87 000	85 992	86 000	89 059	92 900	
CA	1 735	2 575	3 112	3 156	..	3 766	..	4 114	4 239	(ii)
MX	..	..	..	..	..	155	289	390	..	(ii)
US	45 016	64 446	77 204	82 499	83 592	82 070	82 660	84 555	87 539	(ii)
South American Countries										
	
AR ^e	70	..	..	..	45	..	..	88	..	(iii)
BR	..	..	..	..	..	..	174	..	..	(iii)
CL	..	..	..	..	..	..	..	111	..	(iii)
VE	..	..	..	..	..	..	..	..	..
Developed Asian Economies										
	19 100	34 200	52 600	54 100	53 900	52 600	54 281	57 539	61 300	
JP	18 352	31 069	45 314	46 180	44 865	42 135	41 689	43 643	..	(ii)
KR	380	2 386	5 130	5 775	6 693	7 958	9 786	10 719	..	(iv)
SG	..	..	..	..	..	..	316	347	..	(iii, iv)
TW	347	648	1 951	1 887	2 053	2 246	2 490	2 830	..	(iv)

Table A.2.6: R&D Expenditure Financed by the Business Enterprise Sector

Million 1990 PPS (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										
	
ID	245	..	..	(iii)
MY	185	..	..	..	..	(iii)
PH	61	..	..	..	..	(iii)
TH	..	62	..	..	..	..	..	51	..	(iii)
China and Hong Kong										
	
CN	
HK	9	..	(iii)
Other Asian Countries										
	
PK	
IN	1 030	1 509	2 151	2 183	2 413	2 572	1 649	..	..	(iv)
Oceania										
	1 553	1 700	1 964	2 200	2 300	2 300	..	
AU	1 431	..	1 837	..	2 095	..	..	(ii)
NZ	122	111	127	157	..	..	..	(ii)
Other Countries										
	900	993	1 000	969	1 000	..	..
IL	381	399	439	456	..	..	..	(iii, iv)
ZA	594	..	513	..	..	..	(iii)
Mediterranean Countries										
	
AL	
CY	2	2	..	..	..	..	(iv)
DZ	
EG	
IL	381	399	439	456	..	..	..	(iii, iv)
LB	
MA	
MT	
SY	
TN	
TR	235	401	467	429	..	..	..	(ii)

Notes

These notes are specifically for funding; for general notes on gross R&D expenditure please refer to table A.2.1.

a Excluding Luxembourg

b Break in series between 1990 and 1991 because of unification

c Data include extramuros R&D expenditure (in contrast to the tables on expenditure, also after 1991)

d Including foreign funds and other funds

e Productive funds included with government funds

Source: (i) Eurostat (ii) OECD (iii) UNESCO (iv) national source (v) estimations by CSRS, Moscow according to the OECD Frascati standards

Table A.2.7: R&D Expenditure Financed by the Government Sector

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU) a										
	30 298	36 525	41 477	41 975	40 569	40 843	39 947	40 388	40 794	
B	633	688	..	800	..	805	..	..	..	(i)
DK	356	421	541	539	537	549	..	..	..	(ii)
D b	..	9 622	10 063	11 415	11 147	10 986	11 033	10 928	10 860	(i)
DD	..	..	..	..	..	..	..	..	..
EL	..	144	..	189	..	201	..	..	..	(ii)
E	703	899	1 629	1 738	2 011	2 046	1 964	..	..	(i)
F	6 873	9 391	10 655	10 813	9 791	9 814	9 327	..	..	(ii)
IRL	..	112	96	102	107	144	132	156	..	(i, ii)
I c	2 341	4 328	5 733	5 345	5 109	5 195	4 750	4 898	4 751	(ii)
L	..	..	..	..	..	..	..	..	..
NL	1 588	1 728	2 304	2 255	2 238	2 263	2 152	..	..	(i, ii)
A	..	618	754	857	876	904	998	999	966	(i, ii)
P	123	..	288	..	345	..	..	360	..	(ii)
FIN	..	..	..	589	..	584	..	638	..	(i, ii)
S	..	1 264	..	1 307	..	1 218	..	..	..	(ii)
UK	..	6 897	6 487	6 065	5 945	5 990	6 125	6 069	..	(i, ii)
European Free Trade Association (EFTA)										
	1 100	1 200	1 700	1 700	1 800	1 900	..	..	..
IS	..	17	29	36	40	37	39	42	45	(ii)
NO	399	465	..	626	..	690	..	..	..	(ii)
CH	..	..	..	..	1 084	..	..	..	..	(ii)
Central European Free Trade Association (CEFTA)										
	..	..	..	..	1 500	1 400	1 498	1 456	..	
CZ d	..	..	..	503	300	228	268	299	..	(iii, ii)
SK	..	..	..	..	..	..	107	115	..	(iv)
CS	847	901	..	..	..	..	..	..	..	(iii)
HU	368	285	274	225	222	200	247	189	..	(iii, ii)
PL	..	..	..	..	..	..	877	853	..	(ii)
Other European Countries										
	..	..	..	..	..	..	..	4 187	..	
BG	198	322	..	..	139	..	..	91	..	(iii, iv)
RO	..	..	..	..	125	437	355	373	..	(iii, iv)
RU	..	..	..	..	..	..	..	2 486	..	(iv)
UA	..	..	..	..	..	..	..	457	..	(iv, v)
TR	..	..	611	985	884	879	656	780	..	(ii)
North American Free Trade Association (NAFTA)										
	..	65 900	62 500	59 600	58 000	57 054	56 100	55 241	53 500	
CA	2 299	3 097	3 324	3 337	..	3 373	..	3 345	3 206	(ii)
MX	..	..	..	..	..	796	968	930	..	(ii)
US	47 055	62 336	58 356	55 527	53 916	52 886	51 736	50 966	49 279	(ii)
South American Countries										
	
AR e	595	..	..	..	482	..	..	660	..	(iii)
BR	..	..	..	..	..	..	785	..	..	(ii)
CL	..	..	..	..	..	..	..	376	..	(iii)
VE	..	..	..	..	678	..	..	..	..	(iii)
Developed Asian Economies										
	8 100	9 500	11 700	12 800	13 700	14 900	15 030	16 930	18 100	
JP	7 184	8 018	9 368	9 778	10 350	11 313	11 093	12 381	..	(ii)
KR	654	782	1 046	1 397	1 395	1 598	1 854	2 490	..	(iv)
SG	..	..	..	..	..	..	219	222	..	(iii, iv)
TW	244	570	1 143	1 483	1 749	1 759	1 864	1 836	..	(iv)

Table A.2.7: R&D Expenditure Financed by the Government Sector

Million 1990 PPS (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										
	
ID	51	..	..	(iii)
MY	229	..	..	..	..	(iii)
PH	98	..	..	..	..	(iii)
TH	..	311	..	..	..	..	..	331	..	(iii)
China and Hong Kong										
	
CN	
HK	281	..	(iii)
Other Asian Countries										
	
PK	
IN	2 754	5 421	6 712	6 601	6 719	..	8 400	..	..	(iv)
Oceania										
	2 162	2 200	2 356	2 500	2 500	2 500	..	
AU	1 911	..	2 103	..	2 215	..	..	(ii)
NZ	251	250	253	254	..	..	..	(ii)
Other Countries										
	800	817	900	898	900	..	..
IL	378	406	439	495	..	..	..	(iii, iv)
ZA	412	..	403	..	..	..	(iii)
Mediterranean Countries										
	
AL	
CY	9	10	..	..	..	..	(iv)
DZ	
EG	
IL	378	406	439	495	..	..	..	(iii, iv)
LB	
MA	
MT	
SY	
TN	
TR	611	985	884	879	..	..	..	(ii)

Notes

These notes are specifically for funding; for general notes on gross R&D expenditure please refer to table A.2.1.

a Excluding Luxembourg

b Break in series between 1990 and 1991 because of unification

c Data include extramuros R&D expenditure (in contrast to the tables on expenditure, also after 1991)

d Not including general university funds

e Including productive funds

Source: (i) Eurostat (iv) national source
(ii) OECD (v) estimations by CSRS, Moscow according to the OECD Frascati standards
(iii) UNESCO

Table A.2.8: R&D Expenditure Financed by Foreign Funds

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU) a										
	2 271	3 071	5 679	5 747	5 737	5 922	6 420	6 474	6 539	
B	5	25	..	76	..	96	..	..	..	(i)
DK	13	19	48	59	82	106	..	..	..	(ii)
D b	..	299	627	617	620	491	497	524	500	(i)
DD	..	..	..	..	..	..	..	..	..
EL	..	..	..	65	..	130	..	..	..	(ii)
E	15	91	246	211	220	254	238	..	..	(i)
F	..	859	1 664	1 768	1 958	1 838	1 858	..	..	(ii)
IRL	..	16	27	34	35	38	49	56	..	(i, ii)
I c	133	304	529	652	435	435	569	405	448	(ii)
L	..	..	..	..	..	..	..	..	..
NL	185	101	96	87	107	249	430	..	..	(i, ii)
A	..	32	53	54	55	49	51	52	52	(i, ii)
P	3	..	22	..	87	..	..	66	..	(ii)
FIN	..	..	..	18	..	26	..	76	..	(i, ii)
S	..	42	..	57	..	99	..	..	..	(ii)
UK	..	1 265	2 148	2 055	1 959	2 110	2 264	2 607	..	(i, ii)
European Free Trade Association (EFTA)										
	..	..	100	100	100	200	..	..	..
IS	..	1	1	2	2	2	2	2	2	(ii)
NO	11	22	..	58	..	76	..	..	..	(ii)
CH	..	..	..	..	71	..	..	..	..	(ii)
Central European Free Trade Association (CEFTA)										
	..	..	..	..	..	..	..	78	..	
CZ	..	..	..	..	..	..	..	31	..	(iii, ii)
SK	..	..	..	..	..	..	4	5	..	(iv)
CS d	..	..	..	..	..	..	..	..	..	(iii)
HU	0	6	10	10	16	12	17	19	..	(iii, ii)
PL	..	..	..	..	..	..	18	23	..	(ii)
Other European Countries										
	
BG	..	..	..	..	..	..	..	..	..
RO	..	..	..	..	1	2	2	19	..	(iii, iv)
RU	..	..	..	..	..	..	..	187	..	(iv)
UA	..	..	..	..	..	..	..	54	..	(iv, v)
TR	..	..	2	2	5	11	17	25	..	(ii)
North American Free Trade Association (NAFTA)										
	
CA	126	494	725	755	..	850	..	924	954	(ii)
MX	..	..	..	..	..	25	138	120	..	(ii)
US	..	..	..	..	..	..	..	..	..
South American Countries										
	
AR	21	..	..	..	11	..	..	26	..	(iii)
BR	..	..	..	..	..	..	..	..	..
CL	..	..	..	..	..	..	..	62	..	(iii)
VE	..	..	..	..	..	..	..	..	..
Developed Asian Economies										
	50	70	70	130	130	83	88	101	110	
JP	28	41	49	56	61	53	63	69	..	(ii)
KR	14	5	2	13	35	19	5	2	..	(iv)
SG	..	..	..	..	..	6	15	26	..	(iii, iv)
TW	1	14	5	51	21	4	6	4	..	(iv)

Table A.2.8: R&D Expenditure Financed by Foreign Funds

Million 1990 PPS (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										
	
ID	23	..	..	(iii)
MY	8	..	..	..	..	(iii)
PH	65	..	..	..	..	(iii)
TH	..	74	..	..	..	..	..	13	..	(iii)
China and Hong Kong										
	
CN	
HK	2	..	(iii)
Other Asian Countries										
	
PK	
IN	
Oceania										
	53	70	87	100	110	110	..	
AU	43	..	76	..	93	..	..	(ii)
NZ	10	10	11	11	..	..	..	(ii)
Other Countries										
	90	90	100	99	100	..	..
IL	75	80	90	89	..	..	..	(iii, iv)
ZA	10	..	..	..	(iii)
Mediterranean Countries										
	
AL	
CY	0	0	..	..	..	..	(iv)
DZ	
EG	
IL	75	80	90	89	..	..	..	(iii, iv)
LB	
MA	
MT	
SY	
TN	
TR	2	2	5	11	..	..	..	(ii)

Notes

These notes are specifically for funding; for general notes on gross R&D expenditure please refer to table A.2.1.

a Excluding Luxembourg

b Break in series between 1990 and 1991 because of unification

c Data include extramuros R&D expenditure (in contrast to the tables on expenditure, also after 1991)

d Included with the business enterprise sector

Source: (i) Eurostat (iv) national source
(ii) OECD (v) estimations by CSRS, Moscow according to the OECD Frascati standards
(iii) UNESCO

Table A.3.1: Total R&D Personnel

FTE

	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
	..	1 343 400	1 493 200	1 577 100	1 570 000	1 577 400	1 578 400	1 574 600	
B b	32 204	34 859	..	40 063	..	..	37 705	38 450	(i, ii)
DK	15 775	19 914	25 047	25 756	26 573	27 304	..	29 350	(i, ii)
D c	..	390 938	431 100	516 331	487 695	475 016	..	..	(i, ii)
DD d	..	128 785	..	..	..	..	..	..	(iv)
EL	..	..	..	10 905	..	14 549	..	..	(i)
E e	35 496	40 654	69 684	72 405	73 320	76 582	80 400	..	(i, ii)
F	..	273 014	292 964	299 201	311 234	314 170	315 159	..	(ii)
IRL	..	5 341	6 846	8 002	8 577	9 397	10 833	..	(i, ii)
I	95 803	117 887	144 917	143 641	142 855	142 171	143 823	..	(i, ii)
L	..	..	..	..	..	..	..	..
NL	53 560	61 400	73 940	72 350	72 310	74 420	78 980	..	(i, ii)
A	..	20 161	..	..	..	24 458	..	..	(i, ii)
P	7 711	..	12 043	..	13 450	..	..	15 540	(i, ii)
FIN	..	23 550	..	29 575	..	30 527	32 331	33 635	(i, ii)
S	..	49 599	..	53 604	..	56 954	..	62 840	(i)
UK f	..	289 000	279 504	268 608	271 689	277 500	..	..	(i)
European Free Trade Association (EFTA)									
	..	..	71 300	70 700	70 700	69 600	67 500	65 300	
IS	..	834	1 188	1 197	1 244	1 363	1 412	1 463	(ii)
NO	15 005	18 426	..	20 252	..	22 091	..	21 900	(i, ii)
CH	..	..	..	..	48 310	..	..	..	(ii)
Central European Free Trade Association (CEFTA)									
	..	..	..	..	..	..	156 291	141 299	
CZ	..	..	..	81 895	60 292	40 793	37 779	22 678	(ii)
SK	..	..	..	..	..	..	17 256	16 183	(iii, iv)
CS gh	171 789	180 439	..	..	..	..	..	..	(iii)
HU h	62 866	48 745	36 384	29 397	24 192	22 609	22 008	19 585	(ii, iii)
PL i	..	..	..	..	..	..	79 248	82 853	(ii)
Other European Countries									
	..	..	2 611 900	2 306 020	2 079 700	1 803 600	1 528 000	1 425 778	
BG	..	..	..	88 733	57 655	..	..	25 055	(iii)
RO	..	..	71 583	74 736	70 468	68 961	58 735	57 451	(iv)
RU j	..	..	1 943 400	1 677 800	1 532 600	1 315 000	1 106 250	1 061 044	(iv)
UA	..	..	494 197	449 782	..	..	..	263 730	(iv)
SU	..	..	..	..	..	..	..	..
TR e	..	29 241	13 951	14 969	15 701	16 087	16 899	18 498	(ii, iii)
North American Free Trade Association (NAFTA)									
	
CA	77 400	103 370	117 190	118 320	123 780	126 910	..	..	(ii)
MX	..	..	..	..	..	26 932	30 501	33 322	(ii)
US	..	..	..	..	..	..	..	..
South American Countries									
	
AR	..	28 900	..	..	..	..	..	32 510	(iii)
BR	..	..	..	..	..	..	..	..
CL ijk	3 985	5 157	..	..	..	..	..	6 370	(ii)
VE i	..	..	..	..	5 333	..	..	..	(iii)
Developed Asian Economies									
	
JP l	548 741	669 115	794 337	802 820	828 480	832 873	827 972	826 656	(ii)
KR dij	30 473	73 516	125 512	131 983	148 947	156 073	190 298	201 661	(iv)
SG dj	..	..	7 094	8 610	10 611	10 748	11 384	13 025	(iv)
TW j	..	45 104	75 233	82 436	77 750	88 433	92 337	102 801	(iv)

Table A.3.1: Total R&D Personnel

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									
	
ID <i>j</i>	22 505	..	..	..	26 169	..	..	..	(iii, iv)
MY <i>dj</i>	4 563	..	6 676	..	(iv)
PH <i>jmn</i>	11 053	..	..	..	15 610	..	..	..	(iii, iv)
TH <i>j</i>	15 721	..	..	..	12 803	(iv)
China and Hong Kong									
	
CN	2 329 170	2 285 048	642 500	..	665 600	(iii)
HK	
Other Asian Countries									
	
PK <i>i</i>	29 040	..	..	..	..	..	(iii)
IN <i>n</i>	184 096	..	300 877	..	293 348	..	336 589	..	(iii, iv)
Oceania									
	77 857	83 000	89 734	93 400	96 400	..	
AU	..	53 259	69 048	..	79 740	..	86 162	..	(ii)
NZ	8 808	8 706	9 932	10 493	..	..	(ii)
Other Countries									
	83 330	..	..
IL	22 120	22 866	..	..	(iv)
ZA <i>o</i>	22 224	..	60 464	..	..	(iii)
Mediterranean Countries									
	
AL	
CY	121	..	..	341	366	..	..	..	(iii, iv)
DZ	681	704	953	1 008	1 063	1 119	(iv)
EG	
IL	22 120	22 866	..	..	(iv)
LB	
MA	..	543	746	779	803	846	888	924	(iv)
MT	122	126	160	165	..	..	(iv)
SY	
TN	787	..	..	944	..	(iv)
TR	..	29 241	13 951	14 969	15 701	16 087	16 899	18 498	(ii, iii)

Notes*a* Not including Luxembourg*b* No data available for public enterprises; data for 1994 and 1995 are provisional*c* 1991 break in series because of unification*d* Excluding social sciences and humanities*e* Data are underestimated because the R&D personnel data for the HE sector only include scientists & engineers (Spain before 1988)*f* Not including R&D personnel in the National Health Service and local authorities*g* Of military R&D, only that part carried out in civil establishments is included (Hungary since 1985)*h* Not including personnel engaged in the administration of R&D*i* Excluding military and defence R&D*j* Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE (Philippines only 1980)*k* Other supporting staff excluded*l* Adjusted series calculated by the OECD Secretariat*m* 1980 PNP organisations excluded*n* Higher education sector excluded*o* Mainly government financed research establishments

Source: (i) Eurostat (iii) UNESCO
(ii) OECD (iv) national source

Table A.3.2: Total Business Enterprise R&D Personnel

FTE	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
	..	785 900	854 900	871 100	863 300	855 800	849 200	839 400	
B b	18 595	20 547	..	22 313	..	..	22 231	22 978	(i, ii)
DK	8 402	10 932	14 605	15 242	15 607	15 973	..	17 195	(i, ii)
D c	..	275 080	..	321 756	306 925	293 772	284 380	274 400	(i, ii)
DD d	..	85 673	..	..	..	..	..	..	(iv)
EL	..	..	..	2 244	..	2 880	..	..	(i)
E	12 303	16 859	28 508	29 151	28 590	27 781	27 320	..	(i, ii)
F	126 495	140 457	153 161	156 300	164 378	164 384	161 955	..	(i, ii)
IRL	..	2 102	3 032	3 971	4 235	4 499	5 325	6 150	(i,ii)
I	48 121	56 222	67 496	65 481	63 458	61 993	63 105	..	(i, ii)
L	..	..	..	..	..	..	..	..
NL	26 590	29 940	31 950	29 970	29 440	30 900	36 040	..	(i, ii)
A	..	12 555	..	..	..	15 114	..	..	(i)
P	1 419	..	1 997	..	1 882	..	..	1 768	(i, ii)
FIN	..	12 050	..	15 028	..	15 180	16 900	17 798	(i, ii)
S	..	33 055	..	33 757	..	35 330	..	41 636	(i)
UK e	..	173 000	171 000	159 000	159 000	163 597	157 386	148 340	(i)
European Free Trade Association (EFTA)									
	..	..	47 800	45 900	44 500	43 200	41 800	..	
IS	..	100	232	278	291	398	418	439	(ii)
NO	7 067	10 086	..	9 967	..	10 689	..	..	(ii)
CH	20 031	..	..	..	33 900	..	..	..	(ii)
Central European Free Trade Association (CEFTA)									
	380 018	307 652	..	..	..	..	62 122	49 276	
CZ	..	..	..	54 435	39 063	27 253	23 114	11 346	(ii)
SK	..	..	..	..	..	..	5 695	4 855	(iii, iv)
CS f	141 333	145 056	..	..	..	..	..	..	(iii)
HU fg	41 985	30 596	18 431	12 990	8 980	8 017	7 782	6 792	(ii, iii)
PL h	196 700	132 000	..	..	..	..	25 531	26 283	(iii, ii)
Other European Countries									
	..	..	..	..	..	..	..	956 925	
BG	48 337	..	..	34 473	16 370	..	..	4 009	(iii)
RO	..	..	..	44 054	42 729	53 482	45 051	43 082	(iii, iv)
RU i	..	..	..	..	..	..	759 810	726 568	(iv)
UA	..	..	..	..	..	..	..	179 632	(iii)
SU	..	..	..	..	..	..	..	..
TR	..	11 190	2 166	2 509	2 824	2 807	3 232	3 634	(ii, iii)
North American Free Trade Association (NAFTA)									
	
CA	28 650	44 930	54 530	54 380	58 130	60 528	65 225	..	(ii)
MX	..	..	..	..	..	1 932	3 876	4 466	(ii)
US	..	..	..	..	..	..	..	..
South American Countries									
	
AR	..	..	..	..	..	..	..	6 576	(iii)
BR	..	..	..	..	..	..	..	6 818	(iii)
CL ij	34	357	..	..	..	..	..	184	(iii)
VE	..	..	..	..	..	..	..	..
Developed Asian Economies									
	
JP	349 480	451 276	558 261	563 018	583 961	583 485	577 725	573 713	(ii)
KR dhi	10 467	31 614	63 523	71 399	81 322	82 117	89 284	100 338	(iv)
SG di	..	..	..	..	6 174	..	6 445	7 238	(iv)
TW i	..	..	..	..	..	56 253	58 970	66 125	(iv)

Table A.3.2: Total Business Enterprise R&D Personnel

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									
	
ID <i>i</i>	8 317	..	..	..	(iv)
MY <i>di</i>	1 078	..	2 500	..	(iv)
PH <i>i</i>	2 902	..	..	..	1 694	..	..	..	(iii, iv)
TH <i>i</i>	1 079	..	..	..	790	(iv, iii)
China and Hong Kong									
	
CN	751 868	885 607	231 400	..	260 200	(iii)
HK	
Other Asian Countries									
	84 837	..	..	..	..	..
PK <i>hk</i>	23 460	..	..	..	..	..	(iii)
IN	61 377	..	64 824	..	65 828	..	(iii, iv)
Oceania									
	23 628	23 928	25 391	26 287	27 900	..	
AU	..	14 784	21 025	21 272	22 883	23 507	25 240	..	(ii)
NZ	2 602	2 512	2 446	2 781	..	..	(ii)
Other Countries									
	
IL	11 615	..	..	..	(iii)
ZA <i>l</i>	8 480	..	21 085	..	..	(iii)
Mediterranean Countries									
	
AL	
CY	49	54	..	..	..	(iv)
DZ	
EG	
IL	11 615	..	..	..	(iii)
LB	
MA	
MT	
SY	
TN	
TR	..	11 190	2 166	2 509	2 824	2 807	3 232	3 634	(ii, iii)

Notes*a* Not including Luxembourg*b* No data available for public enterprises; data for 1994 and 1995 are provisional*c* Break in series because of unification*d* Excluding social sciences and humanities*e* Not including R&D personnel in the National Health Service and local authorities*f* Of military R&D, only that part carried out in civil establishments is included (Hungary since 1985)*g* Not including personnel engaged in the administration of R&D*h* Excluding military and defence R&D*i* Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE (Philippines only 1980)*j* Other supporting staff excluded*k* Government sector included*l* Mainly government financed research establishments

Source: (i) Eurostat

(iii) UNESCO

(ii) OECD

(iv) national source

Table A.3.3: Total Government R&D Personnel

FTE	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
	..	248 900	264 400	291 400	272 000	268 300	268 700	267 000	
B b	1 337	1 410	..	2 611	..	..	2 026	2 021	(i), (ii)
DK	3 305	4 199	4 402	4 380	4 648	4 829	..	..	(i, ii)
D cd	..	53 670	..	90 711	73 500	71 224	..	..	(i)
DD e	..	30 294	..	..	..	..	..	..	(iv)
EL	..	..	..	4 491	..	4 828	..	4 908	(i)
E	11 400	10 031	17 170	17 519	16 679	17 267	17 549	..	(i, ii)
F	..	68 701	70 962	71 505	67 934	67 958	68 082	..	(ii)
IRL	..	1 855	1 013	1 004	1 016	1 049	1 079	..	(i, ii)
I	20 034	24 643	33 113	32 567	32 868	33 164	32 768	..	(i, ii)
L	..	..	..	..	..	..	..	..
NL	12 440	13 760	14 950	14 890	14 930	15 190	15 970	..	(i, ii)
A	..	1 778	..	..	..	2 107	..	..	(i)
P	3 711	..	4 230	..	3 956	..	..	4 790	(i, ii)
FIN d	..	5 493	..	6 654	..	6 655	6 849	6 691	(i)
S	..	2 823	..	2 965	..	3 289	..	3 400	(i)
UK f	68 400	52 000	37 057	35 989	37 569	34 280	32 158	28 919	(i, ii)
European Free Trade Association (EFTA)									
	..	..	6 700	6 633	6 800	7 000	7 000	..	
IS	..	396	534	471	476	538	554	570	(ii)
NO d	3 080	3 440	..	4 312	..	4 744	..	..	(i, ii)
CH	..	..	1 850	1 850	1 760	..	1 600	..	(ii)
Central European Free Trade Association (CEFTA)									
	64 096	71 577	..	..	..	..	50 690	42 953	
CZ	..	..	..	24 663	19 448	10 799	11 268	7 643	(ii)
SK	..	..	..	..	..	..	7 276	6 780	(iii, iv)
CS g	25 468	30 108	..	..	..	..	..	..	(iii)
HU gh	12 228	10 169	9 110	7 949	7 295	6 816	6 615	6 843	(ii, iii)
PL i	26 400	31 300	..	..	..	..	20 964	21 687	(iii, ii)
Other European Countries									
	..	..	..	..	..	..	..	361 423	
BG	13 116	..	..	35 539	19 359	..	..	13 838	(iii)
RO	..	..	..	14 531	14 539	11 869	9 649	9 239	(iii, iv)
RU j	..	..	..	..	..	..	289 424	282 166	(iv)
UA	..	..	..	..	..	..	..	53 100	(iii)
SU	..	..	..	..	..	..	..	..
TR	..	..	3 365	3 692	3 788	3 062	2 955	3 080	(ii, iii)
North American Free Trade Association (NAFTA)									
	
CA	19 030	19 750	20 150	20 320	20 240	19 900	..	..	(ii)
MX	..	..	..	..	..	13 835	13 702	13 668	(ii)
US	..	..	..	..	..	..	..	..
South American Countries									
	
AR	..	..	..	..	..	..	..	9 626	(iii)
BR	..	..	..	..	..	..	..	..
CL ijk	750	226	..	..	..	..	..	308	(iii)
VE	..	..	..	..	..	..	..	..
Developed Asian Economies									
	
JP	53 724	53 538	54 729	55 015	55 376	56 015	55 633	55 990	(ii)
KR dij	9 822	13 218	18 407	19 008	24 233	26 320	26 137	25 621	(iv)
SG dj	..	..	..	..	1 950	..	2 392	2 712	(iv)
TW j	..	..	..	..	..	16 737	17 046	19 850	(iv)

Table A.3.3: Total Government R&D Personnel

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									
	
ID	
MY <i>dj</i>	2 330	..	3 661	..	(iv)
PH	8 509	..	..	..	6 065	..	..	..	(iii, iv)
TH <i>j</i>	7 158	..	..	..	8 078	(iv, iii)
China and Hong Kong									
	
CN	833 954	750 677	270 000	..	266 200	(iii)
HK	
Other Asian Countries									
	..	181 100	..	..	..	..	..	..
PK <i>il</i>	(iii)
IN	239 500	..	228 524	..	248 661	..	(iii, iv)
Oceania									
	23 500	23 600	23 600	23 400	23 000	..	
AU	..	17 519	19 660	..	19 799	..	19 134	..	(ii)
NZ	3 880	3 868	3 751	3 977	..	..	(ii)
Other Countries									
	
IL	
ZA <i>m</i>	7 211	..	17 709	..	..	(iii)
Mediterranean Countries									
	
AL	
CY	292	312	..	..	..	(iii)
DZ	
EG	
IL	
LB	
MA	
MT	
SY	
TN	1 755	..	..	..	(iii)
TR	3 365	3 692	3 788	3 062	2 955	3 080	(ii, iii)

Notes*a* Not including Luxembourg*b* Data for 1994 and 1995 are provisional*c* Break in series between 1990 and 1991 because of unification*d* PNP sector included (Finland since 1994)*e* Excluding social sciences and humanities*f* Not including R&D personnel in the National Health Service and local authorities*g* Of military R&D, only that part carried out in civil establishments is included (Hungary since 1985)*h* Not including personnel engaged in the administration of R&D*i* Of military R&D, only that part carried out in civil establishments is included*j* Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE*k* Other supporting staff excluded*l* Included with business enterprise sector*m* Mainly government financed research establishments

Source: (i) Eurostat

(ii) OECD

(iii) UNESCO

(iv) national source

Table A.3.4 : Total Higher Education R&D Personnel

FTE	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
	..	..	349 300	389 800	409 600	425 700	435 000	442 500	
B b	10 617	11 042	..	14 800	..	..	13 034	13 015	(i, ii)
DK	3 886	4 592	5 731	5 796	6 006	6 216	..	..	(i, ii)
D c	..	62 188	..	103 864	107 270	110 020	..	..	(i)
DD d	..	12 818	..	..	..	..	..	..	(iv)
EL	..	..	..	4 170	..	6 767	..	9 417	(i)
E e	..	..	23 654	25 359	27 552	30 685	34 642	..	(i)
F	..	59 061	63 502	66 079	72 625	74 876	78 132	..	(ii)
IRL	..	1 258	2 549	2 744	3 010	3 589	4 169	..	(i, ii)
I	27 648	37 022	44 308	45 593	46 529	47 014	47 950	..	(i)
L	..	..	..	..	..	..	..	..
NL	13 010	16 180	25 380	25 730	26 170	26 530	26 050	..	(i, ii)
A	..	5 347	..	..	..	7 136	..	..	(i)
P	2 378	..	4 840	..	6 249	..	..	5 894	(i, ii)
FIN	..	..	..	7 662	..	8 422	8 582	9 146	(i, ii)
S	..	13 600	..	16 810	..	17 765	..	17 301	(i)
UK f	..	52 000	56 848	59 153	61 821	65 527	..	..	(i)
European Free Trade Association (EFTA)									
	..	..	16 700	18 000	19 400	19 400	18 600	..	
IS	..	284	317	397	420	374	385	396	(ii)
NO	4 858	4 900	..	5 973	..	6 658	..	..	(i, ii)
CH	..	..	..	..	12 650	..	12 150	..	(ii)
Central European Free Trade Association (CEFTA)									
	..	..	..	..	..	..	48 038	49 425	
CZ	..	..	..	2 797	1 781	2 741	3 397	3 689	(ii)
SK	..	..	..	..	..	..	4 285	4 543	(iii, iv)
CS g	4 988	5 275	..	..	..	..	..	..	(iii)
HU gh	8 653	7 980	8 843	8 458	7 917	7 776	7 611	6 310	(ii, iii)
PL i	..	..	..	..	..	..	32 745	34 883	(ii)
Other European Countries									
	
BG	..	..	..	18 721	21 926	..	..	7 208	(iii)
RO	..	..	..	2 127	1 906	1 991	1 755	2 349	(iii, iv)
RU j	..	..	..	..	..	..	56 818	52 065	(iv)
UA	..	..	..	..	..	..	..	30 998	(iii)
SU	..	..	..	..	..	..	..	..
TR	..	..	..	..	..	..	..	..
North American Free Trade Association (NAFTA)									
	
CA	28 530	37 530	41 100	41 940	43 660	44 620	..	..	(ii)
MX	..	..	..	..	..	10 988	12 703	14 889	(ii)
US	..	..	..	..	..	..	..	..
South American Countries									
	
AR	..	..	..	..	..	..	..	16 308	(iii)
BR	..	..	..	..	..	..	..	62 247	(iii)
CL ijk	3 201	4 574	..	..	..	..	..	5 878	(iii)
VE	..	..	..	..	..	..	..	..
Developed Asian Economies									
	
JP l	131 931	144 613	154 468	156 824	160 506	164 464	166 392	169 118	(ii)
KR dij	10 184	25 124	43 582	41 576	43 392	47 636	74 877	75 702	(iv)
SG dj	..	..	..	2 317	2 487	2 501	2 547	3 075	(iv)
TW j	..	..	..	..	..	15 443	16 321	16 826	(iv)

Table A.3.4 : Total Higher Education R&D Personnel

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									
ID	
MY <i>d</i>	1 155	..	492	..	(iv)
PH	6 929	..	..	..	(iv)
TH <i>j</i>	7 301	..	..	..	3 935	(iv, iii)
China and Hong Kong									
CN	140 827	
HK	743 348	648 764	141 100	..	139 200	(iii)
	1 627	(iii)
Other Asian Countries									
PK <i>di</i>	
IN	5 580	..	..	..	..	..	(iii)
Oceania									
AU	..	20 143	27 081	..	35 418	..	40 096	..	(ii)
NZ	2 326	2 326	3 735	3 735	..	..	(ii)
Other Countries									
IL	
ZA <i>m</i>	6 533	..	21 670	..	..	(iii)
Mediterranean Countries									
AL	
CY	
DZ	
EG	
IL	
LB <i>n</i>	206	..	..	..	..	..	..	..	(iii)
MA	
MT	..	46	..	..	..	..	..	..	(iii)
SY	
TN	5 446	..	..	..	(iii)
TR	

Notes*a* Not including Luxembourg*b* Data for 1994 and 1995 are provisional*c* Break in series between 1990 and 1991 because of unification*d* Excluding social sciences and humanities*e* Data are underestimated because the R&D personnel data for the HE sector only include scientists & engineers (Spain before 1988)*f* Not including R&D personnel in the National Health Service and local authorities*g* Of military R&D, only that part carried out in civil establishments is included*h* Not including personnel engaged in the administration of R&D*i* Excluding military and defence R&D*j* Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE*k* Other supporting staff excluded*l* Adjusted series calculated by the OECD Secretariat*m* Mainly government financed research establishments*n* Data refer only to the Faculty of Science at the University of Lebanon

Source: (i) Eurostat (iii) UNESCO
(ii) OECD (iv) national source

Table A.3.5: Total Scientists and Engineers (RSEs)

FTE

	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
	..	563 400	681 700	749 600	765 600	781 100	807 000	826 000	
B b	12 583	14 759	..	18 104	..	..	22 552	22 919	(i, ii)
DK	6 393	8 567	11 505	12 049	12 861	13 611	..	..	(i, ii)
D c	..	147 418	..	241 869	234 280	229 837	..	..	(i, ii)
DD d	..	53 990	..	..	..	..	..	..	(iv)
EL	..	..	..	6 230	..	8 015	..	..	(i, ii)
E	18 323	21 455	37 676	40 641	41 687	43 368	47 870	..	(i, ii)
F	..	102 253	123 938	129 780	141 710	145 898	149 193	..	(ii)
IRL	..	2 813	4 618	5 161	5 611	6 398	7 408	..	(ii)
I	46 999	63 759	77 876	75 238	74 422	74 434	75 722	..	(i, ii)
L	..	..	..	..	..	..	..	..
NL	..	24 150	..	..	..	32 200	34 200	..	(i, ii)
A	..	7 609	..	..	..	12 821	..	..	(i)
P	2 663	..	5 908	..	7 647	..	7 779	11 599	(i, ii)
FIN	..	..	..	16 937	..	18 588	..	20 859	(i, ii)
S e	..	21 899	..	26 515	..	30 495	..	..	(i)
UK f	..	131 000	133 057	131 367	134 480	139 183	145 792	..	(i)
European Free Trade Association (EFTA)									
	18 900	24 200	30 400	31 700	33 000	34 200	35 000	36 300	
IS	..	468	676	687	708	815	845	876	(ii)
NO	7 427	9 692	..	13 460	..	14 763	..	..	(ii)
CH	..	..	..	..	18 230	..	..	..	(ii)
Central European Free Trade Association (CEFTA)									
	172 548	140 125	..	..	..	..	82 759	81 934	
CZ	..	..	..	..	20 084	13 627	13 325	11 936	(ii)
SK	..	..	..	..	..	..	10 249	9 711	(iii, iv)
CS g	53 659	61 046	..	..	..	..	..	..	(iii)
HU gh	25 589	22 479	17 550	14 471	12 311	11 818	11 752	10 499	(ii, iii)
PL i	93 300	56 600	..	..	41 440	..	47 433	49 788	(iii, ii)
Other European Countries									
	..	..	1 426 900	1 263 465	1 144 700	953 200	788 700	741 628	
BG	38 706	48 008	..	49 705	37 825	..	..	13 990	(iii)
RO	..	..	..	28 302	28 203	35 627	30 766	29 795	(iii, iv)
RU j	..	..	992 600	878 500	804 000	644 900	525 319	518 690	(iv)
UA j	195 782	210 300	313 079	295 010	..	..	..	163 299	(iii, iv)
SU j	1 373 300	1 491 300	1 694 400	..	..	..	..	..	(iii)
TR	..	11 276	11 225	11 948	12 573	13 605	14 460	15 854	(ii, iii)
North American Free Trade Association (NAFTA) k									
	689 970	855 710	1 009 000	1 029 300	1 034 700	1 053 357	1 051 800	1 064 400	
CA	38 770	53 810	66 840	68 800	73 136	76 554	..	..	(ii)
MX	..	..	..	..	..	14 103	17 061	19 433	(ii)
US	651 200	801 900	..	960 500	..	962 700	..	..	(ii)
South American Countries									
	
AR	9 500	10 800	..	..	..	13 992	16 603	22 927	(iii, iv)
BR ij	21 384	52 863	..	..	..	35 600	..	26 754	(iii)
CL ij	..	..	5 538	5 721	5 926	6 175	6 429	..	(iv)
VE ij	3 673	5 356	..	..	4 258	..	..	..	(iii)
Developed Asian Economies									
	
JP l	298 974	380 761	477 866	491 102	511 407	526 501	541 015	551 990	(ii)
KR dij	18 434	41 473	70 503	76 252	88 764	98 764	117 446	120 915	(iv)
SG dj	..	..	4 329	5 218	6 454	7 860	8 660	10 100	(iv)
TW j	13 656	24 600	46 071	46 173	48 356	52 420	55 405	63 457	(iv)

Table A.3.5: Total Scientists and Engineers (RSEs)

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									
	
ID <i>j</i>	..	21 160	..	16 910	..	..	..	..	(iii, iv)
MY <i>d</i>	1 633	..	2 287	..	(iii, iv)
PH <i>j</i>	5 403	..	..	..	..	..	..	..	(iii)
TH <i>j</i>	6 923	7 756	..	9 752	..	..	..	6 899	(iii)
China and Hong Kong									
	
CN	1 349 927	1 335 336	418 500	..	422 700	(iii)
HK	
Other Asian Countries									
	..	89 700	112 562	..	..	..	..	..
PK <i>i</i>	6 626	..	..	..	..	..	(iii)
IN <i>m</i>	64 875	81 600	105 936	..	95 486	..	136 503	..	(iv)
Oceania									
	48 069	52 200	58 027	60 500	62 600	..	
AU	..	29 866	43 176	..	52 124	..	56 521	..	(ii)
NZ	4 893	4 752	5 903	6 200	..	..	(ii)
Other Countries									
	
IL	
ZA <i>n</i>	12 102	..	37 192	..	..	(iii)
Mediterranean Countries									
	
AL	
CY	45	..	..	135	147	..	..	..	(iii, iv)
DZ	
EG	
IL	
LB	
MA	
MT	
SY	
TN	
TR	..	11 276	11 225	11 948	12 573	13 605	14 460	15 854	(ii, iii)

Notes*a* Not including Luxembourg*b* No data available for public enterprises; data for 1994 and 1995 are provisional*c* Break in series because of unification*d* Excluding social sciences and humanities*e* Until 1991 excluding social sciences and humanities performed by the government sector*f* Not including R&D personnel in the National Health Service and local authorities*g* Of military R&D, only that part carried out in civil establishments is included (Hungary since 1985)*h* Not including personnel engaged in the administration of R&D*i* Excluding military and defence R&D*j* Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE*k* Not including Mexico before 1993*l* Adjusted series calculated by the OECD Secretariat*m* Since 1985 higher education sector excluded*n* Mainly government financed research establishments

Source: (i) Eurostat (iii) UNESCO
(ii) OECD (iv) national source

Table A.3.6: Business Enterprise Scientists and Engineers

FTE

	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
	..	289 300	351 400	374 200	378 100	382 400	390 200	396 800	
B b	5 140	6 936	..	8 750	..	..	11 451	11 789	(i, ii)
DK	2 145	3 393	4 787	5 155	5 519	5 884	..	6 675	(i, ii)
D c	..	93 545	..	141 084	134 600	128 956	..	..	(i, ii)
DD d	..	34 025	..	..	..	..	..	..	(iv)
EL	..	..	..	1 042	..	1 337	..	..	(i, ii)
E	2 994	4 853	11 007	11 622	11 593	11 256	11 070	..	(i, ii)
F	33 530	43 862	57 030	59 594	64 688	66 455	66 714	..	(i, ii)
IRL	..	1 077	1 730	2 128	2 352	2 576	2 982	3 383	(ii)
I	17 953	24 462	31 530	29 577	28 479	27 932	28 228	..	(i, ii)
L	..	..	..	..	..	..	..	..
NL	..	10 280	..	..	..	11 370	13 140	..	(ii)
A	..	3 359	..	..	..	6 995	..	..	(i, ii)
P	375	..	437	..	481	..	..	952	(i)
FIN	..	3 891	..	7 849	..	8 481	..	10 378	(i, ii)
S	..	11 481	..	13 319	..	15 500	..	19 054	(i)
UK e	..	81 000	83 000	80 000	82 000	86 031	83 160	84 485	(i)
European Free Trade Association (EFTA)									
	8 100	12 700	16 100	16 600	16 900	17 400	17 800	18 500	
IS	..	62	133	168	178	273	287	301	(ii)
NO	3 040	4 796	..	6 724	..	7 141	..	..	(ii)
CH	5 047	..	..	..	9 800	..	..	..	(ii)
Central European Free Trade Association (CEFTA)									
	..	85 305	..	..	..	..	23 235	21 119	
CZ	..	..	..	..	10 565	7 583	6 628	4 936	(ii)
SK	..	..	..	..	..	..	2 648	2 102	(iii, iv)
CS f	40 259	44 667	..	..	..	..	..	..	(iii)
HU fg	14 993	12 838	7 629	5 341	3 724	3 503	3 330	2 926	(ii, iii)
PL h	65 500	27 800	..	..	19 110	..	10 629	11 155	(iii, ii)
Other European Countries									
	..	..	..	..	..	..	..	468 080	
BG	19 579	..	..	18 897	9 346	..	..	1 865	(iii)
RO	..	..	..	19 613	19 542	26 880	23 346	22 050	(iii, iv)
RU i	..	..	814 000	708 700	643 000	502 100	343 346	336 671	(iv)
UA	..	..	..	..	..	..	..	105 283	(iii)
SU	..	..	1 125 900	..	..	..	..	..	(iii)
TR	..	1 179	1 168	1 280	1 496	1 613	1 992	2 211	(ii, iii)
North American Free Trade Association (NAFTA) j									
	482 300	669 480	788 357	806 683	817 036	800 851	799 105	793 900	
CA	13 100	22 680	29 857	30 283	33 236	35 484	38 551	..	(ii)
MX	..	..	..	..	..	867	1 754	2 006	(ii, iii)
US	469 200	646 800	758 500	776 400	783 800	764 500	758 800	..	(ii)
South American Countries									
	
AR	1 700	..	..	..	..	..	..	3 639	(iii)
BR	..	..	..	..	..	..	..	2 895	(iii)
CL	..	..	..	..	..	..	..	..
VE hi	28	..	..	..	..	..	..	..	(iii)
Developed Asian Economies									
	
JP	184 889	251 771	330 996	340 809	356 406	367 278	376 639	384 100	(ii)
KR dhi	5 141	18 996	38 737	45 043	51 074	54 078	59 281	60 025	(iv)
SG di	..	..	1 363	2 315	3 187	4 354	4 882	5 593	(iv)
TW i	..	..	..	..	..	29 356	31 641	37 353	(iv)

Table A.3.6: Business Enterprise Scientists and Engineers

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									
	
ID <i>i</i>	3 700	..	..	..	8 330	(iv, iii)
MY <i>d</i>	394	..	1 117	..	(iv)
PH <i>i</i>	951	..	..	..	..	..	..	..	(iii)
TH <i>i</i>	577	..	..	..	327	(iv, iii)
China and Hong Kong									
	
CN	303 162	372 643	92 600	..	103 800	(iii)
HK	
Other Asian Countries									
		31 300	36 826	..	..	..	..	..
PK <i>hk</i>	5 460	..	..	..	..	..	(iii)
IN	31 366	..	37 182	..	37 290	..	(iii, iv)
Oceania									
	14 099	14 545	15 260	15 524	16 100	..	
AU	..	7 397	12 604	13 110	13 913	14 016	14 639	..	(ii)
NZ	1 495	1 355	1 321	1 507	..	..	(ii)
Other Countries									
	
IL	7 056	..	..	..	(iii)
ZA <i>l</i>	3 395	..	11 134	..	..	(iii)
Mediterranean Countries									
	
AL	
CY	28	29	..	..	..	(iii, iv)
DZ	
EG	
IL	7 056	..	..	..	(iii)
LB	
MA	
MT	
SY	
TN	
TR	..	1 179	1 168	1 280	1 496	1 613	1 992	2 211	(ii, iii)

Notes

- a Not including Luxembourg
b No data available for public enterprises; data for 1994 and 1995 are provisional
c Break in series between 1990 and 1991 because of unification
d Excluding social sciences and humanities
e Not including R&D personnel in the National Health Service and local authorities
f Of military R&D, only that part carried out in civil establishments is included (Hungary since 1985)
g Not including personnel engaged in the administration of R&D
h Excluding military and defence R&D
i Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE
j Not including Mexico before 1993
k Government sector included
l Mainly government financed research establishments

Source: (i) Eurostat (iii) UNESCO
(ii) OECD (iv) national source

Table A.3.7: Business Enterprise Scientists and Engineers by Region

FTE

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
BELGIUM a	6 936	7 820	8 128	8 533	8 371	..	8 750	..	..	11 451	11 789
Vlaams Gewest	3 894	4 495	4 858	5 179	..	..	..	..	..	8 038	8 224
Region Wallonne	1 300	1 462	1 505	1 569	..	..	..	..	..	2 261	2 352
Bruxelles-Brussels	1 492	1 595	1 498	1 517	..	..	..	..	..	1 152	1 213
Not registered by region	250	268	267	268	..	..	..	..	..	-	-
DENMARK	3 393	3 728	4 066	4 241	4 418	4 787	5 155	5 519	5 884	..	6 675
København Og Frederiksberg Kommuner	..	..	..	..	..	..	..	..	..	..	..
Københavns Amt	..	..	..	..	..	..	..	..	..	..	..
Frederiksborg Amt	..	..	..	..	..	..	..	..	..	..	..
Roskilde Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	2 517	..	3 153	..	3 421	..	4 032	..	..	..	..
Vestsjællands Amt	..	..	..	..	..	..	..	..	..	..	..
Storstrøms Amt	..	..	..	..	..	..	..	..	..	..	..
Bornholms Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	21	..	31	..	39	..	69	..	47	..	..
Fyns Amt	59	..	64	..	95	..	93	..	115	..	..
Sønderjyllands Amt	..	..	..	..	..	..	..	..	..	..	..
Ribe Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	166	..	100	..	101	..	147	..	175	..	..
Vejle Amt	..	..	..	..	..	..	..	..	..	..	..
Ringkøbing Amt	..	..	..	..	..	..	..	..	..	..	..
Viborg Amt	..	..	..	..	..	..	..	..	..	..	..
Sub-Total	178	..	234	..	224	..	247	..	385	..	..
Århus Amt	176	..	323	..	388	..	375	..	452	..	..
Nordjyllands Amt	111	..	155	..	151	..	192	..	153	..	..
Not registered by region	165	..	7	..	-	..	-	..	-	..	..
GERMANY b	93 545	..	107 113	..	113 247	..	141 084	134 600	128 956	..	..
GREECE	..	517	..	742	760	..	1 042	..	1 337	..	..
Voreia Ellada..	56	..	90	73	..	..	..	202	..	..	..
Anatoliki Makedonia, Thraki	..	8	..	6	6	..	..	..	39	..	..
Kentriki Makedonia	..	40	..	56	46	..	..	..	131	..	..
Dytiki Makedonia	..	-	..	1	1	..	..	..	7	..	..
Thessalia	..	8	..	27	20	..	..	..	25	..	..
Kentriki Ellada..	75	..	98	82	..	..	..	161	..	..	..
Ipeiros	..	-	..	-	1	..	..	..	14	..	..
Ionia Nisia	..	-	..	-	-	..	..	..	3	..	..
Dytiki Ellada	..	18	..	23	34	..	..	..	17	..	..
Stereia Ellada	..	56	..	69	44	..	..	..	90	..	..
Peloponnisos	..	1	..	6	3	..	..	..	37	..	..
Attiki	..	384	..	524	584	..	..	..	945	..	..
Nisia Aigaiou, Kriti	..	2	..	30	21	..	..	..	29	..	..
Voreio Aigaio	..	-	..	-	-	..	..	..	2	..	..
Notio Aigaio	..	-	..	20	15	..	..	..	9	..	..
Kriti	..	2	..	10	6	..	..	..	18	..	..

Table A.3.7: Business Enterprise Scientists and Engineers by Region

FTE (continued)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
IRELAND	1 077	1 314	1 322	1 339	1 534	1 730	2 128	2 352	2 576	..	..
East	..	501	..	548	..	756	..	..	1 001	..	..
South West (IRL)	..	172	..	190	..	179	..	..	379	..	..
South East (IRL)	..	123	..	105	..	105	..	..	148	..	..
North East	..	38	..	37	..	31	..	..	87	..	..
Mid West	..	221	..	246	..	244	..	..	322	..	..
Donegal	..	8	..	6	..	11	..	..	30	..	..
Midlands	..	146	..	88	..	231	..	..	362	..	..
West	..	92	..	103	..	145	..	..	229	..	..
North West (IRL)	..	13	..	16	..	28	..	..	19	..	..
ITALY	24 462	26 498	27 767	29 905	30 520	31 530	29 577	28 479	27 932	28 228	..
LUXEMBOURG
NETHERLANDS	10 280	..	10 750	..	10 720	..	..	..	11 370	13 140	..
AUSTRIA	3 359	..	..	..	4 010	..	..	..	6 995	..	..
Ostösterreich	2 544	..	..	..	4 498	..	..
Burgenland	16	..	..	..	67	..	..
Niederösterreich	328	..	..	..	424	..	..
Wien	2 201	..	..	..	4 007	..	..
Südösterreich	638	..	..	..	912	..	..
Kärnten	59	..	..	..	64	..	..
Steiermark	578	..	..	..	848	..	..
Westösterreich	828	..	..	..	1 584	..	..
Oberösterreich	522	..	..	..	839	..	..
Salzburg	72	..	..	..	159	..	..
Tirol	140	..	..	..	282	..	..
Vorarlberg	94	..	..	..	302	..	..
PORTUGAL	..	784	..	474	..	437	..	481	..	..	952
Continente	472	..	435	..	..	..	..	947
Norte	122	..	80	..	..	..	..	267
Centro (P)	96	..	104	..	..	..	..	188
Lisboa E Vale Do Tejo	248	..	249	..	..	..	..	485
Alentejo	6	..	3	..	..	..	..	7
Algarve	-	..	-	0
Acores	-	..	-	0
Madeira	-	..	1	..	..	..	..	4
FINLAND	3 891	..	4 608	..	7 712	..	7 849	..	8 481	..	10 378
SWEDEN	11 481	..	12 243	..	12 326	..	13 319	..	15 500	..	19 054
UNITED KINGDOM ^d	81 000	87 000	87 000	89 000	85 000	83 000	80 000	82 000	86 031	83 160	84 485
North	1 759	2 694	2 603
Yorkshire and Humberside	2 743	2 798	2 942
East Midlands	7 299	6 227	6 614
East Anglia	2 904	7 348	8 580
South East (UK)	44 035	35 246	34 762
South West (UK)	6 914	8 484	8 234
West Midlands	8 838	6 693	7 083
North West (UK)	6 910	8 205	7 602
Wales	1 417	1 320	1 284
Scotland	2 687	3 426	3 932
Northern Ireland	523	718	849

Notes

a No data available for public enterprises; data for 1994 and 1995 are provisional

b Break in series because of unification

c Data for Corsica a statistical secret; overseas departments not surveyed for the business enterprise sector

d Not including R&D personnel in the National Health Service and local authorities

Source: Eurostat, data in italics are from OECD

Table A.3.8: Government Scientists and Engineers

FTE	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
		91 000	106 900	119 800	116 700	116 200	115 500	116 200	
B b	619	686	..	783	..	..	1 007	1 014	(i)
DK	1 648	2 091	2 509	2 573	2 791	2 948	..	..	(i, ii)
D cd	..	20 425	..	38 614	34 800	33 743	..	..	(i, ii)
DD e	..	12 657	..	..	..	..	..	..	(iv)
EL	..	..	..	1 918	..	1 905	..	2 012	(i, ii)
E	3 536	2 839	7 623	8 078	7 661	7 738	7 820	..	(i, ii)
F	..	21 215	24 922	25 949	25 499	25 720	26 403	..	(ii)
IRL	..	618	395	353	315	352	388	..	(ii)
I	8 171	11 348	14 502	12 654	13 117	13 298	13 587	..	(i, ii)
L	..	..	..	..	..	..	..	..
NL	..	5 670	..	..	..	7 260	7 650	..	(i, ii)
A	..	518	..	..	..	904	..	..	(i)
P	836	..	1 094	..	1 074	..	..	2 741	(i)
FIN d	..	..	..	3 417	..	3 935	..	3 914	(i, ii)
S e	..	1 448	..	1 714	..	2 307	..	..	(i, ii)
UK f	19 300	19 000	15 061	15 027	15 051	14 037	14 032	13 673	(i, ii)
European Free Trade Association (EFTA)									
		2 400	2 800	3 300	3 500	3 600	3 800	3 900	4 200
IS	..	199	293	290	286	320	330	340	(ii)
NO d	1 516	1 729	..	2 582	..	2 885	..	..	(ii)
CH	..	..	550	..	630	..	550	..	(ii)
Central European Free Trade Association (CEFTA)									
		26 869	29 260	..	..	..	..	23 453	22 742
CZ	..	..	..	..	8 329	4 656	4 966	4 315	(ii)
SK	..	..	..	..	..	..	3 903	3 654	(iii, iv)
CS gh	10 528	13 197	..	..	..	..	..	..	(iii)
HU gh	5 641	4 963	4 717	4 204	3 833	3 769	3 833	3 529	(ii, iii)
PL i	10 700	11 100	..	7 100	7 120	..	10 751	11 244	(iii, ii)
Other European Countries									
		..	..	..	..	..	..	..	193 635
BG	8 245	..	..	14 751	12 560	..	..	7 220	(iii)
RO	..	..	..	7 785	7 605	7 338	6 200	5 941	(iii, iv)
RU j	..	..	107 500	109 000	109 000	102 800	143 685	146 342	(iv)
UA	..	..	..	..	..	..	..	32 273	(iii)
SU	..	..	370 200	..	..	..	..	..	(iii)
TR	..	..	1 637	1 900	1 988	1 774	1 756	1 859	(ii)
North American Free Trade Association (NAFTA) k									
		66 100	59 670	66 400	66 220	69 640	73 257	76 200	78 000
CA	7 500	7 570	7 850	7 920	7 840	7 850	..	..	(ii)
MX	..	..	..	..	..	5 407	5 446	6 015	(ii)
US	58 600	52 100	..	58 300	61 800	60 000	..	..	(ii)
South American Countries									
	
AR	2 600	..	..	..	..	..	..	5 847	(iii)
BR	..	..	..	..	..	..	..	..
CL	..	..	..	..	..	..	..	..
VE ij	1 405	..	..	..	..	..	..	..	(iii)
Developed Asian Economies									
	
JP	28 792	28 890	29 516	29 603	29 894	29 907	30 263	30 346	(ii)
KR eij	4 598	7 542	10 434	10 529	14 434	16 068	15 465	16 007	(iv)
SG ej	..	..	895	1 052	1 297	1 519	1 733	1 905	(iii, iv)
TW j	..	..	..	..	..	10 761	11 036	12 084	(iv)

Table A.3.8: Government Scientists and Engineers

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									

ID <i>j</i>	5 435	..	..	..	16 237	(iv, iii)
MY <i>e</i>	720	..	768	..	(iii, iv)
PH <i>j</i>	4 200	..	..	..	..	..	..	..	(iii)
TH <i>j</i>	4 184	..	..	..	5 260	(iii)
China and Hong Kong									

CN	415 441	406 981	194 500	..	186 900	(iii)
HK
Other Asian Countries									
	..	57 300	..	..	..	..	..	..	..
PK /
IN	74 570	..	58 304	..	77 113	..	(iii, iv)
Oceania									
	10 807	11 000	11 166	10 800	10 400	..	..
AU	..	7 030	9 281	..	9 609	..	8 680	..	(ii)
NZ	1 526	1 525	1 556	1 667	..	..	(ii)
Other Countries									

IL
ZA <i>m</i>	2 723	..	6 226	..	..	(iii)
Mediterranean Countries									

AL
CY	107	118	..	..	..	(iii, iv)
DZ
EG
IL
LB
MA
MT
SY
TN	542	..	..	..	(iii)
TR	1 637	1 900	1 988	1 774	1 756	1 859	(ii)

Notes

- a* Not including Luxembourg
b Data for 1994 and 1995 are provisional
c Break in series between 1990 and 1991 because of unification
d PNP sector included
e Excluding social sciences and humanities (Sweden until 1991)
f Not including R&D personnel in the National Health Service and local authorities
g Of military R&D, only that part carried out in civil establishments is included (Hungary since 1985)
h Not including personnel engaged in the administration of R&D
i Excluding military and defence R&D
j Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE
k Not including Mexico before 1993
l Included with business enterprise sector
m Mainly government financed research establishments

Source: (i) Eurostat (iii) UNESCO
(ii) OECD (iv) national source

Table A.3.9: Higher Education Scientists and Engineers

	1980	1985	1990	1991	1992	1993	1994	1995	Source
European Union (EU) a									
	..	172 400	211 600	243 600	258 400	269 300	288 400	298 000	
B b	6 568	6 650		8 405	..	..	9 832	9 839	(i, ii)
DK	2 505	2 997	4 045	4 139	4 383	4 627	..	..	(i, ii)
D c	..	33 448	..	62 171	64 880	67 140	..	..	(i)
DD d	..	7 308	..	..	..	..	..	..	(iv)
EL	..	..	..	3 119	..	4 773	..	6 067	(i, ii)
E	11 793	13 762	18 904	20 775	22 168	24 006	28 592	..	(i, ii)
F	..	35 666	39 883	42 146	48 151	49 868	52 119	..	(ii)
IRL	..	1 029	2 315	2 482	2 722	3 290	3 858	..	(i, ii)
I	20 875	27 949	31 844	33 007	32 826	33 204	33 907	..	(i, ii)
L	..	..	..	..	..	..	..	..
NL	..	7 600	12 310	12 460	12 630	12 710	12 920	..	(i, ii)
A	..	3 474	..	..	..	4 857	..	..	(i)
P	1 380	..	3 755	..	5 167	..	..	5 297	(i, ii)
FIN	..	..	..	5 508	..	6 173	..	6 566	(i)
S	..	8 200	..	11 447	..	12 688	..	12 517	(i, ii)
UK e	..	25 000	27 845	29 199	30 644	32 190	41 876	..	(i)
European Free Trade Association (EFTA)									
	..	8 800	10 900	11 600	12 500	12 700	12 700	14 300	
IS	..	174	182	215	225	205	211	217	(ii)
NO	2 871	3 167	..	4 154	..	4 737	..	..	(ii)
CH	..	..	..	..	7 800	..	7 800	..	(ii)
Central European Free Trade Association (CEFTA)									
	24 927	25 560	..	..	..	..	36 071	38 071	
CZ	..	..	..	..	1 190	1 388	1 731	2 685	(ii)
SK	..	..	..	..	..	..	3 698	3 954	(iii, iv)
CS f	2 872	3 182	..	..	..	..	..	..	(iii)
HU fg	4 955	4 678	5 204	4 926	4 754	4 546	4 589	4 044	(ii, iii)
PL h	17 100	17 700	..	15 400	15 210	..	26 053	27 388	(iii, ii)
Other European Countries									
	..	..	..	..	..	..	..	79 744	
BG	10 882	..	..	16 057	15 919	..	..	4 905	(iii)
RO	..	..	..	904	1 056	1 409	1 220	1 804	(iii, iv)
RU i	..	..	71 100	60 800	52 100	40 000	38 190	35 508	(iv)
UA	..	..	..	..	..	..	..	25 743	
SU i	..	..	198 300	..	..	..	..	..	(iii)
TR	..	..	8 420	8 768	9 089	10 218	10 712	11 784	(ii)
North American Free Trade Association (NAFTA) j									
	113 710	118 370	148 700	147 120	153 900	168 308	176 400	183 100	
CA	17 810	23 170	28 620	30 020	31 490	32 580	..	..	(ii)
MX	..	..	..	..	..	7 728	9 735	11 232	(ii)
US k	95 900	95 200	..	117 100	..	128 000	..	..	(ii)
South American Countries									
	
AR	5 200	..	..	..	..	..	..	13 441	(iii)
BR	..	..	..	..	..	..	..	..
CL	..	..	..	..	..	..	..	..
VE hi	2 240	..	..	..	..	..	..	..	(iii)
Developed Asian Economies									
	
JP l	80 432	92 535	104 949	107 231	111 003	114 582	117 851	121 431	(ii)
KR dhi	8 695	14 935	21 332	20 680	23 256	28 618	42 700	44 883	(iv)
SG di	..	..	2 071	1 872	1 970	1 987	2 045	2 602	(iv)
TW i	..	..	..	..	..	12 303	12 728	14 020	(iv)

Table A.3.9: Higher Education Scientists and Engineers

FTE (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	Source
Association of South-East Asian Nations (ASEAN-4)									
	
ID <i>i</i>	7 775	..	..	..	..	(iv)
MY <i>d</i>	519	..	383	..	(iv)
PH	
TH <i>i</i>	4 949	..	..	..	1 312	(iv, iii)
China and Hong Kong									
	132 574	
CN	631 324	555 712	131 400	..	132 000	(iii)
HK	574	(iii)
Other Asian Countries									
	
PK <i>dh</i>	1 166	..	..	..	..	..	(iii)
IN	22 100	..	(iii)
Oceania									
	22 538	25 900	30 939	33 000	35 300	..	
AU	..	15 063	20 666	..	27 914	..	32 272	..	(ii)
NZ	1 872	1 872	3 026	3 026	..	..	(ii)
Other Countries									
	
IL	
ZA <i>m</i>	5 984	..	19 832	..	..	(iii)
Mediterranean Countries									
	
AL	
CY	
DZ	
EG	
IL	
LB <i>n</i>	180	..	..	..	..	..	..	..	(iii)
MA	
MT	..	34	..	..	..	..	..	..	(iii)
SY	
TN	2 718	..	..	..	(iii)
TR	8 420	8 768	9 089	10 218	10 712	11 784	(ii)

Notes*a* Not including Luxembourg*b* Data for 1994 and 1995 are provisional*c* Break in series between 1990 and 1991 because of unification*d* Excluding social sciences and humanities*e* Not including R&D personnel in the National Health Service and local authorities*f* Of military R&D, only that part carried out in civil establishments is included (Hungary since 1985)*g* Not including personnel engaged in the administration of R&D*h* Excluding military and defence R&D*i* Data indicate the number of full-time plus part-time personnel or head-count, instead of FTE*j* Not including Mexico before 1993*k* Excluding humanities*l* Adjusted series calculated by the OECD Secretariat*m* Mainly government financed research establishments*n* Data refer only to the Faculty of Science at the University of Lebanon

Source: (i) Eurostat (iii) UNESCO
(ii) OECD (iv) national source

Table A.4.1: Number of Graduates of Higher Education

	1985-86		1990-91		1991-92		1992-93		1993-94		Source
	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
European Union (EU) a	1 302 396	47.4	1 617 935	50.3	1 663 400	50.7	1 730 300	51.1	1 852 800	52.0	
B	48 626	46.9	53 900	53.7	..	..	59 894	51.2	..	..	(iii,i)
DK	22 659	49.7	22 500	52.2	22 840	53.7	30 274	50.4	32 448	51.8	(ii,i,ii,i)
D b	232 194	46.5	256 700	42.8	..	..	309 367	44.5	314 200	44.5	(ii,i)
DD	125 426	54.2	..	..	..	..	..	..	..	..	(iii)
EL	27 309	55.2	28 500	51.7	..	..	26 600	56.8	27 135	56.3	(iii,i)
E	99 969	54.1	131 500	56.1	138 889	56.4	150 155	55.1	162 476	56.5	(ii,i)
F	312 096	49.1	456 535	..	..	..	389 820	53.8	..	..	(iii,ii)
IRL c	14 722	..	22 700	47.8	..	..	27 899	48.8	29 677	49.0	(ii,i)
I	93 481	45.3	106 000	44.3	112 092	50.5	120 886	52.4	199 055	56.4	(ii,i)
L	..	..	..	..	..	..	..	..	..	..
NL	62 786	43.7	68 900	43.5	71 180	46.6	73 645	47.1	77 951	48.4	(ii,i)
A	13 981	50.5	16 700	47.1	17 270	49.9	..	..	18 687	50.5	(ii,i)
P c	13 510	57.7	18 300	..	..	..	23 981	..	33 913	63.0	(ii,i)
FIN	22 243	52.4	26 200	57.7	..	..	28 502	58.5	31 648	57.6	(ii,i,ii,i)
S	41 036	54.2	37 700	57.9	..	..	34 838	61.6	34 689	61.4	(iii,ii,i)
UK	297 784	45.0	371 800	49.2	400 459	48.5	436 457	50.4	471 575	51.2	(iii,i,ii,i)
European Free Trade Association (EFTA)	40 500	50.6	66 900	50.9	81 200	43.9	87 100	46.0	92 107	46.5	
IS d	..	..	..	..	..	..	..	..	1 126	62.2	(ii)
NO	29 174	56.7	53 577	54.3	46 592	53.3	48 854	54.5	50 933	55.0	(ii)
CH e	10 380	32.3	12 337	35.3	33 602	30.4	37 100	34.3	40 048	35.2	(ii)
Central European Free Trade Association (CEFTA)	169 600	56.7	161 583	..	..	..	199 833	58.8	..	..
CZ	..	..	..	..	23 154	50.4	29 134	51.2	27 840	54.4	(ii)
SK	..	..	..	..	..	..	10 667	48.6	11 243	49.4	(iii)
CS	33 568	44.6	29 379	43.5	..	..	..	..	..	..	(iii)
HU	25 137	57.3	24 103	..	24 811	52.4	25 665	53.5	23 615	54.9	(iii,ii,iii)
PL	110 895	60.2	108 101	62.7	..	..	134 367	62.3	..	..	(iii,ii)
Other European Countries	..	..	1 421 800	..	1 388 600	..	1 359 399	..	1 314 300	..	
BG	20 374	56.4	30 038	38.2	31 361	57.7	30 690	59.6	31 667	60.6	(iii)
RO	..	..	..	..	29 901	48.1	33 366	..	34 420	50.0	(iv)
RU f	..	..	..	..	..	..	1 037 714	..	989 692	58.4	(iii)
UA g	..	..	140 218	..	..	..	153 500	..	149 000	..	(iii)
SU dg	839 500	..	779 792	..	..	..	..	..	..	..	(iii)
TR	61 098	34.8	91 317	35.0	94 714	35.5	104 129	38.8	..	..	(ii)
North American Free Trade Association (NAFTA)	2 435 273	50.2	2 743 400	53.5	2 767 400	53.6	3 658 989	52.8	3 744 511	53.0	
CA	492 223	47.3	592 810	51.6	613 416	51.2	1 110 079	48.8	1 131 693	48.7	(ii)
MX	113 050	..	..	..	..	..	164 091	..	170 824	..	(ii,ii)
US	1 830 000	51.0	1 999 953	54.1	1 996 602	54.3	2 384 819	54.7	2 441 994	55.0	(ii)
South American Countries	..	..	..	..	..	..	..	..	..	..
AR	..	..	..	..	..	..	..	..	..	..
BR hi	228 074	..	230 271	59.7	..	..	..	..	240 269	60.1	(iii)
CL hk	24 164	51.4	..	..	14 900	..	..	..	15 414	..	(iii)
VE	29 406	..	..	..	..	..	..	..	..	..	(iii)
Developed Asian Countries i	1 079 794	45.6	1 386 235	47.2	1 310 800	48.0	1 546 406	48.3	1 630 159	49.3	
JP	771 957	47.8	963 358	49.5	1 010 490	49.9	1 055 913	49.9	1 090 376	50.9	(ii)
KR	210 548	37.6	293 684	39.7	..	..	333 640	43.2	366 934	44.6	(ii,iii)
SG	..	..	..	..	..	..	..	..	..	..
TW	97 289	42.7	129 193	46.2	144 354	48.2	156 853	49.3	172 849	49.2	(iv)

Table A.4.1: Number of Graduates of Higher Education

(continued)

	1985-86		1990-91		1991-92		1992-93		1993-94		Source
	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
Association of South-East Asian Nations (ASEAN-4)											
	
ID <i>c</i>	73 627	33.8	..	..	149 401	..	177 735	40.1	..	..	(iii)
MY <i>k</i>	24 853	47.6	20 886	46.3	..	..	..	..	..	..	(ii)
PH	..	..	..	..	249 121	66.5	..	..	..	..	(iii)
TH <i>c</i>	191 811	..	..	..	..	..	209 162	55.1	..	..	(iii)
China and Hong Kong											
	350 317	..	665 000	..	655 600	..	649 377	..	1 064 700	..	
CN	330 313	..	645 510	..	..	..	627 571	..	1 040 135	..	(iii)
HK <i>c</i>	20 004	36.5	..	..	19 047	40.3	21 806	42.4	..	..	(ii)
Other Asian Countries											
	
PK	..	..	..	..	..	..	..	..	..	..
IN	..	..	1 213 387	..	..	..	..	..	..	..	(iii)
Oceania											
	86 726	49.7	156 500	54.9	158 656	55.0	146 800	56.8	148 900	56.9	
AU <i>cd</i>	73 563	50.2	..	..	120 584	57.1	..	..	124 927	57.2	(iii,ii)
NZ	13163	46.7	..	..	38 072	48.4	24 001	55.5	..	..	(ii)
Other Countries											
	
IL <i>j</i>	12 050	48.4	..	..	..	..	15 573	52.9	16 139	..	(iii)
ZA	..	..	..	..	..	..	..	..	..	..
Mediterranean Countries											
	249 100	..	329 600	..	331 100	..	337 800	..	345 400	..	
AL <i>m</i>	3 623	44.9	4 647	..	4 379	57.8	4 425	54.7	3 972	53.1	(iii,iv)
CY	1 289	58.4	2 627	..	2 209	52.6	2 313	58.0	1 975	..	(iii,iv)
DZ	..	..	40 306	36.4	40 123	..	40 078	42.3	39 891	..	(iv)
EG <i>jn</i>	116 854	35.9	..	..	111 499	37.9	110 737	38.7	..	..	(iii)
IL <i>j</i>	12 050	48.4	..	..	..	..	15 573	52.9	16 139	..	(iii,iv)
LB <i>c</i>	6 005	39.8	..	..	..	..	..	..	..	..	(ii)
MA <i>j</i>	9 429	32.6	21 907	33.6	23 709	..	25 034	..	26 700	39.1	(iii,iv)
MT	216	22.7	405	43.7	794	..	805	48.9	942	..	(iii,iv)
SY <i>op</i>	19 384	36.3	28 770	42.6	..	..	18 686	41.0	18 569	..	(iii,iv)
TN	4 473	34.1	6 915	39.7	8 922	..	10 064	42.7	11 654	42.0	(iii,iv)
TR	61098	34.8	91 317	35.0	94 714	35.5	104 129	38.8	..	..	(ii)

Notes*a* Excluding Luxembourg*b* Data before 1991-92 refer to the Federal Republic of Germany prior to 3.10.1990*c* Data are for 1984-85 instead of 1985-86*d* Data are only for ISCED 6 and 7 (Australia only 1993-94)*e* Change in classification between ISCED 3 and ISCED 5 after 1990-91*f* Data for 1993-94 do not include post-graduates*g* The figures have been provided by the authorities according to their own system of classification*h* Data are for 1986-87 instead of 1985-86*i* Excluding post-graduates*j* Universities and equivalent degree granting institutions only*k* Data for 1990-91 do not include polytechnics and teacher training*l* Not including Singapore*m* Data for 1985-86 and 1991-92 do not include distance learning institutions*n* Excluding Al Azhar University*o* Data for 1992-93 do not include teacher training and technical education*p* Data for 1985-86 do not include teacher training colleges

Source: (i) Eurostat (iii) UNESCO
(ii) OECD (iv) national source

Table A.4.2: Number of Graduates of Higher Education by Field of Study

Latest available year

		Total		Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities		Other fields		Source
		total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
European Union (EU)																		
92-93	B	59 894	51.2	3 447	30.5	10 481	19.1	7 791	68.2	1 590	33.9	22 254	54.2	3 268	61.8	11 063	69.3	(i)
93-94	DK	32 448	51.8	3 973	67.0	4 851	22.5	4 092	46.1	880	29.7	9 844	43.2	3 780	71.6	5 028	78.7	(i)
93-94	D	314 200	44.5	28 000	30.5	79 700	11.2	58 600	64.5	11 600	28.9	70 900	46.2	24 000	63.5	41 400	79.9	(i)
92-93	EL	26 581	56.6	2 331	41.1	3 612	25.2	4 332	60.0	1 022	40.0	5 026	55.7	1 102	56.4	9 156	73.9	(i)
93-94	E	162 476	56.5	14 700	41.9	18 779	20.9	18 615	69.8	1 799	51.5	64 681	57.7	16 524	62.2	27 378	73.8	(i)
92-93	F	389 820	53.8	68 416	38.7	54 264	17.6	10 042	52.2	./.	./.	141 828	63.3	61 663	72.6	53 607	62.9	(ii)
93-94	IRL	29 677	49.0	5 996	46.1	5 267	13.1	1 054	59.4	465	36.1	13 197	59.3	1 472	64.7	2 226	68.6	(i)
93-94	I a	120 165	52.2	10 948	52.6	14 472	23.8	28 412	47.1	3 115	35.2	43 100	51.1	16 881	83.8	3 237	87.7	(i)
	L	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
92-93	NL	73 618	47.1	4 210	23.7	10 324	14.6	9 983	66.0	2 362	23.4	28 256	48.2	6 094	61.7	12 389	62.1	(i)
93-94	A	18 687	50.5	1 653	27.7	2 583	19.7	1 789	61.7	709	40.2	5 507	46.8	2 528	59.8	3 918	76.5	(i)
93-94	P	33 913	63.0	1 503	55.2	4 530	26.4	3 142	80.7	1 158	51.6	12 010	61.2	3 340	70.0	8 230	79.3	(i)
93-94	FIN	31 648	57.6	2 794	31.0	6 331	14.3	10 041	87.2	1 354	32.2	3 814	62.8	1 805	69.0	5 509	66.0	(i)
93-94	S	34 689	61.4	2 478	32.4	5 448	18.6	8 582	80.8	538	29.6	7 430	58.4	1 638	58.9	8 575	82.6	(i)
93-94	UK	471 574	51.2	37 581	43.2	71 302	20.1	64 721	81.6	28 941	30.1	166 076	50.5	53 413	62.9	49 542	64.4	(ii)
European Free Trade Association (EFTA)																		
93-94	IS a	1 126	62.2	122	36.1	62	11.3	224	77.2	9	-	291	55.0	152	63.8	266	82.3	(ii)
93-94	NO	50 933	55.0	1 613	44.0	4 818	17.7	3 976	82.3	521	39.0	19 727	51.8	10 749	64.1	9 529	61.7	(ii)
93-94	CH a	12 947	35.1	2 232	23.4	1 505	15.0	1 905	41.2	309	32.4	5 063	37.3	1 685	53.4	248	52.4	(ii)
Central European Free Trade Association (CEFTA)																		
93-94	CZ	27 840	54.4	948	36.6	6 240	25.4	2 212	66.8	3 222	64.6	8 953	60.8	924	36.0	5 341	72.6	(ii)
93-94	SK	11 243	49.4	390	52.8	4 281	28.9	811	64.9	1 089	38.5	2 076	64.5	415	50.8	2 181	74.0	(iii)
90-91	CS	29 379	43.5	812	39.3	11 680	23.0	2 078	62.4	3 062	33.9	5 012	56.9	869	42.3	5 866	71.8	(iii)
93-94	HU	23 615	54.9	522	34.5	4 190	18.8	1 845	62.2	1 070	32.4	3 745	58.7	1 175	56.1	11 068	69.1	(iii)
92-93	PL	134 367	62.3	3 830	65.7	19 535	24.8	33 376	71.4	5 665	37.8	31 560	63.2	10 783	73.5	29 618	75.8	(ii)
Other European Countries																		
93-94	BG	31 667	60.6	1 017	70.0	8 406	49.9	6 057	79.3	1 056	41.0	4 997	57.6	1 664	75.3	8 470	58.1	(iii)
93-94	RO	34 240	50.2	2 336	67.0	17 963	39.6	3 260	60.0	1 564	51.0	5 007	70.6	3 125	60.9	985	33.1	(iv)
93-94	RU b	989 692	58.4	61 152	55.6	348 457	29.0	131 898	84.4	58 119	46.1	182 924	76.2	55 251	75.6	151 891	81.5	(iii)
90-91	UA c	140 218	..	..	..	52 314	..	9 199	..	15 199	..	14 436	..	20 949	..	28 121	..	(iii)
90-91	SU	779 792	..	..	..	286 022	..	54 240	..	73 725	..	70 654	..	129 729	..	165 422	..	(iii)
92-93	TR	104 129	38.8	6 810	47.3	22 266	19.3	16 347	58.9	4 811	32.5	28 575	40.8	5 987	52.1	19 333	35.8	(ii)
North American Free Trade Association (NAFTA)																		
93-94	CA a	147 376	55.4	15 023	39.0	10 972	15.7	9 577	69.7	1 298	48.1	55 263	54.1	22 059	62.4	33 184	69.7	(ii)
93-94	MX a	152 316	..	19 097	..	24 841	..	14 639	..	5 838	..	76 324	..	4 532	..	7 045	..	(iii)
93-94	US	2 441 994	55.0	165 595	41.2	255 024	14.0	297 010	77.6	23 396	36.5	888 899	55.3	400 978	59.3	411 092	65.7	(ii)
South American Countries																		
	AR	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
93-94	BR b	240 269	60.1	14 669	48.8	20 023	25.5	24 271	65.5	5 159	30.5	100 031	53.7	23 616	76.6	52 500	81.6	(iii)
93-94	CL d	15 414	..	830	..	4 087	..	2 166	..	787	..	3 230	..	709	..	3 605	..	(iii)
88-89	VE	32 787	..	1 522	..	6 919	..	3 787	..	1 521	..	13 089	..	324	..	5 625	..	(iii)
Developed Asian Economies																		
93-94	JP	1 090 376	50.9	20 631	18.9	217 981	11.5	85 218	71.2	21 697	26.0	382 865	49.2	201 478	78.2	160 506	71.1	(ii)
93-94	KR	366 934	44.6	23 034	44.7	87 046	14.4	25 391	60.3	14 991	35.6	106 040	47.0	65 693	66.5	44 739	59.3	(ii)
	SG	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
92-93	TW	156 853	49.3	10 914	39.6	59 149	20.3	13 624	72.8	4 892	40.4	47 425	72.9	11 179	80.0	9 670	57.5	(iv)
Association of South-East Asian Nations (ASEAN-4)																		
92-93	ID	177 735	40.1	3 065	39.0	23 314	13.0	3 360	57.8	12 580	36.5	85 108	42.0	5 105	56.3	45 193	48.2	(iii)
90-91	MY	20 886	46.3	2 492	46.9	3 385	17.5	546	52.9	813	28.3	8 884	52.0	2 005	57.4	2 761	58.9	(iii)
91-92	PH	249 121	66.5	9 097	70.2	40 542	16.7	41 485	85.6	7 356	45.8	77 856	76.6	20 830	62.1	51 955	78.7	(iii)
92-93	TH	209 162	55.1	12 129	43.2	31 819	5.6	12 233	78.5	6 437	30.8	78 451	67.8	35 995	69.0	32 098	57.7	(iii)

Table A.4.2: Number of Graduates of Higher Education by Field of Study

Latest available year (continued)

		Total		Natural sciences		Engineering and technology		Medical sciences		Agricultural sciences		Social sciences		Humanities		Other fields		Source
		total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
China and Hong Kong																		
93-94	CN	1 040 135	..	48 081	..	279 907	..	66 550	..	36 389	..	230 303	..	78 569	..	300 336	..	(iii)
92-93	HK	21 806	42.4	2 918	26.6	5 849	12.2	995	52.7	-	-	7 211	56.1	1 976	71.8	2 857	59.1	(iii)
Other Asian Countries																		
90-91	IN	1 213 387	..	164 414	..	33 509	..	21 992	..	13 406	..	277 520	..	586 714	..	115 832	..	(iii)
	PK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Oceania																		
93-94	AU <i>a</i>	124 927	57.2	15 613	40.6	9 323	20.3	17 044	78.9	2 346	39.4	36 648	48.4	18 357	67.2	25 596	73.1	(ii)
92-93	NZ	24 001	55.5	2 132	39.5	1 631	20.3	2 437	76.0	571	41.3	8 507	47.7	4 144	62.8	4 579	74.1	(ii)
Other Countries																		
92-93	IL <i>d</i>	15 573	52.9	2 350	49.7	2 038	16.7	1 510	60.8	308	46.1	5 452	51.6	..	..	3 915	73.1	(iii)
	ZA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mediterranean Countries																		
93-94	AL	3 972	53.1	943	37.1	451	32.9	445	45.8	655	46.8	945	64.4	437	61.4	96	64.7	(iv)
93-94	CY	1 975	58.0	170	38.8	205	6.8	130	87.7	17	..	975	59.3	149	61.0	629	70.9	(iv)
93-94	DZ <i>e</i>	31 350	42.3	4 566	58.8	11 663	25.4	1 541	49.4	588	38.3	10 009	42.0	2 983	55.9	1 231	44.2	(iv)
92-93	EG <i>df</i>	110 737	38.7	5 128	33.8	7 258	15.2	10 346	43.5	6 778	34.3	38 613	31.5	18 731	49.0	23 883	49.5	(iii)
92-93	IL <i>d</i>	15 573	52.9	2 350	49.7	2 038	16.7	1 510	60.8	308	46.1	5 452	51.6	..	..	3 915	73.1	(iii)
	LB	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
93-94	MA <i>d</i>	26 700	39.1	6 586	33.2	1 870	26.1	901	36.2	-	-	8 541	36.6	8 802	47.1	-	-	(iv)
93-94	MT	942	48.9	44	34.9	69	15.9	158	42.7	-	-	309	39.4	174	67.0	188	63.2	(iv)
92-93	SY <i>g</i>	18 686	41.0	1 400	49.0	4 353	28.6	3 573	42.2	963	33.1	4 644	34.4	2 770	65.3	983	50.5	(iii)
93-94	TN	11 654	42.0	1 071	33.8	1 396	13.2	1 255	59.1	205	24.9	3 681	42.0	2 815	52.5	1 231	49.9	(iv)
92-93	TR	104 129	38.8	6 810	47.3	22 266	19.3	16 347	58.9	4 811	32.5	28 575	40.8	5 987	52.1	19 333	35.8	(ii)

Notes*a* Data are only for ISCED 6 and 7*b* Excluding post-graduates*c* The figures have been provided by the authorities of the Ukraine according to their own classification system*d* Universities and equivalent degree granting institutions only*e* Only graduates from MESR*f* Excluding Al Azhar University*g* Data do not include teacher training and technical education(i)Eurostat**Source: (ii) OECD****(iii) UNESCO****(iv) national source**

Table A.4.3: Number of PhD Graduates

	1992-93		1993-94		Source
	total	% fem.	total	% fem.	
European Union (EU)					
B	854	27.3	..	..	(i)
DK	320	26.6	333	35.1	(i)
D	21 438	28.9	21 032	30.6	(i)
EL	532	29.5	536	29.9	(i)
E a	5 193	39.0	..	..	(i)
F	8 787	..	9 896	..	(i)
IRL	330	30.2	475	37.7	(i)
I	..	..	2 000	..	(i)
L	..	..	..	..
NL	4 477	33.0	..	..	(i)
A	..	..	1 581	28.9	(i)
P	..	..	..	..
FIN	1 672	37.7	1 882	40.5	(ii,i)
S	1 763	28.4	2 072	29.2	(i)
UK	8 947	29.2	9 130	29.6	(i)
European Free Trade Association (EFTA)					
IS	..	..	..	..
NO	463	24.8	500	25.2	(ii)
CH	3 348	29.7	3 509	29.7	(ii)
Central European Free Trade Association (CEFTA)					
CZ	80	31,3	118	19.5	(ii)
SK	..	..	..	..
HU	..	..	..	..
PL	..	..	..	..
Other European Countries					
BG	..	..	..	..
RO	..	..	..	..
RU	13 432	..	12 292	..	(iii)
UA	3 233	..	3 201	..	(iii)
TR	2 801	32.0	..	..	(ii)
North American Free Trade Association (NAFTA)					
CA	3 136	31.9	3 356	32.5	(ii)
MX	352	..	488	..	(iii)
US	42 132	38.1	43 185	38.5	(ii)
Developed Asian Economies					
JP	6 765	13.4	7 366	14.6	(ii)
KR	3 711	14.7	3 818	15.2	(ii)
SG	..	..	..	..
TW	708	15.5	..	..	(iii)
Oceania					
AU	..	..	1 848	32.3	(ii)
NZ	278	36.3	265	35.8	(iii)

Notes

a Figure overestimated, because all 2nd university qualifications, e.g. Masters, are included

Source: (i) Eurostat
(ii) OECD
(iii) national source

Table A.5.1: Number of Scientific Publications

	1980	1985	1990	1991	1992	1993	1994	1995
European Union (EU)	128 984	141 177	159 279	168 760	183 451	185 101	200 142	207 973
B	4 133	4 584	5 114	5 309	5 754	5 973	6 637	7 129
DK	3 944	4 142	4 525	4 617	5 146	5 205	5 768	5 846
D	27 546	29 526	32 585	37 891	41 065	40 156	43 987	45 903
EL	907	1 236	1 693	1 939	2 116	2 194	2 525	2 650
E	2 685	4 814	8 141	8 825	11 420	12 079	13 132	14 189
F	24 389	23 434	27 359	28 529	31 936	32 263	34 890	36 607
IRL	954	899	1 118	1 112	1 166	1 293	1 433	1 548
I	9 361	11 948	15 661	16 591	18 834	18 843	21 175	22 494
L	13	19	17	19	27	36	43	47
NL	6 993	9 027	11 543	11 618	12 806	13 288	14 163	14 846
A	2 779	2 767	3 286	3 411	3 802	3 878	4 126	4 585
P	230	350	775	833	983	1 065	1 234	1 359
FIN	2 801	3 018	3 510	3 696	4 105	4 302	4 725	5 054
S	7 108	8 473	9 479	9 596	10 057	10 298	11 002	11 586
UK	39 419	43 509	45 355	46 992	49 843	50 371	53 701	54 781
European Free Trade Association (EFTA)	8 863	9 407	10 516	10 907	12 162	12 503	13 542	13 939
IS	60	80	136	145	159	175	184	209
NO	2 520	2 602	2 764	2 761	3 150	3 082	3 360	3 546
CH	6 298	6 743	7 659	8 042	8 942	9 294	10 083	10 286
Central European Free Trade Association (CEFTA)	12 375	10 413	10 243	10 384	11 331	11 159	11 636	12 444
CZ	..	..	..	..	2 576	2 620	2 709	2 609
SK	..	..	..	..	1 256	1 277	1 353	1 370
CS	4 083	3 404	3 332	3 241	..	..	..	..
HU	2 944	2 390	2 169	2 371	2 477	2 378	2 432	2 582
PL	5 426	4 703	4 854	4 876	5 246	5 052	5 361	6 160
Other European Countries	39 933	36 199	36 217	35 114	34 072	28 479	31 012	30 311
BG	1 351	1 295	1 407	1 398	1 462	1 645	1 323	1 258
RO	838	680	434	460	673	671	889	899
RU	..	..	..	..	26 776	21 857	24 137	22 989
UA	..	..	..	..	4 695	3 331	3 426	3 469
SU	37 492	33 924	33 615	32 356	..	..	..	..
TR	352	441	884	1 034	1 251	1 434	1 721	2 143
North American Free Trade Association (NAFTA)	171 530	190 060	207 743	211 803	218 546	218 429	223 941	227 985
CA	18 316	21 268	24 164	24 601	26 303	26 174	26 964	27 229
MX	794	995	1 258	1 335	1 656	1 809	1 982	2 370
US	154 037	170 128	185 599	189 355	194 631	194 554	199 423	203 164
South American Countries	3 953	4 419	6 014	6 335	7 104	7 206	7 597	8 498
AR	1 071	1 439	1 873	1 787	1 853	1 964	2 152	2 406
BR	1 813	1 919	2 821	3 202	3 786	3 703	3 943	4 479
CL	616	744	1 030	1 040	1 076	1 137	1 082	1 212
VE	482	353	391	434	504	515	563	570
Developed Asian Economies	27 472	35 086	45 417	47 450	53 844	54 717	60 275	63 361
JP	26 773	33 335	41 275	42 632	47 555	47 301	51 111	52 599
KR	145	579	1 395	1 651	2 081	2 608	3 443	4 514
SG	121	374	610	640	817	979	1 168	1 339
TW	467	892	2 298	2 700	3 628	4 106	4 900	5 389

Table A.5.1: Number of Scientific Publications (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Association of South-East Asian Nations (ASEAN-4)								
	718	759	1 084	1 074	1 100	1 230	1 376	1 487
ID	81	116	170	141	147	184	200	262
MY	241	220	309	321	315	375	429	493
PH	152	142	223	198	210	206	204	233
TH	248	288	398	426	442	480	558	543
China and Hong Kong								
	1 146	3 589	7 174	7 253	8 239	8 949	9 238	10 807
CN	826	3 039	6 300	6 386	7 256	7 788	7 943	9 196
HK	321	560	914	917	1 052	1 260	1 406	1 826
Other Asian Countries								
	14 484	10 979	10 171	10 606	11 200	11 075	11 288	11 059
PK	194	177	307	383	345	431	405	427
IN	14 290	10 806	9 867	10 225	10 856	10 647	10 887	10 638
Oceania								
	12 199	12 727	14 012	14 207	15 105	15 709	16 864	17 542
AU	10 053	10 477	11 552	11 873	12 602	13 282	14 174	14 820
NZ	2 202	2 346	2 603	2 446	2 663	2 572	2 873	2 915
Other Countries								
	7 044	8 323	8 448	8 592	8 889	9 421	9 549	9 747
IL	4 685	5 616	5 678	5 650	6 154	6 659	6 819	7 045
ZA	2 369	2 733	2 794	2 963	2 763	2 798	2 780	2 729
Mediterranean Countries								
	6 676	7 717	8 612	9 052	9 834	10 419	11 173	11 955
AL	2	5	7	16	15	17	27	32
CY	17	19	19	13	47	46	42	72
DZ	78	111	156	159	202	192	209	246
EG	1 242	1 152	1 456	1 650	1 515	1 475	1 644	1 630
IL	4 685	5 616	5 678	5 650	6 154	6 659	6 819	7 045
LB	87	133	32	60	63	73	89	80
MA	93	115	170	249	328	304	338	434
MT	12	1	9	16	13	12	19	31
SY	6	22	47	46	68	70	77	70
TN	106	111	162	184	205	157	226	222
TR	352	441	884	1 034	1 251	1 434	1 721	2 143
All countries, excluding Mediterranean countries								
	414 322	440 976	482 501	492 984	519 368	514 858	541 211	554 442
All countries, including Mediterranean countries								
	415 611	442 163	483 884	494 560	520 833	516 289	542 799	556 048
World	448 054	469 498	508 941	516 288	545 685	539 713	567 523	579 069

Notes

A full counting scheme has been applied, that is, all countries indicated in the address field have been taken into account. Due to international co-authorship, publication counts can therefore not be summed up over addresses to the total.

Source: RASCI, Data: Science Citation Index

Table A.5.2: Number of Scientific Publications by Field of Science

	1980	1985	1990	1991	1992	1993	1994	1995
European Union (EU)								
Clinical medicine	33 709	37 328	41 515	42 493	46 981	46 390	50 117	51 218
Biomedical research	20 881	25 217	29 870	31 414	33 053	33 609	35 083	36 572
Biology	21 546	22 057	25 490	26 464	28 380	29 340	30 859	32 816
Chemistry	18 864	19 971	21 223	23 761	25 831	26 674	27 561	29 138
Physics	20 720	23 913	28 559	32 107	35 247	35 341	39 543	40 684
Mathematics	3 747	4 103	3 527	3 826	4 412	5 089	5 546	6 070
Engineering	17 728	20 074	24 965	27 278	30 111	31 048	34 147	36 217
Earth and space science	3 347	3 751	4 680	4 892	5 397	5 511	6 012	6 341
European Free Trade Association (EFTA)								
Clinical medicine	2 650	2 437	2 619	2 714	3 104	3 083	3 282	3 446
Biomedical research	1 479	1 821	2 058	2 120	2 180	2 344	2 424	2 532
Biology	1 367	1 466	1 720	1 721	1 900	1 968	2 141	2 250
Chemistry	1 039	1 151	1 164	1 278	1 402	1 521	1 644	1 655
Physics	1 590	1 832	2 147	2 202	2 621	2 534	2 775	2 939
Mathematics	201	199	224	172	208	265	320	312
Engineering	1 099	1 262	1 626	1 703	1 847	1 954	2 260	2 258
Earth and space science	254	283	432	465	498	584	567	612
Central European Free Trade Association (CEFTA)								
Clinical medicine	1 261	1 049	1 072	1 093	1 063	1 053	1 090	1 097
Biomedical research	1 542	1 156	1 081	1 002	1 243	1 048	1 083	1 152
Biology	2 884	1 874	1 539	1 512	1 720	1 652	1 635	1 598
Chemistry	3 779	3 200	3 003	3 164	3 224	3 364	3 425	3 682
Physics	2 334	2 410	3 038	3 049	3 375	3 358	3 804	4 230
Mathematics	351	497	352	425	469	426	476	526
Engineering	1 369	1 217	1 534	1 593	1 898	1 828	1 872	2 184
Earth and space science	180	144	180	225	210	251	252	262
Other European Countries								
Clinical medicine	2 741	3 201	3 108	3 514	2 357	1 534	2 564	1 417
Biomedical research	3 058	2 859	2 708	2 670	1 925	1 812	1 715	1 512
Biology	2 886	2 470	2 596	2 312	2 528	2 265	1 973	2 193
Chemistry	10 713	9 281	9 232	8 560	9 106	7 288	7 885	7 927
Physics	10 507	9 903	11 370	11 242	12 146	10 839	11 610	12 616
Mathematics	997	639	779	747	762	827	794	1 012
Engineering	6 308	5 331	5 187	5 556	5 043	4 688	4 876	4 684
Earth and space science	1 456	1 599	1 502	1 439	1 825	1 401	1 338	1 280
North American Free Trade Association (NAFTA)								
Clinical medicine	44 310	48 946	54 018	54 467	56 833	56 167	57 215	58 862
Biomedical research	28 757	32 557	34 851	36 161	36 491	37 758	38 854	39 843
Biology	33 994	35 112	37 274	38 043	38 829	38 146	38 385	39 101
Chemistry	16 412	18 889	21 028	21 985	22 826	23 144	23 115	23 475
Physics	24 937	32 343	34 254	36 110	37 111	36 767	37 907	37 956
Mathematics	6 317	6 167	5 732	5 887	6 026	6 518	6 638	6 705
Engineering	27 191	31 452	37 333	38 731	41 821	41 941	44 636	44 813
Earth and space science	7 524	8 316	9 164	9 068	8 980	9 558	9 833	10 177
South American Countries								
Clinical medicine	977	981	1 267	1 250	1 375	1 285	1 293	1 442
Biomedical research	484	668	1 065	1 058	1 147	1 147	1 227	1 310
Biology	865	808	1 110	1 222	1 322	1 460	1 582	1 674
Chemistry	413	625	812	791	945	1 040	1 068	1 256
Physics	712	1 029	1 382	1 625	1 862	1 845	2 045	2 191
Mathematics	110	155	193	207	217	250	291	421
Engineering	520	620	740	825	1 058	977	1 051	1 241
Earth and space science	109	112	202	214	200	242	228	286

Table A.5.2: Number of Scientific Publications by Field of Science (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Developed Asian Economies								
Clinical medicine	2 884	4 498	6 512	7 433	8 336	9 119	10 167	10 533
Biomedical research	4 722	6 566	8 080	8 779	10 006	9 812	10 338	10 588
Biology	4 847	5 422	6 623	7 173	7 801	8 062	8 470	8 934
Chemistry	6 890	8 260	10 016	10 169	10 932	10 857	11 958	12 243
Physics	5 883	7 433	10 673	10 633	13 544	13 076	14 539	15 999
Mathematics	583	800	561	706	739	894	1 031	1 065
Engineering	5 571	7 804	10 088	10 811	12 053	12 304	13 736	14 652
Earth and space science	388	549	715	680	743	795	933	1 101
Association of South-East Asian Nations (ASEAN-4)								
Clinical medicine	157	157	234	235	232	241	269	248
Biomedical research	84	106	182	179	212	209	265	255
Biology	289	308	493	461	483	511	554	615
Chemistry	49	103	95	105	119	151	156	184
Physics	44	70	67	91	102	109	123	187
Mathematics	16	18	14	5	10	18	10	9
Engineering	77	69	111	117	115	139	147	168
Earth and space science	61	51	110	68	66	68	103	96
China and Hong Kong								
Clinical medicine	218	478	1 003	814	896	935	915	1 029
Biomedical research	73	409	630	636	711	714	717	784
Biology	208	303	505	581	610	649	671	832
Chemistry	67	780	1 324	1 355	1 613	1 850	1 883	2 381
Physics	220	896	2 646	2 597	3 143	3 427	3 751	4 233
Mathematics	40	176	387	382	461	563	533	567
Engineering	124	455	1 176	1 293	1 608	1 802	1 733	2 019
Earth and space science	128	349	211	332	249	244	256	252
Other Asian Countries								
Clinical medicine	1 059	791	1 070	1 080	1 131	1 109	1 097	1 038
Biomedical research	1 139	922	944	1 045	1 066	1 100	1 077	1 074
Biology	4 029	2 285	1 844	1 853	1 990	1 908	1 804	1 788
Chemistry	3 828	2 981	2 824	2 881	2 997	2 955	3 068	3 013
Physics	2 858	2 751	2 745	3 005	3 194	3 003	3 126	3 164
Mathematics	511	412	194	211	248	292	307	309
Engineering	1 828	1 608	1 507	1 701	2 038	1 984	2 002	1 924
Earth and space science	535	419	326	372	371	416	376	377
Oceania								
Clinical medicine	2 668	3 181	3 777	4 010	4 197	4 389	4 594	4 695
Biomedical research	1 520	1 775	1 805	1 896	2 171	2 133	2 205	2 375
Biology	3 531	3 568	3 939	3 838	3 934	4 025	4 263	4 474
Chemistry	1 239	1 210	1 366	1 267	1 339	1 421	1 462	1 600
Physics	1 503	1 504	1 524	1 604	1 742	1 856	2 161	2 290
Mathematics	334	378	295	285	342	420	435	447
Engineering	1 289	1 504	1 623	1 835	1 989	2 094	2 409	2 530
Earth and space science	841	882	1 100	1 041	1 114	1 271	1 345	1 244
Other Countries								
Clinical medicine	2 077	2 638	2 495	2 422	2 521	2 495	2 479	2 488
Biomedical research	803	1 107	1 060	1 138	1 185	1 140	1 258	1 270
Biology	1 365	1 514	1 685	1 762	1 781	1 972	1 702	1 904
Chemistry	642	783	754	777	756	840	894	848
Physics	1 061	1 288	1 453	1 479	1 632	1 852	2 011	2 018
Mathematics	336	353	353	313	319	434	518	518
Engineering	970	1 204	1 206	1 262	1 412	1 600	1 558	1 632
Earth and space science	266	240	302	309	310	311	284	284

Table A.5.2: Number of Scientific Publications by Field of Science (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Mediterranean Countries								
Clinical medicine	1 441	1 827	2 057	2 071	2 363	2 486	2 583	2 753
Biomedical research	889	1 112	1 118	1 303	1 374	1 373	1 562	1 690
Biology	1 365	1 344	1 497	1 580	1 681	1 781	1 607	1 853
Chemistry	1 030	1 224	1 356	1 536	1 529	1 592	1 803	1 846
Physics	1 096	1 462	1 690	1 862	2 077	2 283	2 543	2 746
Mathematics	321	351	372	348	377	478	600	595
Engineering	969	1 200	1 425	1 536	1 700	1 839	1 999	2 184
Earth and space science	233	240	265	305	319	303	307	320
World								
Clinical medicine	100 085	109 127	120 199	122 390	129 378	127 325	134 678	136 197
Biomedical research	64 501	73 463	81 120	83 727	86 544	87 593	90 319	92 502
Biology	81 209	78 063	83 541	84 227	87 962	88 230	89 610	92 865
Chemistry	66 576	69 109	73 618	75 408	80 083	79 168	81 812	84 206
Physics	74 641	83 965	94 592	96 797	105 247	102 051	109 154	112 026
Mathematics	14 385	13 892	12 115	12 119	13 362	14 593	15 111	15 875
Engineering	70 348	75 518	86 340	90 790	98 164	98 589	105 777	107 261
Earth and space science	15 372	16 416	17 713	17 672	18 471	18 893	19 532	20 109

Source: RASCI, Data: Science Citation Index

Second European Report on S&T Indicators, 1997

Table A.5.3: Number of Citations

	1980	1985	1990	1991	1992	1993
European Union (EU)	393 048	450 534	585 797	622 686	692 054	749 079
B	13 132	15 821	20 232	21 145	24 591	27 171
DK	15 288	14 934	18 855	19 539	22 123	25 289
D	85 739	102 229	138 205	146 801	165 113	179 847
EL	1 599	2 244	4 021	3 832	5 046	5 143
E	5 034	10 091	22 462	24 420	32 975	37 539
F	66 058	74 212	102 169	112 057	124 543	134 101
IRL	1 708	2 033	3 489	3 360	4 459	3 930
I	24 587	31 131	50 691	56 993	66 124	70 677
L	13	19	5	44	57	65
NL	26 740	34 396	50 607	52 724	59 489	64 391
A	5 743	7 273	11 681	11 777	14 716	16 400
P	446	723	1 979	1 974	2 818	2 868
FIN	8 649	9 277	12 932	13 978	17 191	19 035
S	28 565	33 544	39 560	39 509	44 066	47 313
UK	133 574	149 028	184 107	187 239	210 869	224 990
European Free Trade Association (EFTA)	35 512	42 000	53 190	56 150	62 908	69 727
IS	138	187	460	422	744	975
NO	7 388	7 593	8 774	9 022	10 582	11 127
CH	28 052	34 373	44 437	47 097	52 381	58 047
Central European Free Trade Association (CEFTA)	17 153	14 906	19 174	20 873	24 615	25 755
CZ	..	..	..	..	5 444	5 591
SK	..	..	..	..	1 932	2 102
CS	5 109	4 054	5 540	5 428	..	..
HU	4 804	4 410	4 984	5 942	6 877	6 938
PL	7 407	6 582	8 807	9 763	10 740	11 893
Other European Countries	29 026	24 832	27 603	29 812	33 830	35 956
BG	1 004	1 194	1 832	1 643	2 033	1 992
RO	920	755	431	609	812	1 140
RU	..	..	..	..	27 799	28 857
UA	..	..	..	..	2 664	2 834
SU	26 757	22 580	24 781	26 564	..	..
TR	455	546	979	1 229	1 567	1 986
North American Free Trade Association (NAFTA)	704 230	796 651	1 018 333	1 067 960	1 118 362	1 177 612
CA	57 121	68 262	88 226	91 584	102 922	107 938
MX	2 077	2 136	2 629	2 657	3 846	4 077
US	653 069	737 796	949 483	996 149	1 039 906	1 094 845
South American Countries	6 625	7 167	10 936	12 912	15 050	16 446
AR	1 941	2 167	3 170	3 240	3 925	4 199
BR	2 839	3 106	5 367	6 650	7 708	8 421
CL	1 220	1 295	1 764	2 306	2 735	2 636
VE	668	713	921	1 001	1 006	1 494
Developed Asian Economies	74 040	92 209	143 662	151 510	173 208	178 570
JP	72 891	89 280	135 870	141 907	160 671	163 526
KR	333	959	2 546	3 102	4 074	5 840
SG	155	518	1 137	1 476	1 934	2 127
TW	787	1 630	4 531	5 564	7 220	8 274

Table A.5.3: Number of Citations (continued)

	1980	1985	1990	1991	1992	1993
Association of South-East Asian Nations (ASEAN-4)						
	1 116	1 196	2 190	2 127	2 360	2 677
ID	200	172	319	261	271	460
MY	305	247	501	471	484	510
PH	219	241	476	355	491	366
TH	397	558	926	1 058	1 146	1 368
China and Hong Kong						
	1 196	4 573	10 747	10 970	13 852	14 979
CN	590	3 451	9 003	9 230	11 440	12 277
HK	606	1 140	1 804	1 798	2 551	2 889
Other Asian Countries						
	13 639	10 713	12 379	13 416	15 235	14 937
IN	13 462	10 485	12 048	13 058	14 797	14 470
PK	177	242	337	363	439	469
Oceania						
	32 899	37 079	43 759	44 248	49 563	55 033
AU	28 532	31 846	36 945	38 391	42 481	47 442
NZ	4 539	5 559	7 319	6 295	7 682	8 316
Other Countries						
	18 564	21 876	23 188	26 237	27 599	29 932
IL	14 054	16 973	17 852	20 310	22 242	24 506
ZA	4 530	4 937	5 409	6 096	5 418	5 504
Mediterranean Countries						
	16 035	19 085	20 751	23 863	26 831	29 121
AL	0	1	7	25	12	33
CY	83	14	17	24	215	226
DZ	91	154	210	185	365	257
EG	1 016	952	1 251	1 480	1 629	1 507
IL	14 054	16 973	17 852	20 310	22 242	24 506
LB	97	168	43	99	50	103
MA	115	176	169	312	421	388
MT	20	0	9	17	12	14
SY	5	26	64	59	109	82
TN	103	97	178	224	287	264
TR	455	546	979	1 229	1 567	1 986
All countries, excluding Mediterranean countries						
	1 255 679	1 390 720	1 759 462	1 840 629	1 964 203	2 074 434
All countries, including Mediterranean countries						
	1 256 529	1 391 587	1 760 383	1 841 625	1 965 179	2 075 487
World	1 274 231	1 406 766	1 774 688	1 851 412	1 977 477	2 086 698

Notes

A full counting scheme has been applied, that is, all countries indicated in the address field have been taken into account. Due to international co-authorship, publication counts can therefore not be summed up over addresses to the total.

Source: RASCI, Data: Science Citation Index

Table A.5.4: Number of Citations by Field of Science

	1980	1985	1990	1991	1992	1993
European Union (EU)						
Clinical medicine	85 697	102 156	128 459	133 682	148 480	158 327
Biomedical research	78 223	93 561	129 547	138 145	147 838	160 850
Biology	62 955	64 979	84 776	92 989	101 777	111 072
Chemistry	54 969	56 827	63 361	70 261	77 149	85 970
Physics	73 494	86 957	113 105	123 957	140 549	144 857
Mathematics	4 160	4 052	4 403	4 814	5 414	7 909
Engineering	65 961	83 972	118 925	127 076	147 499	155 394
Earth and space science	8 153	9 617	12 510	12 359	14 765	16 844
European Free Trade Association (EFTA)						
Clinical medicine	6 721	8 058	9 661	10 237	11 629	11 676
Biomedical research	7 619	9 291	13 323	14 018	14 100	16 438
Biology	5 503	5 485	6 947	8 045	8 620	8 686
Chemistry	3 930	4 071	4 014	5 058	5 779	6 052
Physics	8 249	10 161	13 777	12 738	14 987	15 682
Mathematics	307	244	357	278	397	599
Engineering	5 950	8 071	11 085	12 391	12 732	13 920
Earth and space science	685	779	1 248	1 194	1 444	1 903
Central European Free Trade Association (CEFTA)						
Clinical medicine	2 201	1 835	2 174	2 194	2 969	2 867
Biomedical research	2 475	2 206	2 581	2 252	3 263	2 725
Biology	2 927	1 911	2 288	2 410	3 064	3 136
Chemistry	5 479	4 654	4 618	5 029	5 738	6 439
Physics	3 990	3 998	6 401	7 528	8 408	9 229
Mathematics	249	294	302	445	388	474
Engineering	2 404	2 227	3 496	3 482	4 651	4 336
Earth and space science	101	74	220	277	293	327
Other European Countries						
Clinical medicine	1 106	1 251	1 106	1 314	1 411	1 470
Biomedical research	1 290	1 891	1 572	1 532	1 827	1 651
Biology	2 103	1 885	2 251	2 414	2 610	3 011
Chemistry	7 801	5 208	5 737	5 676	6 538	6 750
Physics	11 901	11 250	13 340	14 976	17 009	18 220
Mathematics	312	310	484	513	508	773
Engineering	3 571	3 163	3 853	4 022	4 972	5 665
Earth and space science	875	728	983	991	1 397	1 495
North American Free Trade Association (NAFTA)						
Clinical medicine	157 613	180 795	237 870	241 162	256 182	269 212
Biomedical research	156 220	166 950	215 861	230 610	236 635	257 592
Biology	126 241	129 027	154 943	167 965	174 757	177 694
Chemistry	63 415	67 666	84 183	92 394	94 663	99 626
Physics	117 713	158 450	188 682	199 001	203 005	202 810
Mathematics	7 371	7 026	6 712	7 278	6 976	9 131
Engineering	122 725	147 113	217 148	230 477	251 471	268 676
Earth and space science	23 437	27 010	31 579	27 479	29 522	35 521
South American Countries						
Biomedical research	963	1 156	1 587	2 181	2 110	2 451
Biology	1 366	1 152	1 848	2 296	2 354	2 722
Chemistry	742	945	1 309	1 403	1 614	1 829
Physics	1 749	2 094	3 326	4 436	5 261	5 851
Mathematics	76	155	175	234	198	256
Engineering	926	1 047	1 371	1 619	2 298	2 405
Earth and space science	157	188	413	364	376	477

Table A.5.4: Number of Citations by Field of Science (continued)

	1980	1985	1990	1991	1992	1993
Developed Asian Economies						
Clinical medicine	7 170	10 825	19 173	21 369	25 692	28 033
Biomedical research	13 795	18 385	28 052	30 387	34 451	37 282
Biology	13 034	15 227	22 369	24 000	25 979	26 739
Chemistry	17 563	20 199	26 538	28 054	29 219	31 226
Physics	17 546	21 232	35 857	35 384	42 123	39 235
Mathematics	484	548	587	674	797	1 117
Engineering	16 888	21 464	34 864	36 831	41 018	43 194
Earth and space science	868	1 161	1 535	1 250	1 576	1 924
Association of South-East Asian Nations (ASEAN-4)						
Clinical medicine	370	320	538	577	532	715
Biomedical research	173	234	432	501	717	642
Biology	365	371	825	747	807	1 018
Chemistry	60	132	176	162	185	337
Physics	49	46	120	129	173	145
Mathematics	3	6	5	6	2	4
Engineering	85	103	273	187	283	220
Earth and space science	85	55	236	87	89	116
China and Hong Kong						
Clinical medicine	294	798	1 466	1 426	2 019	2 052
Biomedical research	175	589	1 297	1 274	1 921	1 637
Biology	144	481	754	900	1 070	1 359
Chemistry	129	933	1 889	2 153	2 503	2 941
Physics	270	1 297	4 575	3 945	5 470	5 821
Mathematics	43	62	223	326	314	366
Engineering	111	531	1 329	1 614	2 118	2 164
Earth and space science	30	377	302	318	387	445
Other Asian Countries						
Clinical medicine	1 107	849	1 134	1 140	1 122	1 329
Biomedical research	1 316	961	1 057	1 201	1 303	1 265
Biology	2 659	1 767	1 732	1 927	2 169	2 233
Chemistry	4 344	2 857	3 531	3 837	4 287	3 932
Physics	3 358	3 674	4 216	4 602	5 572	5 461
Mathematics	220	163	156	158	189	319
Engineering	1 934	1 634	1 775	1 838	2 437	2 125
Earth and space science	388	344	296	458	357	503
Oceania						
Clinical medicine	6 539	9 046	11 316	11 469	12 307	12 975
Biomedical research	6 159	7 320	8 002	8 422	9 170	10 638
Biology	8 376	8 530	10 322	10 053	11 532	11 703
Chemistry	3 933	3 641	3 766	3 596	4 267	4 645
Physics	3 858	4 838	5 431	5 617	6 444	6 824
Mathematics	307	337	266	328	345	614
Engineering	4 358	5 871	6 184	7 591	8 739	9 472
Earth and space science	1 928	2 141	2 965	2 746	3 053	3 671
Other Countries						
Clinical medicine	3 609	4 037	4 803	5 040	5 608	5 519
Biomedical research	2 880	3 520	3 853	4 271	4 618	4 694
Biology	4 038	3 851	4 361	5 203	4 658	5 183
Chemistry	1 717	2 326	2 118	2 246	2 303	2 483
Physics	4 191	5 203	5 506	6 219	6 685	8 059
Mathematics	340	345	316	488	382	629
Engineering	2 921	4 039	4 532	5 400	6 416	6 513
Earth and space science	463	576	823	632	725	710

Table A.5.4: Number of Citations by Field of Science (continued)

	1980	1985	1990	1991	1992	1993
Mediterranean Countries						
Clinical medicine	2 469	2 928	3 980	4 326	4 966	5 085
Biomedical research	2 559	3 202	3 492	4 260	4 665	4 682
Biology	3 415	3 238	3 689	4 247	4 239	4 609
Chemistry	1 851	2 478	2 139	2 643	2 681	3 028
Physics	3 947	5 035	5 239	6 157	6 982	8 041
Mathematics	326	299	310	512	411	640
Engineering	2 703	3 707	4 463	5 101	6 257	6 537
Earth and space science	278	413	501	427	571	513
World						
Clinical medicine	267 999	307 403	394 405	402 756	435 218	455 989
Biomedical research	261 149	287 997	371 920	393 147	411 184	444 180
Biology	222 836	222 739	270 951	290 082	306 838	319 455
Chemistry	160 650	163 552	191 858	205 617	216 500	233 098
Physics	227 954	277 643	340 647	355 323	377 232	378 819
Mathematics	13 186	12 193	12 060	12 943	13 170	18 010
Engineering	218 809	261 345	366 331	388 791	429 741	454 005
Earth and space science	35 011	39 405	46 641	42 441	46 586	54 616

Source: RASCI, Data: Science Citation Index

Second European Report on S&T Indicators, 1997

Table A.6.1: Number of EPO Patent Applications

By Priority Year

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
European Union (EU)	21 384	22 523	25 052	27 531	30 087	29 180	28 934	29 890	27 306	28 635
B	393	464	491	515	608	554	639	717	746	728
DK	229	223	238	319	396	436	452	505	429	547
D	9 321	9 750	10 996	12 004	12 576	11 957	11 966	12 172	11 275	11 702
EL	7	13	15	20	25	29	34	49	23	23
E	122	146	174	208	257	298	356	348	404	386
F	3 686	3 825	4 338	4 785	5 271	5 201	5 267	4 979	4 689	4 772
IRL	38	50	58	46	62	69	80	105	68	94
I	1 459	1 636	1 924	2 046	2 348	2 329	2 133	2 576	2 273	2 249
L	32	25	16	29	20	40	31	28	38	20
NL	1 153	1 253	1 455	1 584	1 682	1 577	1 505	1 522	1 428	1 254
A	576	522	615	649	698	682	699	667	664	643
P	6	6	11	9	5	8	10	14	21	16
FIN	179	215	282	326	492	571	524	711	643	811
S	960	880	914	925	1 174	1 192	1 171	1 304	1 110	1 526
UK	3 223	3 514	3 525	4 064	4 475	4 238	4 066	4 193	3 495	3 863
European Free Trade Association (EFTA)	1 625	1 561	1 825	1 905	2 094	1 965	1 900	2 074	1 880	1 882
IS	4	2	0	1	5	11	10	5	6	6
NO	125	114	113	157	254	192	242	268	203	215
CH	1 495	1 444	1 712	1 746	1 835	1 761	1 647	1 801	1 671	1 661
Central European Free Trade Association (CEFTA)	146	136	185	187	186	153	150	187	164	147
CZ	-	-	-	-	-	25	39	50	34	33
SK	..	..	..	..	..	..	..	..	..	..
HU	114	93	113	102	122	100	79	96	78	73
PL	19	29	24	27	16	28	29	24	31	15
Other European Countries	61	122	156	240	298	204	267	305	307	323
BG	20	9	22	18	13	8	4	9	12	3
RO	2	-	-	1	4	4	40	111	84	37
RU	-	-	-	-	-	185	200	166	187	259
UK	-	-	-	-	-	3	19	19	20	21
TR	2	3	1	4	4	4	4	0	4	4
North American Free Trade Association (NAFTA)	12 033	12 512	13 952	15 890	19 524	20 946	21 449	22 201	20 199	21 220
CA	418	455	544	562	759	749	791	828	807	892
MX	1	10	8	10	16	16	15	10	14	20
US	11 614	12 047	13 400	15 318	18 748	20 181	20 643	21 363	19 378	20 308
South American Countries	41	21	31	36	53	81	74	85	91	78
AR	6	4	9	9	14	19	14	17	17	12
BR	31	11	19	21	31	54	48	63	70	54
CL	2	1	2	2	4	3	4	1	1	3
VE	2	4	2	3	5	5	9	4	2	9
Developed Asian Economies	6 683	7 504	9 625	11 194	13 255	13 137	11 829	10 949	10 902	8 441
JP	6 619	7 447	9 538	11 081	13 064	12 875	11 478	10 522	10 408	7 941
KR	18	14	18	33	71	140	192	237	340	349
SG	4	6	4	7	25	12	28	53	36	46
TW	42	38	64	73	96	111	132	137	118	106

Table A.6.1: Number of EPO Patent Applications

By Priority Year (continued)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Association of South-East Asian Nations (ASEAN-4)										
	7	12	7	8	15	7	15	17	18	16
ID	1	3	2	1	2	2	3	4	5	0
MY	3	4	3	5	7	3	7	9	9	6
PH	1	4	0	2	3	0	4	0	2	5
TH	2	1	2	0	3	3	2	5	2	5
China and Hong Kong										
	66	43	48	69	46	66	70	79	119	143
CN	48	19	21	35	16	32	30	37	77	99
HK	18	24	27	34	31	34	40	41	42	44
Other Asian Countries										
	14	16	11	24	23	29	19	28	26	17
PK	1	-	-	-	-	-	-	0	-	-
IN	13	16	11	24	23	29	19	28	26	17
Oceania										
	524	428	400	442	716	683	767	849	815	849
AU	481	389	369	400	672	651	714	712	674	727
NZ	43	39	31	43	44	32	53	137	141	122
Other Countries										
	181	242	214	261	310	295	333	417	431	521
IL	109	150	149	169	225	229	266	303	322	420
ZA	72	92	64	92	85	66	67	114	109	101
World	42 827	45 195	51 581	57 863	66 700	66 853	65 915	67 193	62 361	62 401

Source: OST, Data: EPO

Table A.6.2: Number of EPO Patent Applications

By Publication Year

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
European Union (EU)											
	18 002	20 123	21 645	23 477	25 124	27 450	28 431	28 664	28 247	28 661	37 339
B	355	401	413	497	479	532	532	595	612	722	969
DK	200	218	226	234	140	277	381	431	467	469	830
D	8 053	8 865	9 387	10 297	11 022	11 845	11 959	11 793	11 659	11 835	14 698
EL	11	8	10	19	15	18	25	28	43	37	31
E	92	94	136	158	195	219	260	335	330	386	445
F	3 034	3 436	3 809	4 043	4 494	4 845	5 099	5 192	4 948	4 791	5 880
IRL	29	37	44	53	41	57	64	67	66	81	131
I	1 041	1 306	1 461	1 810	2 049	2 101	2 279	2 382	2 323	2 191	2 703
L	23	35	27	21	23	24	22	43	29	33	31
NL	1 014	1 160	1 198	1 287	1 533	1 572	1 540	1 497	1 485	1 422	1 783
A	425	518	526	566	604	670	694	686	610	685	871
P	2	6	7	9	7	8	6	7	14	17	23
FIN	134	146	178	211	262	369	496	514	586	620	1 104
S	793	892	895	882	745	964	1 157	1 136	1 123	1 309	2 140
UK	2 796	3 000	3 326	3 390	3 516	3 949	3 918	3 959	3 951	4 062	5 699
European Free Trade Association (EFTA)											
	1 519	1 617	1 588	1 658	1 816	1 958	2 017	1 955	1 909	1 999	2 347
IS	4	2	3	2	1	2	8	11	5	8	9
NO	81	121	142	96	95	140	225	215	239	249	356
CH	1 433	1 495	1 442	1 561	1 720	1 816	1 785	1 730	1 665	1 743	1 982
Central European Free Trade Association (CEFTA)											
	142	154	158	135	209	177	179	136	140	150	205
CZ	5	15	13	20	66	56	29	25	38	37	56
SK	..	..	..	..	..	..	..	..	..	..	..
HU	111	121	115	95	109	106	131	86	77	83	120
PL	26	18	30	21	34	15	19	25	24	30	30
Other European Countries											
	28	26	51	127	149	270	323	217	253	279	446
BG	20	15	20	12	22	16	12	5	7	4	14
RO	1	1	2	-	-	1	2	4	30	83	141
RU	2	9	26	113	122	251	304	196	201	166	258
UA	1	1	1	0	3	1	1	5	14	24	29
TR	5	-	3	2	2	2	3	6	2	3	4
North American Free Trade Association (NAFTA)											
	10 315	11 663	12 098	12 245	13 309	16 464	18 846	19 819	20 792	21 942	30 650
CA	390	393	424	487	535	566	576	735	762	833	1 299
MX	7	2	6	9	9	10	13	17	15	10	21
US	9 918	11 267	11 669	11 749	12 765	15 888	18 258	19 067	20 015	21 099	29 330
South American Countries											
	26	27	46	27	33	32	56	77	72	84	125
AR	5	7	8	6	10	6	18	15	18	16	18
BR	16	16	32	17	17	23	30	53	44	64	96
CL	2	2	3	2	2	2	4	1	5	2	3
VE	2	2	4	3	4	1	4	8	6	3	8
Developed Asian Economies											
	5 628	6 582	6 724	8 093	9 813	11 903	13 123	13 115	11 266	10 934	12 194
JP	5 602	6 532	6 652	8 010	9 728	11 760	12 909	12 823	10 915	10 495	11 580
KR	3	17	20	15	24	39	96	151	190	269	433
SG	2	6	6	6	4	16	19	14	33	47	54
TW	22	27	47	63	57	89	99	126	127	122	127

Table A.6.2: Number of EPO Patent Applications

By Publication Year (continued)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Association of South-East Asian Nations (ASEAN-4)											
	7	10	9	9	10	8	14	11	10	24	19
ID	2	-	2	2	3	0	2	2	3	6	2
MY	3	7	5	2	4	4	7	5	2	14	8
PH	2	1	0	4	2	2	1	1	1	3	4
TH	1	2	3	1	2	1	4	3	4	1	5
China and Hong Kong											
	10	60	32	47	44	63	57	69	77	85	157
CN	6	40	15	26	18	28	24	33	33	45	104
HK	5	20	16	21	25	35	33	36	44	40	53
Other Asian Countries											
	11	13	13	15	13	25	20	30	27	22	27
PK	-	1	-	-	-	-	-	-	0	-	-
IN	11	12	13	15	13	25	20	30	27	22	27
Oceania											
	390	447	528	398	311	552	662	735	725	875	1 320
AU	345	406	488	360	282	504	634	645	659	757	1 116
NZ	45	41	40	38	29	47	28	90	66	118	204
Other Countries											
	157	202	190	223	237	278	291	282	346	411	607
IL	81	122	116	151	157	183	217	218	272	296	480
ZA	75	81	74	72	80	95	74	64	75	115	128
World	36 269	40 985	43 150	46 534	51 129	59 257	64 111	65 165	63 974	65 582	85 615

Source: OST, Data: EPO

Second European Report on S&T Indicators, 1997

Table A.6.3: Number of EPO Patent Applications by Selected Economic Activity

By Publication Year

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
European Union (EU)											
All Sectors	18 002	20 123	21 645	23 477	25 124	27 450	28 431	28 664	28 247	28 661	37 339
Aerospace	55	62	66	95	90	95	93	97	94	80	91
Computers & Office Machinery	508	580	615	624	741	738	800	855	859	913	998
Electronics	1 172	1 340	1 423	1 540	1 758	1 897	2 008	2 009	2 084	2 241	2 772
Instruments	2 218	2 571	2 857	2 964	3 041	3 501	3 669	3 758	3 594	3 780	4 686
Pharmaceuticals	1 507	1 647	1 676	1 934	2 115	2 140	2 153	2 222	2 303	2 289	3 471
Chemicals	1 791	1 906	2 056	2 374	2 495	2 795	2 746	2 727	2 766	2 617	3 843
Electrical Machinery	1 474	1 670	1 819	1 851	1 938	2 095	2 257	2 242	2 168	2 167	2 713
Motor Vehicles	794	856	1 045	1 084	1 243	1 285	1 454	1 458	1 307	1 245	1 541
European Free Trade Association (EFTA)											
All Sectors	1 519	1 617	1 588	1 658	1 816	1 958	2 017	1 955	1 909	1 999	2 347
Aerospace	0	-	3	4	5	1	4	2	3	3	3
Computers & Office Machinery	31	41	28	38	17	34	22	25	44	37	38
Electronics	56	66	73	61	81	74	64	91	74	85	87
Instruments	224	219	261	236	282	281	311	301	279	295	351
Pharmaceuticals	140	164	136	160	161	146	149	164	164	147	201
Chemicals	130	136	124	155	150	167	156	143	133	159	195
Electrical Machinery	102	135	98	99	99	117	136	125	133	122	200
Motor Vehicles	27	33	33	35	29	38	31	33	32	40	42
Central European Free Trade Association (CEFTA)											
All Sectors	142	154	158	135	209	177	179	136	140	150	205
Aerospace	-	-	-	-	-	-	-	-	-	-	1
Computers & Office Machinery	3	1	-	2	2	1	2	-	1	3	2
Electronics	5	7	4	4	8	3	2	1	2	1	8
Instruments	16	16	24	18	31	26	23	10	21	26	21
Pharmaceuticals	28	47	29	24	30	29	49	44	31	34	44
Chemicals	13	21	19	11	32	25	26	18	21	17	28
Electrical Machinery	13	8	10	11	6	13	10	8	7	11	14
Motor Vehicles	1	5	6	8	12	7	10	1	4	5	12
Other European Countries											
All Sectors	28	26	51	127	149	270	323	217	253	279	446
Aerospace	-	-	-	-	-	3	1	-	6	11	10
Computers & Office Machinery	-	-	-	12	1	4	4	3	5	7	7
Electronics	2	1	0	2	5	4	12	5	9	12	20
Instruments	2	2	6	16	31	43	58	41	31	44	72
Pharmaceuticals	4	6	4	8	10	23	25	14	19	23	43
Chemicals	4	2	1	6	12	22	22	14	22	22	49
Electrical Machinery	-	4	4	9	14	20	23	19	13	25	29
Motor Vehicles	1	1	2	5	3	8	11	3	9	9	13
North American Free Trade Association (NAFTA)											
All Sectors	10 315	11 663	12 098	12 245	13 309	16 464	18 846	19 819	20 792	21 942	30 650
Aerospace	27	46	65	57	53	61	64	73	49	60	97
Computers & Office Machinery	673	848	829	814	1 003	1 374	1 574	1 644	1 723	1 663	2 181
Electronics	896	1 030	1 053	1 132	1 132	1 544	1 850	1 945	2 095	2 257	3 005
Instruments	1 634	1 845	2 049	2 060	2 302	2 863	3 379	3 608	3 963	4 330	5 768
Pharmaceuticals	1 149	1 273	1 332	1 417	1 611	1 844	2 125	2 218	2 535	2 544	4 432
Chemicals	1 324	1 490	1 554	1 606	1 903	2 148	2 237	2 261	2 366	2 406	3 500
Electrical Machinery	695	783	838	841	808	1 089	1 223	1 151	1 241	1 310	1 759
Motor Vehicles	247	301	308	262	295	386	427	428	422	448	557

Table A.6.3: Number of EPO Patent Applications by Selected Economic Activity

By Publication Year (continued)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
South American Countries											
All Sectors	26	27	46	27	33	32	56	77	72	84	125
Aerospace	-	-	-	-	-	-	-	-	-	1	-
Computers & Office Machinery	0	-	1	0	1	1	2	1	3	4	1
Electronics	1	1	2	-	0	2	3	5	1	1	3
Instruments	-	2	8	4	3	6	10	13	6	11	23
Pharmaceuticals	1	2	2	3	2	1	5	3	5	5	6
Chemicals	2	2	3	4	4	4	7	8	9	7	5
Electrical Machinery	0	1	1	0	3	3	3	5	6	7	7
Motor Vehicles	3	1	3	-	-	-	1	2	3	1	4
Developed Asian Economies											
All Sectors	5 628	6 582	6 724	8 093	9 813	11 903	13 123	13 115	11 266	10 934	12 194
Aerospace	3	2	2	3	5	5	9	6	6	4	1
Computers & Office Machinery	643	792	737	914	1 157	1 523	1 782	1 683	1 443	1 360	1 204
Electronics	649	797	773	965	1 308	1 551	1 935	2 122	1 708	1 656	1 820
Instruments	850	947	987	1 268	1 562	1 935	2 199	2 076	1 798	1 738	1 784
Pharmaceuticals	556	680	694	841	892	942	1 018	952	888	916	1 263
Chemicals	588	764	800	1 031	1 246	1 408	1 412	1 349	1 205	1 140	1 353
Electrical Machinery	456	552	535	607	651	851	958	991	832	907	1 003
Motor Vehicles	223	238	251	261	396	440	404	325	299	236	295
Association of South-East Asian Nations (ASEAN-4)											
All Sectors	7	10	9	9	10	8	14	11	10	24	19
Aerospace	-	-	-	-	-	-	-	-	-	-	-
Computers & Office Machinery	-	-	-	-	-	-	1	1	0	2	0
Electronics	-	-	1	1	-	-	3	1	1	1	1
Instruments	-	-	1	1	-	1	1	1	1	1	2
Pharmaceuticals	1	0	1	0	1	1	1	0	0	2	2
Chemicals	0	0	1	0	1	2	2	1	1	3	1
Electrical Machinery	-	1	1	-	-	0	2	-	1	1	2
Motor Vehicles	-	-	-	-	-	-	-	-	1	0	1
China and Hong Kong											
All Sectors	10	60	32	47	44	63	57	69	77	85	157
Aerospace	-	-	-	-	0	-	-	-	-	-	2
Computers & Office Machinery	-	2	1	1	1	2	3	4	5	6	6
Electronics	-	4	-	3	2	5	6	5	5	5	9
Instruments	1	8	3	8	6	8	11	10	10	6	16
Pharmaceuticals	1	2	1	1	1	4	5	3	5	8	16
Chemicals	0	6	0	15	1	8	2	3	1	5	12
Electrical Machinery	2	7	12	16	14	12	5	12	18	12	21
Motor Vehicles	-	5	-	2	1	1	3	3	1	4	6
Other Asian Countries											
All Sectors	11	13	13	15	13	25	20	30	27	22	27
Aerospace	-	-	-	-	-	-	-	-	-	-	-
Computers & Office Machinery	-	-	-	-	-	1	1	1	-	0	-
Electronics	-	-	-	-	-	0	0	1	2	2	0
Instruments	0	0	-	1	-	2	2	2	0	1	1
Pharmaceuticals	7	6	6	7	7	13	10	14	12	3	9
Chemicals	3	1	5	5	2	5	3	6	6	3	7
Electrical Machinery	-	0	-	-	0	-	1	-	1	2	2
Motor Vehicles	-	-	-	-	-	1	-	-	-	1	-

Table A.6.3: Number of EPO Patent Applications by Selected Economic Activity

By Publication Year (continued)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Oceania											
All Sectors	390	447	528	398	311	552	662	735	725	875	1 320
Aerospace	1	2	1	1	-	1	-	2	4	-	3
Computers & Office Machinery	6	7	8	4	5	9	15	18	23	22	25
Electronics	10	16	13	11	13	15	31	27	29	36	57
Instruments	46	66	77	56	58	79	96	101	107	104	157
Pharmaceuticals	21	34	30	37	26	40	47	45	53	61	132
Chemicals	23	32	32	23	21	36	47	41	45	55	112
Electrical Machinery	20	17	32	31	13	35	48	52	38	60	61
Motor Vehicles	12	21	24	16	8	21	23	63	21	44	51
Other Countries											
All Sectors	157	202	190	223	237	278	291	282	346	411	607
Aerospace	1	2	-	-	1	1	-	-	1	2	3
Computers & Office Machinery	0	1	3	5	4	3	12	19	26	32	29
Electronics	6	3	3	7	8	9	20	23	35	32	67
Instruments	16	27	33	43	36	42	62	57	66	93	122
Pharmaceuticals	13	22	16	27	36	35	35	29	36	37	84
Chemicals	10	17	15	23	19	24	22	24	27	26	51
Electrical Machinery	9	9	11	12	14	29	20	21	20	23	41
Motor Vehicles	5	5	4	3	5	6	5	5	6	5	6
World											
All Sectors	36 269	40 985	43 150	46 534	51 129	59 257	64 111	65 165	63 974	65 582	85 615
Aerospace	87	115	136	161	154	166	171	182	164	160	212
Computers & Office Machinery	1 868	2 275	2 223	2 415	2 933	3 690	4 219	4 252	4 134	4 055	4 493
Electronics	2 797	3 265	3 348	3 725	4 317	5 106	5 937	6 235	6 046	6 330	7 858
Instruments	5 010	5 710	6 312	6 684	7 362	8 797	9 844	9 998	9 887	10 445	13 035
Pharmaceuticals	3 428	3 892	3 927	4 472	4 900	5 223	5 632	5 725	6 064	6 080	9 732
Chemicals	3 893	4 384	4 615	5 247	5 893	6 647	6 687	6 605	6 613	6 468	9 174
Electrical Machinery	2 774	3 190	3 363	3 492	3 560	4 270	4 692	4 615	4 492	4 661	5 864
Motor Vehicles	1 314	1 466	1 679	1 681	1 993	2 194	2 371	2 287	2 108	2 040	2 530

Source: OST, Data: EPO

Second European Report on S&T Indicators, 1997

Table A.6.4: Number of European Patent Applications by Region
By Year of Filing

	1989	1990	1991	1992	1993	1994	1995
EUROPEAN UNION (EU)	29 965.9	32 371.3	29 203.3	30 776.0	30 948.0	32 108.7	33 651.4
B	604.8	696.8	608.2	742.6	873.6	901.2	908.7
DK	403.6	424.5	461.4	465.0	534.5	589.4	605.7
D	13 041.2	13 784.0	11 626.7	12 502.2	12 630.5	12 978.6	13 832.0
EL	22.0	29.3	38.4	47.7	48.7	34.9	40.1
E	224.1	280.3	333.3	356.1	375.2	464.3	447.4
F	5 004.6	5 488.6	5 239.6	5 444.4	5 137.6	5 233.6	5 463.3
IRL	50.2	81.5	70.2	87.2	112.1	93.5	127.2
I	2 136.3	2 520.0	2 273.3	2 626.9	2 433.1	2 537.4	2 568.5
L	33.5	32.8	40.1	34.1	23.2	41.6	25.9
NL	1 659.5	1 829.7	1 620.3	1 641.3	1 658.2	1 731.5	1 742.8
A	715.7	727.3	705.9	728.8	704.5	745.4	771.9
P	9.6	5.5	9.0	13.5	15.6	22.2	14.1
FIN	392.0	510.8	579.5	546.1	731.1	787.1	848.0
S	1 123.1	1 237.0	1 217.1	1 239.8	1 332.1	1 458.5	1 722.4
UK	4 545.7	4 723.2	4 380.2	4 300.5	4 338.2	4 489.5	4 533.5
BELGIUM	604.8	696.8	608.2	742.6	873.6	901.2	908.7
Reg. Bruxelles-Cap/Brussels							
Hfdst. Gewest	60.1	76.3	49.8	79.2	79.4	83.9	93.2
Vlaams Gewest	254.3	340.9	349.9	480.5	577.3	609.7	617.2
Antwerpen	84.8	121.8	105.6	203.8	287.3	271.4	273.3
Limburg (B)	11.5	24.5	22.3	22.1	21.1	24.2	35.5
Oost-Vlaanderen	48.0	59.7	73.4	73.8	79.9	89.7	85.5
Vlaams Brabant	62.4	72.7	89.4	116.0	126.5	151.3	147.4
West-Vlaanderen	47.6	62.1	59.2	64.9	62.6	73.1	75.6
Région Wallonne	91.0	101.0	142.4	146.7	163.4	176.2	171.8
Brabant Wallon	31.6	22.5	48.6	50.0	59.4	68.4	66.1
Hainaut	12.8	12.7	25.6	25.5	24.9	33.1	26.6
Liege	38.8	59.2	50.1	54.6	64.5	56.3	62.8
Luxembourg (B)	2.8	3.6	4.9	5.6	8.2	9.8	4.3
Namur	5.0	3.0	13.3	11.1	6.5	8.6	12.0
Not registered by region	199.3	178.7	66.1	36.1	53.6	31.5	26.5
DENMARK	403.6	424.5	461.4	465.0	534.5	589.4	605.7

Table A.6.4: Number of European Patent Applications by Region

By Year of Filing (continued)

	1989	1990	1991	1992	1993	1994	1995
GERMANY	13 041.2	13 784.0	11 626.7	12 502.2	12 630.5	12 978.6	13 832.0
Baden-Württemberg	2 846.6	3 179.6	2 744.8	2 857.0	2 818.4	2 839.2	2 931.0
Stuttgart	1 084.7	1 165.7	1 093.2	1 127.7	1 065.7	1 216.1	1 244.8
Karlsruhe	708.3	727.9	621.6	695.4	740.5	660.2	717.1
Freiburg	596.8	751.0	563.9	654.9	614.7	554.3	551.4
Tübingen	456.7	535.0	466.1	379.1	397.5	408.6	417.9
Bayern	2 792.8	2 816.0	2 397.5	2 611.3	2 614.3	2 692.9	2 733.6
Oberbayern	2 121.8	2 073.1	1 669.6	1 751.9	1 458.7	1 294.2	1 339.1
Niederbayern	100.5	110.9	124.0	118.8	100.7	120.7	88.3
Oberpfalz	48.5	65.2	56.7	58.7	108.7	144.0	135.0
Oberfranken	47.8	44.9	44.3	41.5	88.9	138.0	133.3
Mittelfranken	23.4	37.0	37.0	46.6	280.8	426.0	450.9
Unterfranken	140.9	160.2	153.7	224.6	219.8	241.5	252.1
Schwaben	310.0	324.6	312.2	369.1	356.7	328.5	335.0
Berlin	319.8	316.6	266.5	283.1	274.9	318.5	335.5
Brandenburg	54.2	65.4	49.4	60.7	38.4	38.4	48.5
Bremen	70.2	89.7	65.5	44.5	60.1	38.3	42.2
Hamburg	193.5	232.7	179.5	203.4	263.1	269.6	275.2
Hessen	1 406.3	1 427.8	1 280.0	1 371.3	1 367.8	1 487.8	1 538.8
Darmstadt	1 188.8	1 207.1	1 087.6	1 145.5	1 130.6	1 223.0	1 299.5
Gießen	114.6	120.1	103.4	139.4	156.8	152.4	155.7
Kassel	103.0	100.5	89.0	86.4	80.4	112.4	83.6
Mecklenburg-Vorpommern	30.6	42.6	27.7	52.3	31.4	14.7	18.0
Niedersachsen	459.5	448.6	427.4	434.0	588.9	722.8	639.5
Braunschweig	41.8	35.8	38.1	42.4	77.8	156.2	143.5
Hannover	224.2	247.9	229.9	238.2	260.6	279.7	234.6
Lüneburg	109.6	88.3	78.8	72.3	141.5	151.5	138.5
Weser-Ems	83.9	76.7	80.5	81.2	109.0	135.4	122.9
Nordrhein-Westfalen	3 133.2	3 196.2	2 573.9	2 750.8	2 759.7	2 840.2	3 025.9
Düsseldorf	1 347.7	1 330.3	1 087.4	1 076.1	1 081.1	1 062.1	1 131.6
Köln	986.5	1 024.3	761.5	878.9	809.2	849.0	966.6
Münster	238.6	265.1	238.5	225.6	265.1	254.3	274.3
Detmold	215.9	231.7	161.8	198.4	181.5	197.0	190.4
Arnsberg	344.5	344.8	324.7	371.7	422.9	478.0	463.1
Rheinland-Pfalz	953.5	1 056.9	810.9	905.3	881.7	778.3	896.4
Koblenz	387.9	426.0	310.1	365.1	255.9	165.7	184.1
Trier	56.5	60.7	45.8	44.1	42.0	36.2	33.8
Rheinhausen-Pfalz	509.1	570.2	455.0	496.1	583.8	576.4	678.6
Saarland	56.5	77.0	40.8	59.3	79.4	99.1	82.3
Sachsen	73.9	94.6	77.0	107.1	90.4	141.8	149.9
Sachsen-Anhalt	5.9	6.0	12.3	6.9	20.8	40.1	51.1
Dessau	-	-	1.0	1.0	5.8	8.1	10.1
Halle	2.0	0.6	1.0	1.2	7.7	20.7	21.0
Magdeburg	3.9	5.3	10.3	4.7	7.2	11.2	20.0
Schleswig-Holstein	166.8	171.9	136.9	169.0	169.6	199.5	161.1
Thüringen	224.4	246.5	238.7	223.2	161.5	65.3	66.6
Not registered by region	253.6	316.2	298.2	363.3	410.2	392.2	836.5

Table A.6.4: Number of European Patent Applications by Region
By Year of Filing (continued)

	1989	1990	1991	1992	1993	1994	1995
GREECE	22.0	29.3	38.4	47.7	48.7	34.9	40.1
Voreia Ellada	1.0	5.0	3.5	2.4	7.0	-	4.3
Anatoliki Makedonia, Thraki	1.0	1.0	1.0	1.0	-	-	-
Kentriki Makedonia	-	4.0	2.5	-	6.0	-	4.0
Dytiki Makedonia	-	-	-	0.4	1.0	-	0.3
Thessalia	-	-	-	1.0	-	-	-
Kentriki Ellada	3.0	1.0	1.0	0.3	2.0	-	2.0
Ipeiros	-	-	-	-	-	-	1.0
Ionia Nisia	-	-	-	-	-	-	-
Dytiki Ellada	1.0	1.0	-	-	2.0	-	-
Stereia Ellada	2.0	-	-	-	-	-	-
Peloponnisos	-	-	1.0	0.3	-	-	1.0
Attiki	-	2.0	6.0	6.2	4.0	6.0	2.0
Nisia Aigaiou, Kriti	-	-	1.0	-	-	1.0	-
Vorieo Aigaio	-	-	-	-	-	-	-
Notio Aigaio	-	-	-	-	-	-	-
Kriti	-	-	1.0	-	-	1.0	-
Not registered by region	18.0	21.3	26.9	38.8	35.7	27.9	31.8
SPAIN	224.1	280.3	333.3	356.1	375.2	464.3	447.4
Noroeste	3.0	4.8	7.3	7.5	12.1	14.5	7.9
Galicia	1.0	1.1	3.0	2.0	2.6	6.5	2.0
Principado de Asturias	-	2.6	4.3	1.5	5.0	6.5	5.9
Cantabria	2.0	1.0	-	4.0	4.5	1.5	-
Noreste	23.2	13.9	36.7	38.8	53.0	47.3	36.9
Pais Vasco	16.2	8.5	16.7	15.3	24.9	30.6	20.2
Comunidad Foral de Navarra	3.0	3.3	13.0	11.5	8.8	6.7	8.0
La Rioja	-	-	2.0	2.0	3.3	2.0	-
Aragon	4.0	2.0	5.0	10.0	16.0	8.0	8.7
Comunidad de Madrid	35.2	61.4	78.9	84.3	99.5	92.4	82.3
Centro (E)	6.2	4.8	5.6	7.8	16.3	9.5	13.3
Castilla y Leon	5.2	3.8	3.6	5.6	12.8	7.5	8.6
Castilla-la Mancha	1.0	1.0	-	2.2	2.5	2.0	3.8
Extremadura	-	-	2.0	-	1.0	-	1.0
Este	89.0	128.3	130.5	143.1	131.0	205.4	193.9
Cataluna	79.1	113.7	111.5	127.2	105.6	153.9	155.2
Comunidad Valenciana	10.0	12.6	19.0	15.0	22.5	46.5	35.5
Islas Baleares	-	2.0	-	1.0	3.0	5.0	3.2
Sur	7.3	7.3	18.8	11.8	20.3	24.2	12.7
Andalucia	7.3	7.3	17.5	6.8	16.3	21.3	10.7
Region de Murcia	-	-	1.3	5.0	4.0	2.9	1.0
Ceuta y Melilla	-	-	-	-	-	-	1.0
Canarias	2.0	1.0	0.5	1.0	1.0	6.0	2.0
Not registered by region	58.2	59.0	55.0	61.7	42.1	64.9	98.4

Table A.6.4: Number of European Patent Applications by Region

By Year of Filing (continued)

	1989	1990	1991	1992	1993	1994	1995
FRANCE	5 004.6	5 488.6	5 239.6	5 444.4	5 137.6	5 233.6	5 463.3
Île de France	2 199.5	2 289.7	2 246.9	2 364.7	2 142.7	2 152.4	2 221.6
Bassin Parisien	579.5	660.7	599.1	613.1	581.1	623.1	673.4
Champagne-Ardenne	62.6	71.2	67.1	72.4	65.0	60.4	51.6
Picardie	107.3	127.6	115.9	130.5	122.2	94.7	130.2
Haute-Normandie	101.9	107.5	111.4	89.3	88.0	90.9	108.2
Centre	120.0	150.0	133.7	150.7	142.8	195.0	185.5
Basse-Normandie	41.5	48.4	56.9	69.6	58.6	79.3	63.3
Bourgogne	146.3	156.1	114.1	100.5	104.5	102.8	134.7
Nord-Pas de Calais	108.6	121.7	129.3	131.1	131.7	130.5	114.9
Est	396.1	434.4	394.9	443.9	415.3	423.0	409.3
Lorraine	119.3	149.7	114.3	117.1	101.4	109.6	134.3
Alsace	203.9	207.0	193.4	249.7	227.5	223.1	191.1
Franche-Comté	72.8	77.7	87.2	77.1	86.4	90.3	84.0
Ouest	242.7	273.7	271.4	254.5	323.0	319.6	363.7
Pays de la Loire	87.0	104.7	102.5	99.0	141.0	106.2	138.1
Bretagne	110.9	121.2	124.5	105.7	119.5	133.4	144.9
Poitou-Charentes	44.8	47.8	44.4	49.8	62.5	80.0	80.7
Sud-Ouest	270.4	307.0	280.7	302.7	269.3	287.1	285.2
Aquitaine	120.1	139.7	126.0	125.6	117.0	111.5	103.4
Midi-Pyrénées	126.3	146.1	137.2	156.6	130.8	154.7	160.2
Limousin	24.0	21.2	17.5	20.5	21.6	21.0	21.6
Centre-Est	807.2	984.0	879.0	907.2	902.0	913.1	990.7
Rhône-Alpes	768.0	911.2	807.8	834.3	834.7	843.7	918.7
Auvergne	39.2	72.9	71.2	72.8	67.3	69.4	72.0
Méditerranée	352.5	378.2	405.7	393.8	340.6	346.5	376.3
Languedoc-Roussillon	68.6	77.5	85.7	89.0	77.1	79.2	86.7
Provence-Alpes-Côte d'Azur	283.9	300.7	320.0	304.9	263.5	267.3	289.6
Corse	-	-	-	-	-	-	-
Departements d'outre-mer	-	-	-	-	-	-	-
Guadeloupe	-	-	-	-	-	-	-
Martinique	-	-	-	-	-	-	-
Guyane	-	-	-	-	-	-	-
Reunion	-	-	-	-	-	-	-
Not registered by region	48.1	39.3	32.7	33.5	31.9	38.3	28.3
IRELAND	50.2	81.5	70.2	87.2	112.1	93.5	127.2
ITALY	2 136.3	2 520.0	2 273.3	2 626.9	2 433.1	2 537.4	2 568.5
Nord Ovest	298.3	359.7	298.4	324.5	339.6	331.9	329.1
Piemonte	251.2	309.5	261.2	259.5	258.1	258.8	252.0
Valle d'Aosta	2.0	1.5	2.0	1.0	1.0	2.0	1.0
Liguria	45.1	48.7	35.3	64.0	80.5	71.1	76.1
Lombardia	685.3	779.5	671.1	823.7	772.8	757.6	712.7
Nord Est	230.6	309.6	253.9	299.1	292.2	311.7	329.2
Trentino-Alto Adige	17.6	28.1	15.0	17.9	14.6	20.5	34.6
Veneto	163.0	217.4	189.3	228.1	229.4	225.7	228.7
Friuli-Venezia Giulia	50.0	64.1	49.6	53.1	48.2	65.6	65.8
Emilia-Romagna	134.1	174.6	204.8	241.0	212.1	264.4	261.1
Centro (I)	109.2	155.7	140.2	198.7	149.0	172.7	138.9
Toscana	64.3	103.4	100.3	153.3	104.1	120.3	98.0
Umbria	13.4	17.3	9.4	8.4	11.2	10.4	12.7
Marche	31.5	34.9	30.5	37.0	33.7	42.1	28.2
Lazio	114.4	145.0	134.5	164.5	153.6	136.2	110.1
Abruzzi-Molise	15.3	9.9	11.2	14.1	13.5	14.0	22.2
Abruzzi	14.8	9.9	10.5	13.6	11.6	14.0	22.2
Molise	0.5	-	0.6	0.5	1.8	-	-
Campania	13.3	12.0	17.6	25.0	31.4	33.7	20.1
Sud	10.0	13.7	12.7	17.1	13.2	16.2	12.6
Puglia	9.0	8.8	12.2	14.0	10.3	15.5	11.0
Basilicata	0.2	-	-	0.8	0.8	-	1.3
Calabria	0.8	4.8	0.5	2.3	2.2	0.8	0.3
Sicilia	28.3	23.5	30.6	26.3	31.1	46.1	41.2
Sardegna	4.3	7.0	5.8	6.0	5.4	8.5	4.0
Not registered by region	493.3	530.1	492.6	486.9	419.2	444.5	587.5

Table A.6.4: Number of European Patent Applications by Region
By Year of Filing (continued)

	1989	1990	1991	1992	1993	1994	1995
LUXEMBOURG	33.5	32.8	40.1	34.1	23.2	41.6	25.9
NETHERLANDS	1 659.5	1 829.7	1 620.3	1 641.3	1 658.2	1 731.5	1 742.8
Noord-Nederland	51.5	78.4	75.8	66.7	73.1	88.8	84.8
Groningen	19.1	28.3	19.7	21.0	24.6	30.9	29.1
Friesland	16.5	26.3	26.1	19.0	27.7	33.7	31.6
Drenthe	15.9	23.8	30.0	26.6	20.8	24.2	24.1
Oost-Nederland	196.6	239.3	229.3	217.9	228.0	298.1	302.9
Overijssel	77.8	89.4	99.1	78.8	70.8	94.9	100.8
Gelderland	105.8	136.2	126.8	129.0	146.4	193.2	187.9
Flevoland	13.0	13.7	3.4	10.1	10.8	10.0	14.2
West-Nederland	527.4	553.6	554.7	547.0	564.2	604.2	619.8
Utrecht	81.0	87.2	86.3	69.2	79.1	90.6	94.0
Noord-Holland	194.8	181.7	197.8	200.3	175.3	179.4	178.8
Zuid-Holland	234.7	268.0	254.6	270.5	295.0	317.6	330.5
Zeeland	17.0	16.6	16.1	6.9	14.8	16.6	16.5
Zuid-Nederland	788.2	825.5	657.1	725.8	728.3	661.4	593.2
Noord-Brabant	700.0	728.1	572.2	619.3	618.1	558.0	510.6
Limburg (NL)	88.2	97.3	84.8	106.5	110.2	103.4	82.6
Not registered by region	95.8	133.0	103.5	84.0	64.6	79.0	142.1
AUSTRIA	715.7	727.3	705.9	728.8	704.5	745.4	771.9
Östösterreich	262.3	248.8	281.2	296.9	252.9	285.2	278.9
Burgenland	7.0	4.8	9.7	7.4	6.7	2.7	6.0
Niederösterreich	98.5	97.8	126.4	110.7	103.7	124.0	111.0
Wien	156.8	146.3	145.1	178.8	142.5	158.5	161.9
Südösterreich	173.4	148.8	150.6	151.9	152.0	127.0	135.5
Karnten	25.9	25.3	23.1	35.5	29.2	39.6	27.5
Steiermark	147.5	123.5	127.5	116.4	122.8	87.3	108.0
Westösterreich	268.6	318.2	254.1	262.7	281.1	310.0	277.2
Oberösterreich	136.1	158.5	119.4	96.5	145.3	137.2	133.9
Salzburg	43.5	41.6	25.5	41.0	27.7	37.1	31.4
Tirol	44.9	48.0	44.6	70.1	53.0	72.2	45.9
Vorarlberg	44.1	70.1	64.7	55.1	55.1	63.5	66.0
Not registered by region	11.4	11.5	19.9	17.2	18.6	23.3	80.3
PORTUGAL	9.6	5.5	9.0	13.5	15.6	22.2	14.1
Continente	1.3	0.6	4.7	6.0	8.0	13.4	5.2
Norte	-	-	2.0	1.0	3.0	5.2	4.0
Centro (P)	-	-	-	-	1.2	3.0	0.5
Lisboa e Vale do Tejo	0.8	0.6	2.7	4.5	3.7	5.3	0.2
Alentejo	0.5	-	-	0.5	-	-	0.5
Algarve	-	-	-	-	0.2	-	-
Açores	-	-	-	-	-	-	0.5
Madeira	-	-	-	-	-	-	-
Not registered by region	8.4	4.9	4.3	7.4	7.6	8.8	8.4
FINLAND	392.0	510.8	579.5	546.1	731.1	787.1	848.0
Manner-Suomi	228.1	285.7	318.9	325.2	381.7	407.3	404.2
Uusimaa	4.6	4.9	3.2	5.0	6.0	3.9	5.5
Etela-Suomi	154.3	176.5	192.3	203.6	232.9	224.6	246.4
Ita-Suomi	12.2	30.8	27.5	19.4	23.5	35.0	27.8
Vali-Suomi	37.3	46.4	51.1	38.4	57.6	61.3	40.2
Pohjois-Suomi	19.8	27.1	44.7	58.9	61.8	82.7	84.3
Ahvenanmaa/Åland	1.0	1.0	-	-	1.0	-	-
Not registered by region	163.0	224.2	260.7	220.9	348.3	379.8	443.8
SWEDEN	1 123.1	1 237.0	1 217.1	1 239.8	1 332.1	1 458.5	1 722.4
Stockholm	277.2	295.6	323.4	341.5	394.4	390.5	521.8
Ostra Mellansverige	131.7	152.9	125.9	154.2	189.1	185.4	246.3
Smaland med oarna	27.9	48.6	44.5	54.9	57.0	69.6	69.4
Sydsverige	83.6	84.2	94.3	121.5	135.7	181.9	234.8
Vastsverige	175.7	200.5	203.5	174.8	214.3	276.4	321.8
Norra Mellansverige	35.8	51.9	60.8	69.4	89.4	129.2	131.4
Mellersta Norrland	6.7	10.0	2.0	6.0	10.0	4.3	7.5
Ovre Norrland	31.4	20.7	28.7	47.3	56.7	62.8	68.5
Not registered by region	353.2	372.6	334.0	270.1	185.6	158.6	121.0

Table A.6.4: Number of European Patent Applications by Region
By Year of Filing (continued)

	1989	1990	1991	1992	1993	1994	1995
UNITED KINGDOM	4 545.7	4 723.2	4 380.2	4 300.5	4 338.2	4 489.5	4 533.5
North	21.3	35.4	39.0	42.5	65.8	83.9	90.9
Cleveland, Durham	8.2	22.6	15.9	20.1	23.3	30.9	27.0
Cumbria	2.1	1.0	3.7	4.0	8.2	5.6	10.5
Northumberland, Tyne and Wear	11.0	11.8	19.5	18.4	34.3	47.4	53.4
Yorkshire and Humberside	78.7	77.2	91.7	97.7	101.1	116.2	118.5
Humberside	9.9	6.4	3.8	7.2	9.4	9.9	8.6
North Yorkshire	6.6	17.3	24.0	19.5	26.8	29.2	37.6
South Yorkshire	23.0	22.8	17.2	19.2	27.4	30.7	20.3
West Yorkshire	39.1	30.7	46.7	51.9	37.5	46.4	52.0
East Midlands	126.6	122.8	121.3	153.5	123.8	134.9	155.2
Derbyshire, Nottinghamshire	62.9	56.8	60.3	88.8	55.8	73.4	83.0
Leicestershire, Nottinghamshire	56.2	59.0	56.2	56.7	60.4	55.0	66.3
Lincolnshire	7.5	7.0	4.8	8.0	7.6	6.5	5.9
East Anglia	130.8	159.5	184.6	157.6	184.5	223.0	234.6
South East (UK)	661.2	763.8	820.1	780.5	824.3	808.2	756.8
Bedfordshire, Hertfordshire	92.5	116.7	137.5	90.4	111.0	85.6	87.2
Berkshire, Buckinghamshire.							
Oxfordshire	158.3	185.6	167.2	185.5	207.3	186.5	205.0
Surrey, East-West Sussex	95.5	119.5	102.5	90.1	118.1	122.6	103.2
Essex	47.6	60.3	59.0	73.8	62.3	58.0	55.5
Greater London	190.9	214.4	271.7	255.6	239.6	272.7	242.2
Hampshire, Isle of Wight	43.8	33.7	52.9	52.7	57.0	46.9	25.4
Kent	32.5	33.6	29.3	32.4	29.2	35.8	38.4
South West (UK)	117.6	118.7	120.2	120.0	125.3	155.3	156.4
Avon, Gloucestershire, Wiltshire	88.6	85.6	81.1	86.1	81.3	106.4	117.9
Cornwall, Devon	14.3	15.7	14.7	20.8	26.9	24.3	17.5
Dorset, Somerset	14.7	17.4	24.4	13.1	17.1	24.6	21.0
West Midlands	150.8	190.3	175.0	186.9	174.6	216.7	194.8
Hereford & Worcester, Warwickshire	43.1	57.7	56.0	44.3	38.9	50.6	42.3
Shropshire, Staffordshire	16.8	13.4	29.6	32.8	26.4	37.0	32.0
West Midlands (county)	90.9	119.2	89.4	109.8	109.3	129.1	120.4
North West (UK)	270.1	288.5	289.6	337.1	342.7	311.7	334.2
Cheshire	67.2	68.4	70.5	113.4	104.5	105.8	98.4
Greater Manchester	81.6	92.7	101.4	116.9	105.6	81.1	98.0
Lancashire	121.3	127.4	117.6	106.8	132.6	124.9	137.8
Merseyside	-	-	-	-	-	-	-
Wales	37.8	58.8	52.9	62.4	66.2	46.6	65.1
Clwyd, Dyfed, Gwynedd, Powys	5.6	7.1	12.8	12.1	17.4	9.9	19.0
Gwent, Mid-South-West Glamorgan	32.2	51.8	40.1	50.4	48.8	36.7	46.0
Scotland	83.4	124.3	93.6	95.4	114.8	122.9	138.1
Borders-Central-Fife-Lothian-Tayside	27.7	44.5	38.2	31.3	36.1	40.5	68.9
Dumfries & Galloway, Strathclyde	32.8	55.3	34.0	33.1	52.5	59.8	36.7
Highlands, Islands	0.3	1.0	0.3	2.0	1.0	3.0	2.0
Grampian	22.6	23.5	21.0	29.0	25.2	19.6	30.6
Northern Ireland	-	-	-	-	-	-	-
Not registered by region	2 867.5	2 783.9	2 392.2	2 266.8	2 215.1	2 270.1	2 289.0

Notes

1995 is provisional

Source: EPO

Table A.6.5: Number of USPTO Granted Patents

By Priority Year

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
European Union (EU) ^a													
	12 853	14 464	15 274	16 141	16 839	17 578	17 854	17 460	16 244	15 883	15 196	14 908	15 097
B	246	272	282	337	328	321	369	357	368	352	380	375	423
DK	160	155	170	169	190	200	153	231	198	169	173	181	174
D	5 540	6 335	6 892	7 207	7 354	7 618	7 752	7 472	6 845	6 797	6 409	6 260	6 137
EL	..	..	..	..	..	..	..	..	..	..	..	..	..
E	66	98	92	118	117	124	146	145	133	161	192	171	179
F	2 081	2 254	2 361	2 579	2 719	2 937	2 922	3 037	2 954	2 816	2 704	2 584	2 623
IRL	26	25	34	44	51	63	51	54	56	49	47	45	46
I	726	945	955	1 098	1 139	1 268	1 229	1 280	1 240	1 241	1 256	1 186	1 053
L	..	..	..	..	..	..	..	..	..	..	..	..	..
NL	645	725	772	798	839	981	1 000	915	794	819	768	818	766
A	283	277	312	335	338	378	368	395	329	300	254	234	274
P	..	..	..	..	..	..	..	..	..	..	..	..	..
FIN	181	200	218	211	264	262	310	347	344	308	251	267	306
S	743	809	789	771	749	724	747	655	684	698	707	786	897
UK	2 156	2 369	2 397	2 474	2 751	2 702	2 807	2 572	2 299	2 173	2 056	2 002	2 218
European Free Trade Association (EFTA) ^b													
	1 115	1 235	1 256	1 369	1 304	1 446	1 450	1 312	1 281	1 227	1 173	1 223	1 123
IS	..	..	..	..	..	..	..	..	..	..	..	..	..
NO	66	88	99	126	115	120	94	117	119	124	134	145	149
CH	1 049	1 147	1 157	1 243	1 189	1 326	1 356	1 195	1 162	1 103	1 038	1 078	974
Central European Free Trade Association (CEFTA)													
	151	177	155	150	136	155	127	110	90	64	48	48	45
CZ	..	..	..	..	..	..	..	..	..	..	..	..	..
SK	..	..	..	..	..	..	..	..	..	..	..	..	..
CS	37	38	39	39	26	40	32	16	14	19	15	21	17
HU	105	118	111	102	101	98	87	86	67	42	29	22	24
PL	9	21	5	9	9	17	8	8	9	3	5	5	5
Other European Countries ^c													
	137	104	126	130	157	171	171	145	85	52	49	40	9
BG	22	9	30	23	17	24	15	9	5	3	1	1	0
RO	..	..	..	..	..	..	..	..	..	..	..	..	..
RU	..	..	..	..	..	..	..	..	..	..	..	..	..
UA	..	..	..	..	..	..	..	..	..	..	..	..	..
SU	115	95	96	107	140	147	156	136	80	49	48	39	9
TR	..	..	..	..	..	..	..	..	..	..	..	..	..
North American Free Trade Association (NAFTA)													
	37 693	35 810	37 576	39 141	40 611	44 338	48 997	52 087	55 026	55 018	56 000	58 938	58 696
CA	1 090	1 294	1 300	1 402	1 672	1 883	2 032	1 937	2 037	1 922	1 902	1 965	2 059
MX	25	36	38	45	31	37	38	32	42	47	54	53	48
US	36 578	34 480	36 238	37 694	38 908	42 418	46 927	50 118	52 947	53 049	54 043	56 920	56 589
South American Countries ^d													
	50	57	63	72	85	59	89	95	109	113	155	157	169
AR	12	13	15	18	24	13	10	27	24	24	29	38	37
BR	23	27	31	28	36	31	61	41	57	56	80	84	88
CL	..	..	..	..	..	..	..	..	..	..	..	..	..
VE	15	17	17	26	25	15	18	27	28	33	47	35	44
Developed Asian Economies (DAE) ^e													
	10 951	12 622	14 654	15 806	17 620	20 626	22 770	23 466	24 441	23 858	24 846	25 518	25 476
JP	10 795	12 428	14 332	15 369	16 962	19 863	21 637	22 029	22 550	21 740	22 104	22 194	21 579
KR	39	36	70	86	141	207	408	507	780	865	1 252	1 516	1 867
SG	..	..	..	..	..	..	..	..	..	..	..	..	..
TW	117	158	252	351	517	556	725	930	1 111	1 253	1 490	1 808	2 030

Table A.6.5: Number of USPTO Granted Patents

By Priority Year (continued)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Association of South-East Asian Nations (ASEAN-4)													

ID	..	..	..	..	..	..	..	..	..	..	..	..	..
MY	..	..	..	..	..	..	..	..	..	..	..	..	..
PH	..	..	..	..	..	..	..	..	..	..	..	..	..
TH	..	..	..	..	..	..	..	..	..	..	..	..	..
China and Hong Kong													
	23	32	39	92	85	98	107	94	116	114	128	119	167
CN	1	9	13	52	42	52	45	44	53	49	63	57	74
HK	22	23	26	40	43	46	62	50	63	65	65	62	93
Other Asian Countries ^f													
	10	14	14	18	10	20	27	25	22	35	44	39	54
PK	..	..	..	..	..	..	..	..	..	..	..	..	..
IN	10	14	14	18	10	20	27	25	22	35	44	39	54
Oceania													
	329	378	415	488	485	490	477	490	454	463	426	516	514
AU	293	332	367	426	432	445	425	447	417	426	393	485	477
NZ	36	46	48	62	53	45	52	43	37	37	33	31	37
Other Countries													
	227	281	275	320	425	380	442	422	398	431	406	450	505
IL	153	191	186	231	295	284	318	324	310	338	317	353	387
ZA	74	90	89	89	130	96	124	98	88	93	89	97	118
World	63 636	65 280	69 952	73 842	77 893	85 494	92 662	95 865	98 437	97 510	98 412	101 747	101 491

Notes

.. Data not available or below threshold value

1992-1994 are estimations; for details see Methodological Annex

a Not including Greece, Luxembourg and Portugal*b* Not including Iceland*c* Not including Romania and Turkey; not including Russia and the Ukraine, but including the former Soviet Union*d* Not including Chile*e* Not including Singapore*f* Not including Pakistan**Source: Fraunhofer-ISI, Data: USPTO****Second European Report on S&T Indicators, 1997**

Table A.6.6: Number of USPTO Granted Patents
By Publication Year

	1980	1985	1990	1991	1992	1993	1994	1995
European Union (EU) a								
	13 440	15 244	17 623	17 885	16 977	16 210	15 891	16 095
B	257	277	330	351	350	378	373	421
DK	157	187	158	210	193	197	207	199
D	5 782	6 718	7 612	7 680	7 310	6 893	6 732	6 600
EL	..	..	..	..	..	..	..	..
E	65	78	130	153	133	159	141	148
F	2 087	2 400	2 866	3 030	3 029	2 908	2 779	2 821
IRL	17	30	54	55	55	53	50	52
I	806	919	1 260	1 209	1 271	1 286	1 215	1 078
L	..	..	..	..	..	..	..	..
NL	654	766	959	992	854	801	853	799
A	267	318	393	359	370	313	289	338
P	..	..	..	..	..	..	..	..
FIN	121	200	304	331	360	293	312	358
S	822	857	768	716	627	635	706	806
UK	2 405	2 494	2 789	2 799	2 425	2 294	2 234	2 475
European Free Trade Association (EFTA) b								
	1 344	1 323	1 396	1 446	1 304	1 243	1 295	1 186
IS	..	..	..	..	..	..	..	..
NO	79	90	112	111	108	117	126	130
CH	1 265	1 233	1 284	1 335	1 196	1 126	1 169	1 056
Central European Free Trade Association (CEFTA)								
	179	173	149	120	110	82	73	73
CZ	..	..	..	..	..	..	..	..
SK	..	..	..	..	..	..	..	..
CS	55	54	39	27	17	13	19	15
HU	87	108	93	85	88	61	46	50
PL	37	11	17	8	5	8	8	8
Other European Countries c								
	483	168	201	188	71	70	57	13
BG	23	21	27	10	5	5	4	1
RO	..	..	..	..	..	..	..	..
RU	..	..	..	..	..	..	..	..
UA	..	..	..	..	..	..	..	..
SU	460	147	174	178	66	65	53	12
TR	..	..	..	..	..	..	..	..
North American Free Trade Association (NAFTA)								
	38 478	40 929	49 281	53 245	54 255	55 220	58 117	57 883
CA	1 081	1 342	1 862	2 035	1 964	1 944	2 008	2 104
MX	41	32	32	28	39	45	44	40
US	37 356	39 555	47 387	51 182	52 252	53 231	56 065	55 739
South American Countries d								
	53	56	78	102	82	112	115	123
AR	18	11	17	16	20	24	32	31
BR	24	30	41	61	40	57	60	63
CL	..	..	..	..	..	..	..	..
VE	11	15	20	25	22	31	23	29
Developed Asian Economies e								
	7 197	12 961	20 482	22 335	23 464	24 261	24 770	24 545
JP	7 124	12 746	19 525	21 027	21 926	22 293	22 384	21 764
KR	8	41	225	404	538	779	943	1 161
SG	..	..	..	..	..	..	..	..
TW	65	174	732	904	1 000	1 189	1 443	1 620

Table A.6.6: Number of USPTO Granted Patents

By Publication Year (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Association of South-East Asian Nations (ASEAN-4)								

ID	..	..	..	..	..	..	..	..
MY	..	..	..	..	..	..	..	..
PH	..	..	..	..	..	..	..	..
TH	..	..	..	..	..	..	..	..
China and Hong Kong								
	28	26	99	102	101	113	105	148
CN	1	1	47	52	41	53	48	62
HK	27	25	52	50	60	60	57	86
Other Asian Countries <i>f</i>								
	4	10	23	22	24	30	27	37
PK	..	..	..	..	..	..	..	..
IN	4	10	23	22	24	30	27	37
Oceania								
	316	373	484	504	454	417	504	503
AU	265	340	432	463	410	378	467	459
NZ	51	33	52	41	44	39	37	44
Other Countries								
	187	275	414	410	432	407	451	507
IL	113	179	299	305	335	314	350	384
ZA	74	96	115	105	97	93	101	123
World	61 819	71 661	90 364	96 513	97 441	98 342	101 675	101 419

Notes

.. Data not available or below threshold value

a Not including Greece, Luxembourg and Portugal*b* Not including Iceland*c* "Not including Romania and Turkey; not including Russia and the Ukraine, but including the former Soviet Union"*d* Not including Chile*e* Not including Singapore*f* Not including Pakistan**Source: Fraunhofer-ISI, Data: USPTO**

Table A.6.7: Number of USPTO Granted Patents by Selected Economic Activity
By Publication Year

	1980	1985	1990	1991	1992	1993	1994	1995
European Union (EU) a								
All sectors	13 440	15 244	17 623	17 885	16 977	16 210	15 891	16 095
Aerospace	181	221	231	246	274	249	205	205
Computers & office machinery	278	369	392	451	399	456	457	536
Electronics	1 149	1 524	1 939	2 052	1 778	1 756	1 907	2 060
Instruments	1 377	1 602	1 868	1 951	1 770	1 665	1 785	1 791
Pharmaceuticals	423	410	616	631	656	668	595	674
Chemicals	2 172	2 157	2 717	2 861	2 822	2 851	2 554	2 666
Electrical machinery	772	955	1 035	1 015	990	888	958	965
Motor vehicles	325	407	489	487	458	468	403	391
European Free Trade Association (EFTA) b								
All sectors	1 344	1 323	1 396	1 446	1 304	1 243	1 295	1 186
Aerospace	6	6	4	6	5	6	9	8
Computers & office machinery	30	28	21	21	30	23	33	26
Electronics	79	79	79	108	90	90	95	98
Instruments	164	164	194	182	169	143	200	150
Pharmaceuticals	58	40	62	60	56	60	47	64
Chemicals	300	263	277	273	250	247	230	220
Electrical machinery	55	90	66	50	66	73	72	64
Motor vehicles	20	15	10	12	7	7	11	4
Central European Free Trade Association (CEFTA) c								
All sectors	179	173	149	120	110	82	73	73
Aerospace	1	1	1	1	..	..	..	..
Computers & office machinery	1	2	3	1	1	0	1	0
Electronics	9	14	9	2	2	2	3	2
Instruments	16	13	24	11	9	2	7	8
Pharmaceuticals	14	17	16	18	22	19	12	13
Chemicals	56	50	42	36	46	33	24	33
Electrical machinery	7	5	9	3	5	3	7	4
Motor vehicles	1	4	5	2	1	1	1	1
Other European Countries								
All sectors	483	168	201	188	71	70	57	13
Aerospace	1	1	1	1	..	..	2	..
Computers & office machinery	5	5	2	1	..	..	1	..
Electronics	35	8	14	11	4	8	4	1
Instruments	59	34	32	32	12	13	9	2
Pharmaceuticals	9	4	6	8	6	2	0	2
Chemicals	62	15	18	15	11	12	7	3
Electrical machinery	66	20	16	22	8	2	2	0
Motor vehicles	3	3	3	4	..	..	..	1
North American Free Trade Association (NAFTA)								
All sectors	38 478	40 929	49 281	53 245	54 255	55 220	58 117	57 883
Aerospace	355	387	400	470	547	507	505	453
Computers & office machinery	939	1 299	1 855	1 975	2 240	2 796	3 189	3 634
Electronics	4 102	4 840	6 486	7 190	7 228	7 376	8 330	8 958
Instruments	4 458	4 943	6 488	7 230	7 385	7 640	8 823	8 421
Pharmaceuticals	698	743	1 233	1 406	1 547	1 762	1 589	1 793
Chemicals	4 884	4 886	5 063	5 600	6 042	6 164	5 594	5 540
Electrical machinery	2 255	2 623	3 011	3 169	3 144	3 192	3 424	3 688
Motor vehicles	693	739	876	996	950	960	966	1 048
South American Countries d								
All sectors	53	56	78	102	82	112	115	123
Aerospace	1	..	..	..	..	..	1	1
Computers & office machinery	1	..	1	..	..	..	2	1
Electronics	5	3	3	5	3	5	6	5
Instruments	7	7	5	10	9	17	14	16
Pharmaceuticals	0	1	2	3	2	2	2	4
Chemicals	3	10	6	6	7	11	14	15
Electrical machinery	3	1	5	5	8	9	4	5
Motor vehicles	1	..	1	1	2	2	2	2

Table A.6.7: Number of USPTO Granted Patents by Selected Economic Activity

By Publication Year (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Developed Asian Economies e								
All sectors	7 197	12 961	20 482	22 335	23 464	24 261	24 770	24 545
Aerospace	137	257	317	315	304	261	207	212
Computers & office machinery	279	927	1 629	1 820	2 011	2 125	2 224	2 336
Electronics	1 070	2 066	4 205	4 919	5 458	5 872	6 608	7 026
Instruments	1 245	1 993	3 407	3 556	3 523	3 874	3 817	3 695
Pharmaceuticals	170	219	342	341	402	425	387	391
Chemicals	938	1 364	1 907	2 045	2 162	2 295	2 072	2 002
Electrical machinery	486	920	1 468	1 532	1 640	1 622	1 538	1 734
Motor vehicles	214	510	756	795	728	615	572	497
Association of South-East Asian Nations (ASEAN-4)								
All sectors	..	..	..	..	..	..	..	..
Aerospace	..	..	..	..	..	..	..	..
Computers & office machinery	..	..	..	..	..	..	..	..
Electronics	..	..	..	..	..	..	..	..
Instruments	..	..	..	..	..	..	..	..
Pharmaceuticals	..	..	..	..	..	..	..	..
Chemicals	..	..	..	..	..	..	..	..
Electrical machinery	..	..	..	..	..	..	..	..
Motor vehicles	..	..	..	..	..	..	..	..
China and Hong Kong								
All sectors	28	26	99	102	101	113	105	148
Aerospace	..	..	1	1	..	1	1	1
Computers & office machinery	0	2	4	2	3	3	3	9
Electronics	3	..	..	..	..	..	..	..
Instruments	4	5	15	14	9	11	9	13
Pharmaceuticals	..	..	1	1	2	2	2	4
Chemicals	1	0	8	9	8	12	6	12
Electrical machinery	1	3	21	19	18	13	14	14
Motor vehicles	1	..	3	2	..	1	1	3
Other Asian Countries f								
All sectors	4	10	23	22	24	30	27	37
Aerospace	..	..	..	..	..	..	..	..
Computers & office machinery	..	..	..	..	..	..	..	..
Electronics	..	..	3	2	3	2	3	4
Instruments	..	..	..	..	..	..	..	..
Pharmaceuticals	1	1	1	1	5	9	3	6
Chemicals	3	6	15	10	12	15	11	13
Electrical machinery	..	..	..	..	1	..	..	1
Motor vehicles	..	..	..	..	..	..	1	..
Oceania								
All sectors	316	373	484	504	454	417	504	503
Aerospace	3	5	6	7	5	5	2	6
Computers & office machinery	3	5	7	12	6	4	9	15
Electronics	16	24	41	31	35	32	28	41
Instruments	46	43	59	52	44	53	58	74
Pharmaceuticals	3	5	10	19	17	20	32	31
Chemicals	24	28	37	39	29	27	40	34
Electrical machinery	11	17	21	34	29	23	28	19
Motor vehicles	9	11	18	14	11	9	9	12
Other Countries								
All sectors	187	275	414	410	432	407	451	507
Aerospace	..	2	..	3	2	3	3	3
Computers & office machinery	2	3	19	12	9	24	24	41
Electronics	8	25	43	42	46	49	78	93
Instruments	25	38	70	77	87	56	77	69
Pharmaceuticals	5	5	21	19	24	32	16	20
Chemicals	30	27	44	41	47	40	37	44
Electrical machinery	14	14	38	20	26	33	29	38
Motor vehicles	2	5	3	3	3	3	6	5

Table A.6.7: Number of USPTO Granted Patents by Selected Economic Activity
By Publication Year (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Other Countries								
All sectors	187	275	414	410	432	407	451	507
Aerospace	..	2	..	3	2	3	3	3
Computers & office machinery	2	3	19	12	9	24	24	41
Electronics	8	25	43	42	46	49	78	93
Instruments	25	38	70	77	87	56	77	69
Pharmaceuticals	5	5	21	19	24	32	16	20
Chemicals	30	27	44	41	47	40	37	44
Electrical machinery	14	14	38	20	26	33	29	38
Motor vehicles	2	5	3	3	3	3	6	5
World								
All sectors	61 819	71 661	90 364	96 513	97 441	98 342	101 675	101 419
Aerospace	686	881	961	1 055	1 136	1 034	936	891
Computers & office machinery	1 538	2 645	3 938	4 299	4 701	5 440	5 961	6 618
Electronics	6 468	8 585	12 837	14 387	14 680	15 235	17 111	18 337
Instruments	7 403	8 856	12 174	13 125	13 038	13 489	14 836	14 277
Pharmaceuticals	1 378	1 440	2 311	2 505	2 737	3 005	2 693	3 009
Chemicals	8 450	8 790	10 121	10 915	11 423	11 689	10 589	10 592
Electrical machinery	3 662	4 643	5 682	5 865	5 935	5 853	6 074	6 538
Motor vehicles	1 275	1 693	2 164	2 317	2 163	2 065	1 976	1 967

Notes

.. Data not available or below threshold value

a Not including Greece, Luxembourg and Portugal

b Not including Iceland

c Not including Romania and Turkey; not including Russia and the Ukraine, but including the former Soviet Union

d Not including Chile

e Not including Singapore

f Not including Pakistan

Source: Fraunhofer-ISI, Data: USPTO

Second European Report on S&T Indicators, 1997

Table A.6.8: Number of National Patents in Mediterranean Countries

	1980	1985	1990	1991	1992	1993	1994	1995
AL ^a	..	..	..	..	..	..	..	..
CY	66	43	43	53	57	..	..	..
Residents	1	..	-	-	-	..	..	..
Non residents	65	..	..	53	57	..	..	..
DZ	354	277	185	139	144	121	..	..
Residents	5	19	-	-	-	2	..	..
Non residents	349	258	185	139	144	119	..	..
EG	807	839	789	787	818	831	684	..
Residents	76	168	278	308	301	328	..	..
Non residents	731	671	511	479	517	503	..	..
IL	..	3 480	4 100	3 717	3 727	3 953	3 962	..
Residents	..	790	1 052	1 087	1 400	1 318	1 261	..
Non residents	..	2 690	3 048	2 630	2 327	2 635	2 701	..
LB	..	..	..	..	..	..	..	..
MA	344	290	329	356	380	298	360	381
Residents	29	35	61	55	58	42	107	89
Non residents	315	255	268	301	322	256	253	292
MT	24	20	19	27	25	24	42	..
Residents	7	-	2	6	3	8	21	..
Non residents	17	20	17	21	22	16	21	..
SY	104	..	..	15	16	29	26	49
Residents	6	..	..	3	4	10	6	4
Non residents	98	..	..	12	12	19	20	45
TN	241	216	160	128	119	142	144	115
Residents	27	14	26	25	22	40	38	31
Non residents	214	202	134	103	97	102	106	84
TR	484	385	486	694	675	792	..	1 118
Residents	32	61	49	63	54	52	..	70
Non residents	452	324	437	631	621	740	..	1 048

Notes

Residents are nationals from the country considered; non-residents are others

^a Patents filed in Albania are not included since there were less than ten of them

Source: OECD
 WIPO
 National sources

Table A.7.1: Total Imports in High-Tech Products

Million ECU (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Association of South-East Asian Nations (ASEAN-4)								
	3 255	7 781	..	13 532	14 768	20 234	25 544	32 016
ID	568	1 670	1 287	1 640	1 610	2 198	1 761	1 869
MY	1 475	4 068	4 994	6 637	7 368	10 538	14 777	18 457
PH	488	628	..	1 876	1 264	1 879	1 873	2 499
TH	724	1 415	3 405	3 378	4 527	5 619	7 133	9 192
China and Hong Kong								
	..	6 501	..	..	20 304	28 306	34 540	39 786
CN	..	536	..	..	6 727	10 415	13 219	12 309
HK	1 913	5 966	..	..	13 577	17 891	21 321	27 477
Other Asian Countries								
	..	3 392	1 531	1 390	1 455	2 429	2 201	2 342
PK	..	1 081	402	607	446	607	511	564
IN	418	2 311	1 130	783	1 009	1 823	1 691	1 777
Oceania								
	2 416	7 297	6 568	6 974	6 641	7 265	9 094	9 969
AU	1 979	5 888	5 350	5 970	5 510	6 074	7 483	8 225
NZ	437	1 409	1 217	1 004	1 131	1 191	1 611	1 744
Other Countries								
	..	4 004	..	..	3 167	4 046	5 101	5 967
IL	..	1 352	990	1 155	1 234	1 692	2 166	2 560
ZA	1 916	2 652	..	..	1 932	2 354	2 935	3 407
Mediterranean Countries								

AL	..	..	..	..	..	..	..	..
CY	57	212	142	120	212	146	295	277
DZ	806	1 168	..	..	417	392	650	600
EG	..	376	..	..	..	..	395	406
IL	..	1 352	990	1 155	1 234	1 692	2 166	2 560
LB	..	163	..	..	..	..	..	..
MA	205	342	..	..	..	378	609	394
MT	..	118	419	481	561	622	..	..
SY	128	253	..	..	..	..	..	..
TN	175	283	273	293	399	454	403	364
TR	..	1 492	1 550	1 758	2 018	3 266	2 339	3 120

Source: UN COMTRADE database

Second European Report on S&T Indicators, 1997

Table A.7.2: Total Imports in High-Tech Products by Product Group

Million ECU

	1980	1985	1990	1991	1992	1993	1994	1995
EUR 15								
Aerospace	12 635	22 644	23 362	27 218	22 796	19 981	20 386	16 912
<i>Of which intra-EU</i>	4 426	8 433	8 089	11 121	9 367	7 400	7 600	6 184
Computers & Office Machinery	9 566	31 604	43 042	46 300	47 663	48 992	55 855	64 059
<i>Of which intra-EU</i>	5 349	16 371	21 752	23 022	22 968	21 849	24 227	29 433
Electronics	12 998	28 617	31 580	35 019	37 693	40 352	48 854	56 812
<i>Of which intra-EU</i>	6 773	13 366	14 550	15 332	16 721	16 857	20 949	25 263
Instruments	7 655	14 663	15 582	16 456	17 135	16 081	17 694	18 842
<i>Of which intra-EU</i>	4 210	7 574	8 316	8 496	8 955	7 591	8 403	9 119
Pharmaceuticals	3 598	7 469	6 024	6 877	7 774	8 187	9 022	10 363
<i>Of which intra-EU</i>	2 529	5 194	3 760	4 369	4 710	4 814	5 619	6 517
Electrical Machinery	814	1 500	4 012	4 435	4 123	4 234	5 194	6 047
<i>Of which intra-EU</i>	489	831	1 733	1 785	1 885	1 607	1 800	2 212
Chemicals	2 839	5 370	8 669	8 821	8 557	8 216	9 467	10 480
<i>Of which intra-EU</i>	2 090	3 877	5 696	5 823	5 769	5 285	6 148	6 554
Non-electrical Machinery	8 025	13 281	7 163	7 265	7 283	5 640	6 004	6 745
<i>Of which intra-EU</i>	5 608	8 843	4 198	4 436	4 604	2 986	2 994	3 222
Armament	1 366	2 236	1 404	1 399	1 457	1 142	1 343	1 152
<i>Of which intra-EU</i>	878	1 278	409	480	371	314	486	396
US								
Aerospace	2 015	7 584	5 986	6 810	7 624	7 724	7 871	6 486
Computers & Office Machinery	862	6 994	18 468	21 452	24 914	32 773	39 315	43 498
Electronics	5 661	27 786	22 218	24 237	25 786	33 347	41 156	49 169
Instruments	1 473	5 788	5 050	5 672	5 933	7 058	7 509	7 835
Pharmaceuticals	374	1 777	1 035	1 353	1 636	1 974	2 198	2 408
Electrical Machinery	315	1 030	1 635	1 608	1 750	2 235	2 719	3 030
Chemicals	437	1 246	1 785	1 938	1 961	2 146	2 404	2 368
Non-electrical Machinery	1 914	6 139	1 466	1 583	1 449	1 857	2 148	2 597
Armament	370	1 136	437	507	494	652	710	553
JP								
Aerospace	1 252	3 567	2 881	2 992	2 832	3 061	3 620	2 459
Computers & Office Machinery	686	1 893	3 710	4 081	4 274	5 430	7 088	11 410
Electronics	999	2 844	3 915	4 673	4 400	6 472	8 960	13 673
Instruments	807	1 938	2 032	2 261	2 148	2 656	3 304	3 707
Pharmaceuticals	703	1 563	1 201	1 343	1 534	1 739	1 787	1 870
Electrical Machinery	61	116	690	752	626	709	1 122	1 416
Chemicals	320	819	1 766	1 938	1 920	2 026	2 145	2 232
Non-electrical Machinery	548	1 124	509	556	477	638	669	964
Armament	66	231	88	296	148	138	349	265

Source: UN COMTRADE database

Second European Report on S&T Indicators, 1997

Table A.7.3: Total Exports in High-Tech Products

Million ECU (continued)

	1980	1985	1990	1991	1992	1993	1994	1995
Association of South-East Asian Nations (ASEAN-4)	1 318	4 120	..	11 342	12 798	18 141	25 314	30 335
ID	72	128	113	183	382	754	1 157	1 289
MY	943	2 958	4 752	6 417	7 875	11 526	16 120	19 431
PH	58	373	..	1 620	858	1 210	1 526	1 892
TH	245	660	2 381	3 122	3 683	4 650	6 511	7 723
China and Hong Kong	..	3 834	..	..	6 991	8 480	11 151	14 408
CN	..	173	..	..	3 355	4 549	6 974	10 003
HK	1 278	3 661	..	..	3 636	3 932	4 178	4 405
Other Asian Countries	..	484	394	489	476	598	809	1 035
PK	..	33	2	1	1	4	2	2
IN	69	452	391	488	475	595	807	1 033
Oceania	352	562	608	797	842	1 119	1 614	1 606
AU	301	423	535	709	745	998	1 436	1 392
NZ	52	140	73	88	96	121	178	213
Other Countries	..	..	..	..	1 376	1 755	2 000	2 596
IL	..	1 256	874	948	1 054	1 376	1 690	2 081
ZA	170	..	..	..	322	379	310	516
Mediterranean Countries	..	..	..	..	..	..	..	..
AL	..	..	..	..	..	..	..	..
CY	9	42	14	13	12	8	9	10
DZ	1	0	..	..	3	5	2	1
EG	..	2	..	..	..	..	5	6
IL	..	1 256	874	948	1 054	1 376	1 690	2 081
LB	..	25	..	..	..	..	..	..
MA	3	11	..	..	..	46	39	10
MT	..	99	350	465	587	539	..	..
SY	4	4	..	..	..	..	..	..
TN	18	45	40	38	37	73	45	53
TR	..	242	88	77	101	132	190	158

Source: UN COMTRADE database

Second European Report on S&T Indicators, 1997

Table A.7.4: Total Exports in High-Tech Products by Product Group

Million ECU

	1980	1985	1990	1991	1992	1993	1994	1995
EUR 15								
Aerospace	12 264	26 608	23 764	28 208	27 076	24 581	25 090	25 778
<i>Of which intra-EU</i>	4 707	10 121	9 824	11 767	10 251	8 514	8 731	8 095
Computers & Office Machinery	7 848	24 697	30 335	33 107	32 336	35 727	41 485	49 834
<i>Of which intra-EU</i>	5 835	18 144	23 946	25 726	24 874	26 330	30 525	37 145
Electronics	13 326	26 684	26 677	29 163	31 255	37 234	48 088	57 092
<i>Of which intra-EU</i>	6 692	13 734	15 574	16 379	17 623	19 367	24 806	29 751
Instruments	7 790	16 980	15 477	16 635	17 480	18 434	20 205	21 643
<i>Of which intra-EU</i>	4 165	7 904	8 143	8 717	9 290	8 916	9 954	10 927
Pharmaceuticals	5 293	10 615	6 760	7 411	8 697	9 852	11 041	12 407
<i>Of which intra-EU</i>	2 498	5 012	3 618	3 958	4 622	4 792	5 363	6 081
Electrical Machinery	713	1 296	3 283	3 362	3 423	3 366	4 216	4 993
<i>Of which intra-EU</i>	480	859	1 962	1 786	1 887	1 734	2 122	2 916
Chemicals	4 413	8 315	9 838	10 108	9 952	10 170	11 423	12 024
<i>Of which intra-EU</i>	2 183	3 922	5 601	5 681	5 461	5 309	6 272	6 698
Non-electrical Machinery	13 652	21 440	7 353	7 385	7 065	7 241	7 100	8 279
<i>Of which intra-EU</i>	5 813	9 353	3 911	3 809	3 870	3 121	3 261	3 718
Armament	1 789	3 159	1 723	1 382	1 371	1 578	1 710	1 821
<i>Of which intra-EU</i>	989	1 295	339	379	363	382	416	428
US								
Aerospace	3 553	10 458	20 949	25 918	26 325	24 447	22 117	16 027
Computers & Office Machinery	5 375	13 249	17 370	18 664	18 657	20 639	22 876	24 176
Electronics	5 644	8 442	15 576	16 476	17 210	22 772	28 772	32 249
Instruments	3 983	9 094	8 112	9 470	9 571	11 312	12 080	12 464
Pharmaceuticals	1 022	2 285	2 185	2 418	2 661	3 110	3 085	3 027
Electrical Machinery	313	564	1 039	1 252	1 220	1 507	1 636	1 915
Chemicals	994	1 953	2 433	2 500	2 531	2 747	2 980	2 819
Non-electrical Machinery	3 048	7 127	2 632	2 231	2 482	3 293	3 582	4 233
Armament	1 457	3 617	2 357	2 549	2 783	2 810	3 265	3 265
JP								
Aerospace	667	2 492	202	204	275	261	336	299
Computers & Office Machinery	1 428	11 058	16 496	18 410	20 234	24 415	25 196	24 145
Electronics	6 579	26 773	25 310	28 669	28 403	34 273	40 121	43 536
Instruments	1 785	5 248	5 326	6 068	5 822	6 890	7 669	8 237
Pharmaceuticals	101	323	370	486	572	645	620	751
Electrical Machinery	301	719	2 018	2 330	2 399	3 098	3 637	4 125
Chemicals	350	728	771	919	877	994	1 065	1 113
Non-electrical Machinery	2 284	6 301	1 832	1 979	1 839	2 026	2 475	3 297
Armament	165	293	62	61	68	78	113	69

Source: UN COMTRADE database

Second European Report on S&T Indicators, 1997

Table A.7.5: Total Imports and Exports in High-Tech Products between Country Groups

Million ECU

Imports 1985

“Declaring Countries”	Partner countries																
	EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World	
EU 15	65 768	5 988	210	198	30 963	30 016	259	12 929	11 338	1 044	1 117	116	208	348	520	127 384	
EFTA	4 805	103	15	9	1 356	1 307	10	509	475	12	26	4	3	24	32	6 944	
CEFTA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Other Europe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NAFTA	15 648	1 370	51	14	18 117	10 948	468	27 711	22 694	2 857	2 480	101	181	605	605	76 871	
of which US	14 269	1 232	43	10	7 129	-	453	26 404	21 499	2 838	2 364	100	170	584	585	59 480	
Other American	1 279	136	7	6	2 197	2 094	138	469	452	1	12	0	7	27	22	4 383	
DAE ^a	4 487	666	4	20	14 895	14 676	194	4 823	4 225	1 075	474	41	59	85	39	27 447	
of which JP	2 423	481	3	20	9 750	9 596	168	505	-	101	162	3	17	77	26	14 095	
ASEAN-4	1 894	145	12	2	2 501	2 465	18	2 452	1 742	362	131	15	49	15	15	7 781	
CN and HK	759	99	1	0	1 298	1 244	6	2 459	1 971	174	496	3	47	147	11	6 501	
Other Asian	1 520	147	43	195	777	742	10	565	443	16	44	0	9	1	3	3 392	
Oceania	2 075	152	4	1	2 655	2 490	66	1 808	1 677	31	100	4	179	30	18	7 297	
IL and ZA	2 105	208	0	1	1 252	1 224	6	315	310	0	25	0	13	20	19	4 004	
Med. Countries ^b	3 414	275	48	30	1 122	1 003	4	417	398	6	27	9	3	3	11	5 758	

^a Not including Taiwan^b Not including Albania**Imports 1990**

“Declaring Countries”	Partner countries																
	EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World	
EU 15	68 504	5 163	178	393	32 974	31 491	297	18 482	14 868	1 439	1 601	172	272	499	926	140 837	
EFTA	5 358	70	13	5	2 020	1 981	17	806	706	18	68	6	6	49	50	8 633	
CEFTA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Other Europe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NAFTA	13 778	789	26	103	17 152	9 728	460	29 646	21 057	3 579	2 030	51	254	557	566	73 124	
of which US	11 903	653	17	99	7 237	-	408	27 731	19 583	3 455	1 869	47	208	533	550	58 081	
Other American ^a	679	90	12	3	1 360	1 227	74	484	451	4	22	1	3	61	59	2 950	
DAE ^b	4 666	552	3	15	16 809	16 510	99	7 295	5 636	2 606	1 394	50	103	59	63	34 897	
of which JP	2 677	381	2	13	11 146	10 945	78	1 001	-	462	332	3	39	54	20	16 791	
ASEAN-4 ^c	1 756	115	9	4	3 582	3 519	6	3 336	1 943	256	190	21	54	10	10	9 686	
CN and HK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Other Asian	584	66	8	5	308	298	4	309	198	7	48	2	16	0	1	1 531	
Oceania	1 194	75	2	1	3 187	3 032	25	1 516	1 271	29	124	3	129	8	7	6 568	
IL and ZA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Med. Countries	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

^a Not including Argentina^b Not including Taiwan^c Not including Philippines

Table A.7.5: Total Imports and Exports in High-Tech Products between Country Groups

Million ECU (continued)

Imports 1985

"Declaring Countries"	Partner countries																
	EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World	
EU 15	88 900	6 415	869	596	41 817	39 208	290	27 234	17 489	5 623	4 666	384	364	810	1 586	191 412	
EFTA	8 440	65	32	10	2 195	2 052	16	895	625	135	167	9	11	94	90	12 349	
CEFTA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Other Europe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NAFTA	20 450	1 344	92	341	31 934	17 408	313	57 096	34 290	15 146	7 094	164	259	875	952	146 269	
of which US	17 988	1 157	77	322	14 094	-	269	52 611	31 375	14 206	6 585	147	210	796	884	117 944	
Other American	2 181	216	28	4	4 295	3 947	250	1 009	701	98	158	11	20	64	48	8 765	
DAE ^a	10 557	758	20	60	31 419	30 725	87	22 502	13 069	13 148	4 407	154	368	318	418	89 085	
of which JP	6 096	388	8	15	17 133	16 836	78	6 069	-	3 391	1 739	13	136	102	86	37 996	
ASEAN-4	5 839	393	9	31	9 472	9 336	29	11 943	7 333	1 605	1 033	70	150	49	67	32 016	
CN and HK	6 242	299	12	122	6 459	5 999	7	14 628	9 409	1 661	6 435	76	243	90	86	39 786	
Other Asian	771	103	7	21	602	585	3	418	216	58	202	7	21	5	9	2 342	
Oceania	1 996	118	4	2	3 860	3 524	23	2 248	1 287	304	456	5	230	40	37	9 969	
IL and ZA	2 533	208	2	11	1 998	1 897	10	508	246	33	169	7	39	27	30	5 967	
Med. Countries																	

^a Not including Taiwan**Exports 1985**

"Declaring Countries"	Partner countries																
	EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World	
EU 15	70 345	6 446	1 361	4 040	19 272	17 137	1 575	4 121	2 194	2 045	2 312	1 562	2 037	2 039	5 217	139 795	
EFTA	3 978	77	129	342	873	760	144	344	251	89	188	104	91	122	298	7 427	
CEFTA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Other Europe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
NAFTA	19 517	1 155	52	442	11 898	2 255	1 808	8 548	5 442	1 268	1 959	679	2 257	1 389	1 745	61 846	
of which US	19 106	1 128	46	313	9 631	-	1 744	8 463	5 407	1 244	1 904	621	2 186	1 379	1 609	56 790	
Other American	245	13	0	4	467	396	130	182	158	25	7	4	64	9	103	1 959	
DAE ^a	12 097	655	58	645	30 655	29 041	457	4 811	847	2 778	4 711	590	1 760	272	544	64 583	
of which JP	10 498	610	52	636	25 192	23 716	444	3 849	-	1 584	4 168	469	1 612	269	523	53 933	
ASEAN-4	673	8	0	0	1 974	1 953	3	1 046	273	154	139	12	37	0	8	4 120	
CN and HK	711	20	1	3	1 980	1 868	10	177	67	79	407	4	74	18	20	3 834	
Other Asian	87	7	2	204	47	44	0	20	5	12	4	0	3	0	8	484	
Oceania	98	5	1	3	144	132	4	36	11	34	25	4	138	7	2	562	
IL and ZA	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Med. Countries ^b	408	31	1	5	491	478	16	50	20	10	9	4	14	20	30	1 725	

^a Not including Taiwan^b Not including Albania

Table A.7.5: Total Imports and Exports in High-Tech Products between Country Groups

Million ECU (continued)

Exports 1990

“Declaring Countries”	Partner countries																	
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World	
EU 15		72 916	5 261	1 149	2 345	15 922	14 137	1 131	4 504	2 418	2 016	1 498	1 138	1 105	938	3 421	125 209	
EFTA		5 207	68	123	311	828	700	121	523	387	140	146	70	99	111	243	8 491	
CEFTA		
Other Europe		
NAFTA		28 777	1 424	133	552	17 379	6 329	2 061	14 190	9 069	3 948	2 379	549	2 603	1 033	1 974	81 421	
of which US		27 589	1 391	127	529	10 941	-	1 934	14 005	8 977	3 807	2 261	538	2 503	1 016	1 889	72 653	
Other American a		203	8	0	1	516	478	42	41	38	4	3	4	15	2	1	1 016	
DAE b		18 313	780	226	532	30 077	28 522	452	7 653	1 839	3 914	4 407	384	1 407	216	414	72 771	
of which JP		14 298	596	171	388	21 221	19 982	394	5 001	-	2 216	3 259	219	1 111	176	295	52 387	
ASEAN-4 c		1 038	16	8	4	2 871	2 824	7	2 424	648	192	451	14	13	0	3	7 246	
CN and HK		
Other Asian		78	5	4	122	42	40	1	41	4	17	9	2	4	0	8	394	
Oceania		111	7	1	2	130	122	3	69	35	60	37	7	114	4	4	608	
IL and ZA		
Med. Countries		

a Not including Argentina

b Not including Taiwan

c Not including Philippines

Exports 1995

“Declaring Countries”	Partner countries																	
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World	
EU 15		105 760	8 349	3 615	3 733	22 301	20 237	2 427	8 944	4 961	5 652	5 770	1 188	1 683	2 093	4 786	193 871	
EFTA		6 812	61	194	251	1 338	1 189	179	608	365	354	265	109	112	194	289	11 246	
CEFTA		
Other Europe		
NAFTA		30 787	1 431	351	963	33 365	16 655	4 045	22 249	11 779	7 777	5 477	590	2 425	1 603	2 361	121 194	
of which US		29 028	1 297	334	922	16 476	-	3 701	21 848	11 638	7 632	5 113	565	2 233	1 543	2 307	100 175	
Other American		241	10	4	2	426	385	275	75	62	7	9	2	3	5	13	1 314	
DAE a		28 419	690	180	986	52 594	50 271	958	21 976	6 422	16 782	13 104	772	2 163	476	678	149 388	
of which JP		17 234	390	95	327	30 858	29 278	607	12 145	-	8 290	7 816	314	1 041	245	308	85 573	
ASEAN-4		5 076	48	52	40	10 619	10 268	99	10 610	2 941	910	1 371	86	208	38	30	30 335	
CN and HK		2 519	47	21	48	3 231	3 054	60	3 346	1 693	392	3 369	181	167	48	70	14 408	
Other Asian		320	9	2	52	159	147	14	140	11	73	73	8	11	16	27	1 035	
Oceania		238	16	3	4	238	208	16	292	106	134	227	21	250	33	7	1 606	
IL and ZA		679	56	47	49	746	712	97	267	79	165	71	14	46	25	21	2 596	
Med. Countries		

a Not including Taiwan

Source: UN COMTRADE database

Table A.8.1: Technology Balance of Payments (TBP) - Receipts

Million ECU

	1985	1990	1991	1992	1993	1994	1995
European Union (EU)							
B	891	1 485	1 573	1 844	2 137	2 348	2 282
DK	243	..	..	..	..	..	..
D <i>ab</i>	1 549	4 989	5 083	5 639	6 154	6 638	7 581
EL	..	..	..	..	..	..	..
E	181	315	518	611	765	79	61
F	1 182	1 493	1 409	1 555	..	..	..
IRL	..	..	..	..	..	..	..
I	190	555	1 141	1 024	803	863	923
L	..	..	..	..	..	..	..
NL	1 581	3 315	3 945	4 799	..	..	..
A	39	71	64	95	101	109	102
P	5	..	..	..	..	..	..
FIN	6	34	..	..	..	..	..
S	115	..	176	..	339	..	..
UK <i>c</i>	1 374	1 628	1 887	2 439	2 528	3 140	3 225
European Free Trade Association (EFTA)							
NO	37	103	94	94	..	..	..
Central European Free Trade Association (CEFTA)							
PL	..	..	..	..	..	122	148
North American Free Trade Association (NAFTA)							
CA	523	665	749	707	861	..	..
MX	..	..	63	66	83	82	91
US <i>d</i>	8 584	13 065	14 618	15 419	17 623	18 901	..
Developed Asian Economies							
JP	1 297	1 848	2 226	2 300	3 076	3 812	4 569
TW	..	23	..	65	41	26	..
Oceania							
AU	..	82	..	79	..	139	..
NZ	..	17	17	..	..	..	..

Notes

a Break in series because of unification.

b Until 1985 inclusive, the TBP data for Germany cover transactions concerning patents, licences, trademarks, models and designs.

As from 1986, this data also covers technical services and industrial R&D.

c Oil company operations have been included in the United Kingdom TBP data as from 1984.

d The United States TBP data cover only "royalties and licence fees" which are internationally more comparable.

Transactions concerning "other private services" have been excluded.

Source: OECD, except Taiwan from national source

Second European Report on S&T Indicators, 1997

Table A.8.2: Technology Balance of Payments (TBP) - Payments

Million ECU

	1985	1990	1991	1992	1993	1994	1995
European Union (EU)							
B	1 033	1 987	1 925	2 057	2 314	2 498	2 355
DK	213	..	..	..	..	..	..
D ^{ab}	2 182	5 466	6 457	7 819	8 782	8 619	9 727
EL	11	..	..	..	..	..	..
E	726	1 716	1 841	2 450	1 647	..	849
F	1 406	1 975	1 983	2 158	..	..	..
IRL	..	..	..	..	..	..	..
I	720	965	1 914	1 858	1 403	1 497	1 195
L	..	..	..	..	..	..	..
NL	1 988	3 195	4 800	4 745	..	..	..
A	150	224	244	324	357	383	407
P	44	..	..	..	..	..	..
FIN	141	242	..	..	..	..	..
S	65	..	94	..	38	..	..
UK ^c	1 221	2 152	1 862	2 255	2 265	2 674	2 699
European Free Trade Association (EFTA)							
NO	101	117	136	141	..	..	..
Central European Free Trade Association (CEFTA)							
PL	..	..	..	..	..	111	156
North American Free Trade Association (NAFTA)							
CA	721	665	749	658	701	..	..
MX	..	..	338	363	429	498	374
US ^d	1 527	2 462	3 256	3 909	4 153	4 773	..
Developed Asian Economies							
JP	1 624	2 025	2 370	2 521	2 789	3 058	3 184
TW	..	359	..	420	443	462	..
Oceania							
AU	..	229	..	259	..	268	..
NZ	..	16	13	6	6	..	..

Notes

^a Break in series because of unification.

^b Until 1985 inclusive, the TBP data for Germany cover transactions concerning patents, licences, trademarks, models and designs.

As from 1986, this data also covers technical services and industrial R&D.

^c Oil company operations have been included in the United Kingdom TBP data as from 1984.

^d The United States TBP data cover only "royalties and licence fees" which are internationally more comparable.

Transactions concerning "other private services" have been excluded.

Source: OECD, except Taiwan from national source

Second European Report on S&T Indicators, 1997

Table A.9.1: General Information on Innovation

		Percentage of enterprises considering the following factors as important barriers to innovation										Percentage of innovators considering the following sources of information for innovation as important					Proportion of innovators considering the following objectives of innovation as important				
	Sample size	Estimated population size	Percentage of innovators	Percentage of innovators which perform R&D	Share of innovation expenditure attributable to R&D	Excessive perceived risk	Lack of appropriate sources of finance	Innovation costs too high	Pay-off period of innovation too long	Innovation too easy to copy	Information from within the enterprise	Suppliers of materials and components	Suppliers of equipment	Clients or customers	Fairs/exhibitions	Extend product range	Within main product field	Increasing or maintaining market share	Reducing the share of wage costs	Reducing production lead times	Improving product quality
BELGIUM																					
Size-class																					
	255	4 758	56%	73%	26%	20%	20%	33%	16%	63%	51%	56%	55%	47%	70%	81%	67%	48%	88%		
	103	485	77%	89%	49%	27%	25%	37%	13%	69%	38%	43%	61%	45%	74%	83%	69%	48%	89%		
	242	716	89%	92%	62%	25%	22%	35%	10%	71%	51%	46%	65%	36%	73%	83%	70%	53%	88%		
Industrial sector																					
	1	16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	19	95	100%	100%	78%	31%	81%	54%	5%	94%	34%	17%	87%	41%	100%	88%	47%	38%	73%		
	6	72	100%	58%	81%	0%	14%	13%	0%	54%	86%	83%	93%	88%	86%	93%	58%	58%	100%		
	74	382	67%	91%	80%	18%	9%	27%	11%	69%	38%	24%	49%	29%	81%	84%	67%	51%	97%		
	29	192	42%	84%	60%	26%	30%	38%	21%	54%	60%	53%	50%	26%	70%	74%	43%	43%	74%		
	16	68	64%	92%	52%	28%	13%	49%	0%	80%	100%	40%	72%	16%	40%	52%	84%	44%	100%		
	10	72	62%	53%	55%	32%	20%	39%	29%	83%	29%	22%	29%	49%	44%	87%	63%	19%	100%		
	600	5 959	61%	78%	54%	21%	20%	34%	15%	65%	50%	53%	57%	45%	71%	82%	68%	49%	88%		
GERMANY																					
Size-class																					
	761	32 704	63%	56%	7%	29%	35%	37%	31%	57%	63%	50%	75%	67%	79%	89%	70%	..	82%		
	432	10 956	69%	75%	15%	30%	25%	37%	34%	57%	53%	41%	75%	63%	57%	87%	70%	..	84%		
	801	6 200	85%	92%	35%	37%	27%	38%	35%	56%	59%	45%	81%	66%	71%	92%	73%	..	83%		
Industrial sector																					
	31	439	72%	94%	43%	25%	32%	20%	38%	64%	41%	26%	95%	47%	61%	98%	58%	..	93%		
	57	437	91%	98%	36%	57%	29%	46%	37%	36%	49%	27%	99%	64%	53%	96%	72%	..	63%		
	155	3 443	84%	93%	37%	49%	40%	52%	25%	75%	63%	37%	86%	77%	81%	93%	63%	..	90%		
	151	1 648	85%	92%	49%	23%	10%	25%	15%	70%	77%	33%	82%	58%	72%	78%	63%	..	89%		
	86	1 570	70%	67%	32%	33%	30%	30%	28%	33%	33%	26%	50%	47%	60%	77%	60%	..	61%		
	88	876	76%	86%	37%	38%	48%	56%	51%	58%	81%	61%	90%	68%	72%	86%	75%	..	93%		
	48	373	61%	82%	59%	27%	31%	53%	20%	62%	71%	57%	85%	84%	74%	98%	66%	..	95%		
	1 994	49 860	67%	66%	27%	30%	32%	37%	32%	57%	60%	47%	76%	66%	73%	89%	71%	..	83%		

Table A.9.1: General Information on Innovation
(continued)

		Percentage of enterprises considering the following factors as important barriers to innovation										Percentage of innovators considering the following sources of information for innovation as important						Proportion of innovators considering the following objectives of innovation as important				
	Sample size	Estimated population size	Percentage of innovators	Percentage of innovators which perform R&D	Share of innovation expenditure attributable to R&D	Excessive perceived risk	Lack of appropriate sources of finance	Innovation costs too high	Pay-off period of innovation too long	Innovation too easy to copy	Information from within the enterprise	Suppliers of materials and components	Suppliers of equipment	Clients or customers	Fairs/exhibitions	Extend product range	Within main product field	Increasing or maintaining market share	Reducing the share of wage costs	Reducing production lead times	Improving product quality	
FRANCE																						
Size-class																						
	2 403	16 941	34%	66%							22%	19%	22%	22%	22%	57%	33%	19%		53%		
20-99		3 750	45%	77%						37%	21%	20%	22%	22%	19%	60%	37%	23%		59%		
100-249		2 095	69%	92%						57%	22%	24%	24%	18%	64%	48%	37%	37%		63%		
250+																						
Industrial sector																						
Computers and Office Machinery	13	89	72%	83%						45%	19%	19%	38%	19%	91%	27%	21%			59%		
Electronics	75	501	55%	88%						39%	16%	16%	23%	14%	57%	45%	27%			70%		
Instruments	162	930	63%	83%						46%	11%	13%	28%	15%	75%	46%	24%			57%		
Chemicals and Pharmaceuticals	233	1 153	60%	85%						39%	15%	10%	16%	10%	73%	36%	16%			55%		
Electrical Machinery	146	818	60%	82%						47%	23%	18%	30%	22%	72%	52%	35%			61%		
Motor Vehicles	98	562	48%	93%						39%	22%	23%	25%	19%	54%	46%	25%			67%		
Other Transport Equipment	65	315	57%	79%						30%	30%	21%	19%	16%	73%	50%	13%			69%		
Total	3 713	22 785	39%	72%						30%	20%	22%	23%	21%	59%	36%	23%			56%		
In the French questionnaire, there is no distinction between extending the product range 'Within main product field' and 'Outside main product field'																						
ITALY																						
Size-class																						
	17 233	26 850	30%	50%	34%	20%	43%	46%	37%	21%	58%	32%	37%	45%	52%	80%	65%	65%	69%	86%		
20-99		3 428	48%	72%	40%	12%	36%	40%	35%	18%	75%	32%	33%	45%	62%	85%	70%	70%	70%	88%		
100-249		1 587	69%	86%	69%	11%	31%	37%	37%	16%	83%	32%	31%	39%	65%	87%	69%	69%	66%	89%		
250+																						
Industrial sector																						
Computers and Office Machinery	46	76	60%	92%	74%	19%	47%	40%	36%	19%	85%	25%	14%	46%	91%	98%	61%			90%		
Electronics	233	367	60%	82%	71%	18%	48%	41%	37%	14%	83%	35%	31%	59%	70%	89%	68%			83%		
Instruments	404	635	52%	81%	66%	19%	49%	43%	37%	22%	79%	31%	18%	57%	67%	84%	62%			86%		
Chemicals and Pharmaceuticals	766	1 063	49%	81%	79%	13%	33%	41%	36%	18%	77%	29%	23%	37%	67%	86%	55%			85%		
Electrical Machinery	934	1 378	39%	72%	51%	15%	41%	40%	38%	20%	72%	31%	35%	52%	61%	86%	70%			90%		
Motor Vehicles	423	623	46%	73%	86%	19%	47%	46%	41%	22%	69%	32%	38%	50%	60%	81%	65%			91%		
Other Transport Equipment	284	405	37%	65%	47%	20%	50%	46%	43%	15%	72%	30%	27%	46%	65%	86%	66%			91%		
Total	#####	#####	34%	57%	61%	18%	41%	45%	37%	20%	63%	32%	36%	45%	55%	82%	66%			86%		

Table A.9.1: General Information on Innovation
(continued)

IRELAND	Sample size	Percentage of enterprises considering the following factors as important barriers to innovation										Percentage of innovators considering the following sources of information for innovation as important					Proportion of innovators considering the following objectives of innovation as important				
		Estimated population size	Percentage of innovators	Percentage of innovators which perform R&D	Share of innovation expenditure attributable to R&D	Excessive perceived risk	Lack of appropriate sources of finance	Innovation costs too high	Pay-off period of innovation too long	Innovation too easy to copy	Information from within the enterprise	Suppliers of materials and components	Suppliers of equipment	Clients or customers	Fairs/exhibitions	Extend product range	within main product field	Increasing or maintaining market share	Reducing the share of wage costs	Reducing production lead times	Improving product quality
Size-class																					
20-99	515	1 666	70%	86%	31%	27%	35%	28%	20%	64%	45%	40%	68%	50%	69%	75%	51%	50%	50%	84%	
100-249	151	312	72%	81%	26%	17%	23%	21%	10%	71%	53%	42%	75%	43%	78%	77%	59%	60%	60%	89%	
250+	96	201	87%	90%	29%	26%	28%	35%	8%	68%	35%	48%	60%	27%	74%	86%	60%	67%	67%	85%	
Industrial sector																					
Computers and Office Machinery	18	41	88%	75%	13%	5%	19%	35%	6%	76%	46%	16%	81%	22%	63%	82%	35%	54%	54%	71%	
Electronics	29	69	76%	85%	41%	40%	59%	39%	9%	69%	40%	27%	79%	34%	81%	92%	49%	68%	68%	85%	
Instruments	39	96	73%	97%	40%	20%	23%	31%	5%	82%	40%	25%	85%	43%	85%	91%	52%	82%	82%	84%	
Chemicals and Pharmaceuticals	87	155	76%	92%	56%	22%	21%	28%	9%	73%	32%	20%	67%	39%	75%	80%	33%	50%	50%	95%	
Electrical Machinery	35	79	85%	87%	33%	21%	23%	35%	15%	63%	44%	54%	74%	46%	71%	73%	44%	47%	47%	72%	
Motor Vehicles	14	75	74%	67%	12%	34%	34%	34%	28%	63%	37%	51%	72%	33%	65%	96%	67%	44%	44%	91%	
Other Transport Equipment	5	23	100%	86%	31%	14%	14%	22%	0%	78%	9%	14%	86%	14%	36%	91%	22%	14%	14%	22%	
Total	762	2 179	72%	86%	29%	26%	32%	28%	17%	65%	45%	41%	68%	47%	71%	77%	53%	53%	53%	85%	
LUXEMBOURG																					
Size-class																					
20-99	87	121	31%	57%	47%	19%	16%	5%	3%	67%	38%	42%	60%	55%	70%	80%	35%	56%	56%	79%	
100-249	24	31	40%	82%	60%	3%	9%	5%	3%	69%	56%	61%	73%	65%	74%	100%	42%	61%	61%	92%	
250+	19	19	68%	94%	41%	16%	14%	18%	18%	76%	42%	66%	79%	5%	83%	87%	76%	72%	72%	100%	
Industrial sector																					
Computers and Office Machinery	1	1
Electronics	2	7
Instruments	6	4
Chemicals and Pharmaceuticals	5	10	18%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Electrical Machinery	2	5
Total	130	171	37%	70%	44%	16%	7%	14%	5%	69%	42%	51%	66%	46%	74%	85%	45%	60%	60%	86%	

Table A.9.1: General Information on Innovation
(continued)

Sample size	Estimated population size	Percentage of innovators which perform R&D	Percentage of innovators	Percentage of enterprises considering the following factors as important barriers to innovation							Percentage of innovators considering the following sources of information for innovation as important							Proportion of innovators considering the following objectives of innovation as important				
				Excessive perceived risk	Lack of appropriate sources of finance	Innovation costs too high	Pay-off period of innovation too long	Innovation too easy to copy	Information from within the enterprise	Suppliers of materials and components	Suppliers of equipment	Clients or customers	Fairs/exhibitions	Extend product range	Within main product field	Increasing or maintaining market share	Reducing the share of wage costs	Reducing production lead times	Improving product quality			
NETHERLANDS																						
Size-class																						
20-99	1 011	5367	51%	58%	41%	:	:	:	:	48%	44%	39%	60%	36%	58%	68%	55%	42%	80%			
100-249	478	908	76%	76%	51%	:	:	:	:	57%	45%	41%	68%	36%	70%	83%	53%	43%	83%			
250+	302	475	84%	87%	60%	:	:	:	:	60%	50%	46%	67%	29%	70%	86%	62%	40%	85%			
Industrial sector																						
Computers and Office Machinery	16	38	54%	58%	11%	:	:	:	:	59%	33%	37%	69%	62%	64%	61%	44%	50%	91%			
Electronics	11	34	93%	59%	76%	:	:	:	:	74%	89%	50%	59%	19%	100%	100%	59%	74%	100%			
Instruments	66	278	75%	81%	61%	:	:	:	:	65%	43%	18%	67%	45%	56%	66%	48%	33%	80%			
Chemicals and Pharmaceuticals	199	527	81%	72%	68%	:	:	:	:	62%	46%	36%	58%	36%	73%	76%	56%	32%	84%			
Electrical Machinery	49	129	70%	73%	62%	:	:	:	:	61%	38%	16%	74%	32%	79%	93%	74%	41%	86%			
Motor Vehicles	29	72	90%	75%	72%	:	:	:	:	25%	34%	15%	88%	61%	84%	92%	63%	53%	96%			
Other Transport Equipment	69	291	49%	64%	50%	:	:	:	:	29%	44%	39%	53%	28%	74%	83%	40%	38%	75%			
Total	1 791	6 749	57%	65%	56%	:	:	:	:	51%	45%	40%	62%	35%	61%	73%	55%	42%	81%			

In the Dutch questionnaire 'Reducing production lead times' has been phrased 'Reducing unit costs by reducing the preparatory period'

NORWAY**Size-class**

20-99	282	774	46%	62%	36%	31%	25%	37%	22%	10%	46%	44%	65%	37%	47%	76%	51%	73%	71%
100-249	130	199	63%	64%	36%	25%	20%	31%	21%	4%	54%	49%	56%	41%	45%	72%	51%	58%	69%
250+	88	108	82%	70%	66%	26%	19%	29%	19%	8%	59%	33%	54%	36%	45%	74%	59%	64%	70%

Industrial sector

Computers and Office Machinery	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Electronics	9	11	77%	100%	60%	50%	64%	27%	23%	14%	88%	12%	76%	41%	76%	100%	24%	53%	71%
Instruments	4	6	83%	100%	29%	33%	0%	17%	17%	0%	80%	0%	80%	40%	100%	100%	0%	100%	40%
Chemicals and Pharmaceuticals	19	36	94%	97%	90%	31%	19%	28%	15%	0%	30%	9%	66%	15%	81%	94%	50%	39%	62%
Electrical Machinery	16	19	68%	77%	51%	21%	16%	32%	37%	5%	69%	54%	54%	54%	54%	85%	62%	85%	69%
Motor Vehicles	8	9	82%	100%	22%	65%	29%	41%	29%	0%	43%	29%	100%	43%	71%	71%	57%	86%	71%
Other Transport Equipment	57	103	42%	76%	70%	27%	27%	44%	27%	11%	52%	32%	88%	50%	44%	68%	45%	71%	53%
Total	500	1 081	53%	64%	55%	30%	24%	35%	21%	9%	49%	43%	61%	38%	46%	75%	52%	68%	70%

Source: Eurostat - Community Innovation Survey

Table A.9.2: Sources of Information for Innovation

Ranking according to their perceived importance (1=most important)

	Information coming from within the enterprise	Suppliers of materials and components	Suppliers of equipment	Clients or customers	Competitors in your line of business	Consultancy firms	Universities/higher education	Government laboratories	Technical institutes	Patent disclosures	Professional conferences, meetings, prof. journals ^a	Fairs/exhibitions
Belgium	1	5	3	2	7	12	8	11	9	10	6	4
Denmark	2	3	4	1	5	11	10	9	8	12	7	6
Germany	6	4	7	1	5	10	8	12	11	9	3	2
Spain <i>bcde</i>	5	8	3	2	1	7	11	12	9	10	6	4
France	1	5	4	3	7	12	11	10	8	9	6	2
Ireland	2	5	6	1	4	10	9	12	8	11	7	3
Italy <i>f</i>	1	5	3	2	6	8	10	11	12	9	7	4
Luxembourg	2	5	3	1	7	8	9	12	11	10	6	4
Netherlands	2	3	4	1	6	9	10	8	12	11	7	5
Norway	2	5	3	1	7	11	9	10	8	12	6	4

Notes*This question was answered by innovators only**a* Two different categories have been merged together to create 'Professional conferences, meetings, professional journals'.

These two categories are:

- scientific and technological publications
- competitors publications

b In the Spanish questionnaire, two different categories have been merged together to create 'Clients or customers'. These two categories are:

- customer demand
- co-operation with clients

c 'Suppliers of materials and components' has been phrased: 'Co-operation with subcontractors and other companies'*d* 'Suppliers of equipment' has been phrased as 'Technological equipment'*e* 'Use of consultancy services' has been phrased as 'Services with technological content'*f* 'Clients or customers' as a source of information for innovation is phrased as 'Clients' only**Source: Eurostat - Community Innovation Survey****Second European Report on S&T Indicators, 1997**

Table A.9.3: Objectives of Innovation

Ranking according to their perceived importance (1=most important)

	Replace products being phased out	Extend product range within main product field	Extend product range outside main product field	Increasing or maintaining market share	Creating new markets nationally	Creating new markets within the E.C.	Creating new markets in North America	Creating new markets in Japan	Creating new markets in other countries	Improve production flexibility	Reducing the share of wage costs	Reducing materials consumption	Reducing energy consumption	Reducing product design costs	Reducing production lead times	Reducing environmental damage	Improving product quality	Improving working conditions/safety
Belgium	11	4	15	2	8	5	17	18	14	6	3	10	13	16	9	12	1	7
Denmark	10	4	14	2	9	6	16	17	..	7	5	8	13	15	3	12	1	11
Germany	7	4	13	1	6	10	15	16	14	5	3	8	11	..	..	12	2	9
Spain	10	5	11	1	3	..	..	..	..	2	6	8	9	12	..	7	..	4
France abc	12	2	2	4	8	8	8	8	8	5	14	16	17	13	..	15	3	11
Ireland	11	3	14	2	10	4	17	18	16	8	6	9	12	15	7	13	1	5
Italy d	13	7	16	2	8	9	15	18	17	6	4	10	12	14	3	11	1	5
Luxembourg	13	3	16	2	12	4	17	18	14	7	8	10	11	15	6	9	1	5
Netherlands ef	10	3	14	2	7	8	17	18	16	5	4	9	13	15	12	11	1	6
Norway gh	12	6	16	1	9	11	..	..	14	8	4	5	13	15	3	10	2	7

Notes*This question was answered by innovators only**a* There is no distinction between extending the product range 'Within main product field' and 'Outside main product field'.

The question has been phrased as 'Extending the range of products'

b There is no geographical breakdown in national, EC, North America, Japan and other countries for creating new markets.

The question has simply been phrased as 'Turning to new geographical markets'

c 'Reducing product design costs' as an objective of innovation has been phrased as 'Reducing the product design cycle'*d* 'Increasing or maintaining market share in North America' has been phrased as 'USA'. Hence Canada and Mexico are not included*e* 'Creating new markets in North America' has been phrased as 'Penetrating new markets in the United States'. Hence Canada and Mexico are not included*f* 'Lower production costs by reducing production lead times' has been phrased as 'Reducing unit costs by reducing the preparatory period'*g* 'Creating new markets within the European Community' has been phrased as 'With the European Community excluding Denmark'*h* 'Creating new markets in other countries' includes North America**Source: Eurostat - Community Innovation Survey****Second European Report on S&T Indicators, 1997**

Table A.9.4: Factors Hampering Innovation

Ranking according to their perceived importance (1=most important)

	Excessive perceived risk	Lack of appropriate sources of finance	Innovation costs too high	Pay-off period of innovation too long	Enterprise's innovation potential too small	Lack of skilled personnel	Lack of information on technologies	Lack of information on markets	Innovation costs hard to control	Resistance to change in the enterprise	Deficiencies in the availability of external technical services	Lack of opportunities for co-operation with other firms and technological institutions	Lack of technological opportunities	No need to innovate due to earlier innovation	Innovation too easy to copy	Legislation, norms, regulations, standards, taxation	Lack of customer responsiveness to new products and processes	Uncertainty in timing of innovation
Belgium	3	5	1	2	6	7	11	8	4	16	17	14	9	18	10	15	12	13
Denmark	3	4	2	1	5	6	9	7	10	15	18	17	12	16	13	11	8	14
Germany	2	3	1	5	..	7	15	12	6	16	11	13	9	..	4	8	10	14
Spain	5	2	1	3	6	4	9	10	12	14	8	8	18	17	11	15	13	16
France <i>a</i>	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ireland	5	3	1	2	4	7	8	6	9	16	14	11	10	18	15	13	12	17
Italy	7	2	1	3	11	5	16	13	9	15	14	10	17	18	6	4	12	8
Luxembourg	2	3	1	4	7	6	16	14	12	13	18	17	11	5	15	9	8	10
Netherlands <i>b</i>	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Norway	4	6	2	5	1	3	10	8	7	13	17	16	9	15	14	18	12	11

Notes*This question was answered by innovators and non-innovators**a* The barrier question was not in the French questionnaire*b* The Dutch questionnaire was restricted to innovators**Source: Eurostat - Community Innovation Survey****Second European Report on S&T Indicators, 1997**

Table A.10.1: Trends in Community Commitments for RTD, 1984-1998
Million 1992 ECU

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997 a	1998 b	TOTAL
1984-87 FP	848	992	1 140	886	318	117	5									4 306
1987-91 FP				238	987	1 438	1 770	1 339	231	15	4	0				6 022
1990-94 FP								312	2 161	1 901	1 224	1				5 599
Support finance 90-94 FP										148	726					874
1994-98 FP c											0	2 888	2 959	3 074	3 087	12 008
RTD PROGRAMMES	848	992	1 140	1 124	1 305	1 556	1 776	1 651	2 391	2 063	1 954	2 889	2 959	3 074	3 087	28 808
APAS				62	69	81	125	178	308	434	554	2				1 813
RTD+APAS	848	992	1 140	1 186	1 374	1 636	1 901	1 829	2 700	2 497	2 508	2 891	2 959	3 074	3 087	30 621
SPRINT							18	17	17							52
ECSC							19	18	18	17	17					89
80% of THERMIE							40	125	129	137	141					572
TOTAL FOR ALL RESEARCH d	848	992	1 140	1 186	1 374	1 636	1 978	1 989	2 863	2 651	2 665	2 891	2 959	3 074	3 087	31 334
				5 540			8 163			12 147						
																14 676
EC BUDGET (1992 prices)	41 352	40 385	46 730	48 475	52 473	49 327	49 952	59 126	61 232	66 759	63 823	72 110	78 645	79 250	81 537	
Total research as % of budget	2.10	2.50	2.40	2.40	2.60	3.30	4.00	3.40	4.70	4.00	4.20	4.00	3.80	3.90	3.80	
Deflators e	0.70	0.74	0.77	0.79	0.82	0.86	0.90	0.95	1.00	1.02	1.03	1.05	1.08	1.11	1.13	
Annual inflation (%)	..	6.00	3.50	3.30	3.60	5.10	4.50	5.20	3.50	1.50	1.80	1.20	3.50	2.20	1.80	

Notes

a Budget for 1997

b Estimate for 1998

c The amounts of the 1994-1998 FP are those adopted following EU enlargement

d RTD + THERMIE + ECSC + SPRINT + APAS

e The deflators used from 1995 take account of enlargement from 12 to 15 Member States (COM(96)65)

Data: European Commission Services

Source: Second European Report on S&T Indicators, 1997

Table A.10.2: Changes in RTD Priorities between Framework Programme

Homogeneous groups	1982	1st F.P. 1984-1987	2nd F.P. 1987-1991	3rd F.P. 1990-1994	4th F.P. 1994-1998
Total Amount (MECU)	500	3 750	5 396	6 600	13 100
Total (%)	100	100	100	100	100
Information and Communications Technologies	10	25	42	38	28
Industrial and Materials Technologies	9	11	16	15	16
Environment	9	7	6	9	9
Life Sciences and Technologies	3	5	7	10	13
Energy	66	50	22	16	18
Transport	0	0	0	0	2
Socio-Economic Research	0	0	0	0	1
International Cooperation	0	0	2	2	4
Dissemination and Exploitation of Results	0	0	1	1	3
Human Capital and Mobility	3	2	4	9	6

Data: European Commission Services

Source: Second European Report on S&T Indicators, 1997

Table A.10.3: Third Framework Programme Projects - Shared Cost Actions a

Summary by Specific Programme

Geographical coverage: EUR15

	Number of Projects Funded	Number of Participations	Average Number of Participations per Project	European Commission Funding (in 1000 ECU)		Average Number of Different Member States per Project
				Total	Average per Project	
Third Framework Programme - Global	3 292	18 360	5.6	4 008 186	1 218	3.5
Information Technology	495	3 833	7.7	1 340 357	2 708	4.3
Communications Technology	123	1 302	10.6	519 804	4 226	5.3
Telematics Systems in Areas of General Interest <i>b</i>	248	1 612	6.5	354 335	1 429	4.1
Industrial and Materials Technologies (not including Aeronautics)	447	2 624	5.9	603 449	1 350	3.5
Aeronautics	30	414	13.8	62 031	2 068	6.8
Measurement and Testing	175	492	2.8	55 171	315	2.2
Environment	554	2 744	5.0	299 175	540	3.5
Marine S&T	93	619	6.7	101 616	1 093	3.8
Biotechnology	140	796	5.7	154 623	1 104	3.6
Biomedicine and Health	41	152	3.7	24 005	585	2.8
Agriculture and Agro-Industry (including Fisheries) <i>c</i>	92	463	5.0	118 112	1 284	3.6
Non-Nuclear Energies	397	1 856	4.7	239 527	603	3.2
Nuclear Fission Safety	149	727	4.9	60 770	408	3.4
Life Sciences and Technologies for Developing Countries	308	726	2.4	75 211	244	2.1

Notes

Data in respect of cooperative research projects and feasibility awards are not included.

a Data on FUSION, HUMAN CAPITAL AND MOBILITY and BIOMEDICINE AND HEALTH (part) are not included in this table due to the special nature of these programmes.*b* TELEMATICS SYSTEMS IN AREAS OF GENERAL INTEREST: most data are estimates.*c* Some data on agriculture are not included due to unavailability.**Data: European Commission Services****Source: Second European Report on S&T Indicators, 1997**

Table A.10.4: Fourth Framework Programme Projects - Shared Cost Actions ^a

Summary by Specific Programme

Geographical coverage: EUR15

	Number of Projects Funded	Number of Participations	Average Number of Participations per Project	European Commission Funding (in 1000 ECU)		Average Number of Different Member States per Project
				Total	Average per Project	
Fourth Framework Programme - Global	2 949	20 674	7.0	3 419 758	1 160	4.2
Information Technologies	386	2 476	6.4	631 217	1 635	4.0
Advanced Communication Technologies and Services	145	1 617	11.2	284 276	1 961	5.4
Telematics Applications of Common Interest	258	3 000	11.6	276 526	1 072	4.7
Transport	115	1 054	9.2	126 868	1 103	5.4
Industrial and Materials Technologies (including Aeronautics)	331	2 641	8.0	588 898	1 779	4.5
Standards. Measurement and Testing	134	793	5.9	71 773	536	4.3
Environment and Climate	308	1 833	6.0	234 560	762	4.1
Marine Sciences and Technologies	56	551	9.8	107 502	1 920	4.7
Biotechnology	190	1 288	6.8	270 997	1 426	4.5
Biomedicine and Health	159	896	5.6	99 510	626	4.0
Agriculture and Agro-Industry (including Fisheries)	259	1 559	6.0	262 161	1 012	4.5
Non-Nuclear Energy - Technologies for Cleaner and more Efficient Energy Production and Use	200	1 227	6.1	198 320	992	3.9
Non-Nuclear Energy - Thermie ^b	94	389	4.1	109 359	1 163	2.8
Nuclear Safety and Safeguards	145	805	5.6	106 501	734	3.8
Cooperation with Third Countries and International Organisations	141	363	2.6	34 267	243	2.2
Targeted Socio-Economic Research	28	182	6.5	17 022	608	5.7

Notes

Data in respect of cooperative research projects and exploratory awards are not included.

^a The data for the Fourth Framework Programme only cover the period 1 January 1994 to 31 December 1996.

Data on FUSION and TRAINING AND MOBILITY OF RESEARCHERS are not included in this table due to the special nature of these programmes.

^b Data for THERMIE refer to 1996 only.**Data: European Commission Services****Source: Second European Report on S&T Indicators, 1997**

Table A.10.5: Third Framework Programme Projects - Shared Cost Actions a

Total Participations for each Specific Programme by Type of Participant

Geographical coverage: EUR15

	BIG	SME	REC	EDU	INO	OTH	TOTAL
Third Framework Programme - Global	3 909	2 663	5 476	5 785	36	491	18 360
Information Technology	1 517	729	693	885	0	9	3 833
Communications Technology	523	302	148	217	5	107	1 302
Telematics Systems in Areas of General Interest b Industrial and Materials Technologies (not including Aeronautics)	356	406	339	350	0	161	1 612
Aeronautics	893	600	526	586	0	19	2 624
Measurement and Testing	168	31	85	127	0	3	414
Environment	24	61	272	114	0	21	492
Marine S&T	69	92	1 176	1 355	17	35	2 744
Biotechnology	17	41	261	290	0	10	619
Biomedicine and Health	33	21	304	425	5	8	796
Agriculture and Agro-Industry (including Fisheries) c	1	5	83	59	3	1	152
Non-Nuclear Energies	20	43	221	157	1	21	463
Nuclear Fission Safety	266	318	623	587	0	62	1 856
Life Sciences and Technologies for Developing Countries	21	8	428	242	4	24	727
	1	6	317	391	1	10	726

Notes

Data in respect of cooperative research projects and feasibility awards are not included.

a Data on FUSION, HUMAN CAPITAL AND MOBILITY and BIOMEDICINE AND HEALTH (part) are not included in this table due to the special nature of these programmes.

b TELEMATICS SYSTEMS IN AREAS OF GENERAL INTEREST: most data are estimates.

c Some data on agriculture are not included due to unavailability.

Definitions of Type of Participant

BIG - Industry > 500 employees

SME - Industry ≤ 500 employees

REC - Public or private research centre

EDU - Higher educational establishment

INO - International organisation

OTH - Others

Data: European Commission Services**Source: Second European Report on S&T Indicators, 1997**

Table A.10.6: Fourth Framework Programme - Shared Cost Actions a

Total Participations for each Specific Programme by Type of Participant

Geographical coverage: EUR15

	BIG	SME	REC	EDU	INO	OTH	TOTAL
Fourth Framework Programme - Global	3 985	3 573	5 184	6 050	215	1 667	20 674
Information Technologies	948	593	322	429	4	180	2 476
Advanced Communication Technologies and Services	547	334	282	318	16	120	1 617
Telematics Applications of Common Interest	488	692	355	613	30	822	3 000
Transport	208	357	138	171	2	178	1 054
Industrial and Materials Technologies (including Aeronautics)	953	646	461	541	10	30	2 641
Standards, Measurement and Testing	117	129	334	165	21	27	793
Environment and Climate	37	59	741	904	43	49	1 833
Marine Sciences and Technologies	12	28	219	269	5	18	551
Biotechnology	90	91	431	628	25	23	1 288
Biomedicine and Health	24	28	260	553	5	26	896
Agriculture and Agro-Industry (including Fisheries)	103	153	646	612	2	43	1 559
Non-Nuclear Energy - Technologies for Cleaner and more Efficient Energy Production and Use	252	218	386	307	13	51	1 227
Non-Nuclear Energy - Thermie <i>b</i>	124	175	19	7	0	64	389
Nuclear Safety and Safeguards	77	56	410	212	34	16	805
Cooperation with Third Countries and International Organisations	4	6	139	202	5	7	363
Targeted Socio-Economic Research	1	8	41	119	0	13	182

Notes

Data in respect of cooperative research projects and exploratory awards are not included.

a The data for the Fourth Framework Programme only cover the period 1 January 1994 to 31 December 1996.

Data on FUSION and TRAINING AND MOBILITY OF RESEARCHERS are not included in this table due to the special nature of these programmes.

b Data for THERMIE refer to 1996 only.**Definitions of Type of Participant**

BIG - Industry > 500 employees

SME - Industry ≤ 500 employees

REC - Public or private research centre

EDU - Higher educational establishment

INO - International organisation

OTH - Others

Data: European Commission Services**Source: Second European Report on S&T Indicators, 1997**

Table A.10.7: Third Framework Programme - Shared Cost Actions a

European Commission Contractual Funding of Projects - % Distribution for each Specific Programme by Type of Participant

Geographical coverage: EUR15

	BIG	SME	REC	EDU	INO	OTH	Total
Third Framework Programme - Global	34.2	16.4	23.5	22.5	0.2	3.2	100
Information Technology	51.4	17.5	17.0	14.0	-	0.1	100
Communications Technology	51.7	21.0	10.2	11.1	0.4	5.5	100
Telematics Systems in Areas of General Interest <i>b</i>	25.3	25.6	19.7	19.5	-	9.9	100
Industrial and Materials Technologies (not including Aeronautics)	37.3	22.4	19.0	20.7	-	0.6	100
Aeronautics	48.6	4.7	22.3	22.2	-	2.2	100
Measurement and Testing	3.6	10.9	55.5	27.0	-	2.9	100
Environment	2.6	3.5	42.1	49.9	0.6	1.3	100
Marine S&T	3.9	6.7	41.1	46.9	-	1.5	100
Biotechnology	2.5	1.4	39.3	53.1	2.6	1.2	100
Biomedicine and Health	0.7	5.1	67.0	24.1	2.8	0.2	100
Agriculture and Agro-Industry (including Fisheries) <i>c</i>	3.0	6.3	32.3	23.4	0.1	34.8	100
Non-Nuclear Energies	17.9	20.8	31.3	26.9	-	3.2	100
Nuclear Fission Safety	3.4	1.1	64.1	26.7	1.1	3.6	100
Life Sciences and Technologies for Developing Countries	0.3	0.4	44.5	54.0	0.1	0.6	100

Notes

Data in respect of cooperative research projects and feasibility awards are not included.

a Data on FUSION, HUMAN CAPITAL AND MOBILITY and BIOMEDICINE AND HEALTH (part) are not included in this table due to the special nature of these programmes.*b* TELEMATICS SYSTEMS IN AREAS OF GENERAL INTEREST: most data are estimates.*c* Some data on agriculture are not included due to unavailability.**Definitions of Type of Participant**

BIG - Industry > 500 employees

SME - Industry ≤ 500 employees

REC - Public or private research centre

EDU - Higher educational establishment

INO - International organisation

OTH - Others

Data: European Commission Services**Source: Second European Report on S&T Indicators, 1997**

Table A.10.8: Fourth Framework Programme Projects - Shared Cost Actions a

European Commission Contractual Funding of Projects - % Distribution for each Specific Programme by Type of Participant

Geographical coverage: EUR15

	BIG	SME	REC	EDU	INO	OTH	Total
Fourth Framework Programme - Global	26.8	16.1	23.9	27.4	0.8	5.1	100
Information Technologies	46.8	22.7	11.8	14.7	0.2	3.8	100
Advanced Communication Technologies and Services	44.6	14.3	18.1	17.4	0.6	5.2	100
Telematics Applications of Common Interest	23.5	23.7	13.6	18.1	0.6	20.5	100
Transport	26.1	27.3	13.3	13.7	0.0	19.5	100
Industrial and Materials Technologies (including Aeronautics)	40.6	22.0	15.7	20.1	0.3	1.3	100
Standards, Measurement and Testing	12.3	16.0	40.4	27.1	1.8	2.4	100
Environment and Climate	1.7	2.8	44.6	47.7	1.7	1.5	100
Marine Sciences and Technologies	2.3	4.4	38.8	51.4	0.5	2.7	100
Biotechnology	4.8	4.3	35.3	51.6	3.1	1.0	100
Biomedicine and Health	1.8	4.3	29.5	61.4	0.7	2.2	100
Agriculture and Agro-Industry (including Fisheries)	4.2	7.8	42.7	43.1	0.1	2.0	100
Non-Nuclear Energy - Technologies for Cleaner and more Efficient Energy Production and Use	26.4	16.7	27.7	24.3	0.7	4.2	100
Non-Nuclear Energy - Thermie b	51.0	32.1	2.3	0.4	-	14.2	100
Nuclear Safety and Safeguards	5.8	6.2	55.0	26.2	5.5	1.2	100
Cooperation with Third Countries and International Organisations	1.1	0.6	39.1	57.4	0.9	1.0	100
Targeted Socio-Economic Research	0.1	3.2	20.9	67.9	-	7.9	100

Notes

Data in respect of cooperative research projects and exploratory awards are not included.

a The data for the Fourth Framework Programme only cover the period 1 January 1994 to 31 December 1996.

Data on FUSION and TRAINING AND MOBILITY OF RESEARCHERS are not included in this table due to the special nature of these programmes.

b Data for THERMIE refer to 1996 only.

Definitions of Type of Participant

BIG - Industry > 500 employees

SME - Industry ≤ 500 employees

REC - Public or private research centre

EDU - Higher educational establishment

INO - International organisation

OTH - Others

Data: European Commission Services**Source: Second European Report on S&T Indicators, 1997**

Table A.10.9: Expenditures of 12 European Collaborative Programmes: 1980-1995

Million ECU

Organisation	R&D Budget 1995	Annual Budget 1995
CERN	595	642
ECMWF	25	..
EISCAT	3	..
COST	502	..
EMBL	57	60
EMBO	8	..
ESA	2 527	2 937
ESF	9 <i>a</i>	13
		18 <i>b</i>
ESO	77	78
ESRF	4	66
EUREKA	2 198	..
ILL	43	48

Notes*italics* Estimation by DG XII-AS-4*a* Budget for R&D coordination activities*b* Total turnover (including optionally funded projects, EMAPS and EURESCO funding)

CERN European Organisation for Nuclear Research

ECMWF European Centre for Medium Range Weather Forecasting

EISCAT European Incoherent Scattering Facility

EMBL European Molecular Biology Laboratory

ESA European Space Agency

ESF European Science Foundation

ESRF European Synchrotron Radiation Facility

ESO European Southern Observatory

ILL Institut Laue-Langevin

Data: 12 EU organisations surveys**Source: DG XII-AS-4, PREST****Second European Report on S&T Indicators, 1997**

Table A.10.11: Inter-Enterprise Alliances: Partnerships between Countries
1992 - 1995

	EUR 15	B	DK	D	FI	FR	IRL	I	NL	P	FIN	S	UK	EEA/EFTA	CEFTA	Oth. Eur.	NAFTA	Sth. Am.	DAE	ASEAN-4	CN & HK	Oth. Asian	Oceania	ROW	Total
EUR15	552	15	9	132	1	19	6	46	2	46	1	22	133	46	10	25	824	2	162	5	31	14	12	11	1 694
B	15	2		3		1	1	1	5				3	1			31	1	1		1				51
DK	9		2	2							1	1	5	2		1	13		50	2	14	2	3	3	25
D	132	3	2	47		3	25	12	1	15		2	22	18	5	9	191	1	50	2	14	2	3	3	429
EL	1						1									1	1								3
E	19	1		3		2	4	4	1	1			4			6	1		1						27
F	113			25		4	34	12	9	1	5	22	3	2	2	5	120	1	31		2	2	2	1	281
IRL	6			1		1	2						3			1	15		1		1	1	1	1	25
I	46	1		12	1	4	12	5	3		1	7	2	1	1	4	46		11		1	1	1	1	113
L	2			1									1						14		2	3			2
NL	46	5		15		1	9	3	6			7	4	1		1	67		14		2	3	3	3	140
P	1					1							1												2
FIN	7		1								2	2	2	1		20		2							30
S	22			2		5		1		2	2	6	5	2		45		5			2				76
UK	133	3	5	22		4	22	7	7	1	2	5	52	13	1	3	269		46	3	8	5	6	3	490
EEA/EFTA	46	1	2	18		3	3	2	4	1	2	13	11	2	2	2	93		9		8	1			172
CEFTA	10			5		2	1	1		1		1	2	1		7		1							21
Other European ^a	25		1	9	1	5	1	4	1			3	2	2	16	44	10	4	10		4	1	1	2	105
NAFTA	824	31	13	191	1	6	120	15	67		20	45	269	93	7	443	959	11	788	3	83	30	43	30	5 915
South American	2	1				1				1						11	2		1	1		1			18
DAE	162	1		50		1	31	1	14		2	5	46	9	1	10	788	1	410	7	39	6	16	10	1 459
ASEAN-4 ^b	5			2									3			3	1		7	4	1	1	2	3	27
CN & HK	31	1		14		2	1	1	2		2	8	8	8		4	83		39	1	66		7	5	244
Other Asian	14	1		2		2	1	1	3		5	1	5	1	1	1	30		6	1	9	1	3	3	66
Oceania	12			3		2	2	1			6		6		1	1	43	1	16	2	7	1	36	4	123
ROW	11			3		1	1	3			3		3		2	30		10	3	5	3	4	16	84	
Total	1 694	51	25	429	3	27	281	113	2	140	2	30	76	490	21	1 055	915	18	1 459	27	244	66	123	84	9 928

Notes

- ^a Not including Turkey
- ^b Not including Malaysia

Source: IFR database

Table A.10.12: Inter-Enterprise Alliances: Technology AlliancesNumber of Alliances Between Sector Groups
1984 to 1991

Sector	Aerospace	Computers and Office Machinery	Electronics	Instruments	Pharmaceuticals	Electrical Machinery	Chemicals	Motor Vehicles	Other Sectors	TOTAL
Aerospace	22	3	9	10	1	9	6	10	37	107
Computers and Off. Machinery	3	72	50	30	6	34	3	6	406	610
Electronics	9	50	50	19	1	21	2	13	180	345
Instruments	10	30	19	32	37	15	17	3	140	303
Pharmaceuticals	1	6	1	37	190	2	63	0	234	534
Electrical Machinery	9	34	21	15	2	20	7	8	101	217
Chemicals	6	3	2	17	63	7	36	4	93	231
Motor Vehicles	10	6	13	3	0	8	4	25	42	111
Other Sectors	37	406	180	140	234	101	93	42	805	2 038
TOTAL	107	610	345	303	534	217	231	111	2 038	4 496

1992 to 1995

Sector	Aerospace	Computers and Office Machinery	Electronics	Instruments	Pharmaceuticals	Electrical Machinery	Chemicals	Motor Vehicles	Other Sectors	TOTAL
Aerospace	58	17	20	19	0	14	8	17	104	257
Computers and Off. Machinery	17	203	215	72	4	70	15	9	946	1 551
Electronics	20	215	145	49	1	59	11	8	574	1 082
Instruments	19	72	49	132	91	42	36	9	395	845
Pharmaceuticals	0	4	1	91	480	7	86	0	644	1 313
Electrical Machinery	14	70	59	42	7	49	17	27	266	551
Chemicals	8	15	11	36	86	17	88	8	233	502
Motor Vehicles	17	9	8	9	0	27	8	65	107	250
Other Sectors	104	946	574	395	644	266	233	107	2 713	5 982
TOTAL	257	1 551	1 082	845	1 313	551	502	250	5 982	12 333

Notes

The above matrix records partnerships between each of the eight sectors allocated within the IFR database.

Only about 50% of partners within the IFR database are allocated one of the eight sectors, other partnerships "are recorded under "other sectors". The count is for the NUMBER OF ALLIANCES represented for each combination of partnership. "

Each two partner alliance between different sectors will be represented twice, more than two partners will be represented more than twice.

Source: IFR database

Table A.10.13: Inter-Enterprise Alliances: Development Alliances by Country
1992 - 1995

Country	Pure CC Number of sentia-Alliances	Alliances																																				
		B	DK	D	EL	E	F	I	NL	A	FIN	S	UK	IS	NO	CH	PL	RO	RU	UA	SU	CA	MX	US	BR	CL	JP	KR	CN	HK	PK	IN	AL	MA	SY			
B	1											1										2		21			9	2	3					1				
DK	1													2	5	2	3																			1		
D	60	79		8	1	14	4	2	1																												1	
EL	2	2		1																				1														
E	2	5		1	1	1						1											1															
F	61	83		14	1	8	7	3				3	9	1					4				1													1		
I	20	32		4		7	3	2				2	1										10															
NL	19	24		2		3	2	2															1															
A	8	8		1					1			1	1										2															
FIN	4	4										1							1				4															
S	15	16		2		3			1			2		1								3																
UK	64	81	1	5	1	9	2		1	1	2	8	2	1	1							32																
IS	3	3		2		1	1					2										3																
NO	5	9		2							1	1										3																
CH	11	11		3							1	1		2								1																
PL	1	1																				1																
RO	1	1																	1			3																
RU	11	12																				1																
UA	1	1																																				
SU	1	1																																				
CA	9	15		2		1	1		1			3										1																
MX	2	3																																				
US	236	276		21	1	23	6	10	1	2	4	32	3	3	1							1																
BR	1	2																																				
CL	1	1																																				
JP	117	143		9		8	4	5	1	1	3	6	1																									
KR	15	16		2																																		
CN	18	21		3																																		
HK	2	3																																				
PK	1	2																																				
IN	8	8		1																																		
AL	1	1																																				
MA	1	2																																				
SY	2	2																																				
Total	705	870	1	79	2	5	83	32	24	8	4	16	81	3	9	11	1	12	1	1	15	3	276	2	1	143	16	21	3	2	8	1	2	2	2	2		

Source: Insead database

Table B.1.1: Gross Domestic Product (GDP)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU)										
	4 049 050	4 367 097	5 111 636	5 275 418	5 323 695	5 300 679	5 451 777	5 586 198	5 685 650	(i)
B	126 623	130 583	152 529	154 918	157 549	155 417	159 081	162 142	164 580	(i)
DK	64 318	73 291	78 652	79 729	79 863	81 086	84 627	87 021	84 598	(i)
D ^a	867 896	934 821	1 078 222	1 220 661	1 247 202	1 233 392	1 268 902	1 293 453	1 312 063	(i)
DE	867 896	934 821	1 078 222	1 132 542	1 152 279	1 130 630	1 155 283	..	..	(i)
EL	65 432	68 429	86 764	89 363	89 806	90 067	92 033	93 904	96 142	(i)
E	316 633	341 797	426 042	435 735	438 573	433 592	442 587	454 991	465 474	(i)
F	735 865	787 748	914 254	921 314	930 949	919 494	943 521	964 153	982 987	(i)
IRL	27 266	29 616	37 101	38 058	39 812	41 275	44 312	49 064	52 674	(i)
I	687 582	741 965	858 323	868 046	873 071	862 579	880 971	907 478	917 398	(i)
L ^b	5 700	6 695	8 095	8 466	8 779	9 133	9 491	9 796	9 648	(i)
NL	178 616	190 245	221 695	226 741	231 392	233 010	240 921	246 194	253 153	(i)
A	94 199	100 813	117 826	121 810	123 414	124 114	126 983	128 743	130 304	(i)
P ^c	64 785	67 605	86 211	88 181	89 803	90 080	91 106	93 364	95 733	(i)
FIN	55 002	63 331	74 808	69 506	67 053	66 238	69 168	72 137	71 974	(i)
S	114 530	120 578	134 909	133 442	131 460	128 560	132 892	137 599	141 846	(i)
UK	644 602	709 579	836 204	819 446	814 970	832 641	865 184	886 161	907 077	(i)
European Free Trade Association (EFTA)										
	177 516	196 614	221 339	223 664	225 656	226 720	232 395	235 407	241 004	
IS	3 160	3 614	4 406	4 464	4 316	4 352	4 508	4 587	4 834	(i,ii)
NO	58 450	68 859	74 211	76 557	79 025	81 208	85 294	88 107	92 837	(i)
CH	115 906	124 141	142 723	142 643	142 314	141 160	142 594	142 713	143 334	(i)
Central European Free Trade Association (CEFTA)										
	326 890	333 455	347 641	311 148	306 593	311 746	323 390	341 559	358 364	
CZ	81 157	86 705	93 800	80 466	75 379	74 615	76 600	80 331	84 991	(iii,ii)
SK	24 962	31 730	33 786	28 899	27 008	27 416	27 279	29 146	31 165	(iii,v,iv)
HU	51 829	58 352	59 385	52 325	50 824	50 504	52 020	52 801	53 089	(iii,v,ii)
PL	168 941	156 669	160 670	149 459	153 382	159 211	167 490	179 282	189 119	(iii,ii)
Other European Countries										
	1 143 207	1 362 966	1 513 287	1 428 476	1 284 220	1 219 438	1 088 898	1 079 322	..	
BG	29 192	36 065	38 930	34 372	31 860	31 385	31 953	32 784	..	(iii,v)
RO	95 532	111 016	92 343	80 422	73 350	74 450	77 353	82 708	..	(iii,v)
RU	686 665	806 620	886 320	842 555	719 926	656 959	574 275	541 930	..	(iii,v)
UA	172 345	208 087	232 073	204 997	177 149	151 986	117 060	103 247	..	(iii,v)
TR	159 472	201 179	263 622	266 130	281 935	304 657	288 024	309 060	322 974	(ii)
North American Free Trade Association (NAFTA)										
	4 694 492	5 316 764	6 057 852	6 035 040	6 163 809	6 342 029	6 602 551	6 693 679	6 860 612	
CA	383 655	442 274	509 853	500 683	504 756	516 223	539 593	551 267	556 323	(i)
MX	349 615	385 216	412 702	427 670	439 666	442 306	457 180	426 415	452 797	(ii)
US	3 961 222	4 489 273	5 135 296	5 106 687	5 219 387	5 383 500	5 605 779	5 715 997	5 851 492	(i)
South American Countries										
	542 269	535 229	591 799	624 780	652 277	680 768	710 044	727 100	739 400	
AR	181 720	161 385	163 681	178 184	193 467	205 079	220 282	222 482	..	(iii,iv,vi)
BR	202 045	218 463	240 503	241 562	238 755	251 407	265 874	..	..	(iii,iv)
CL	45 371	47 372	64 867	69 556	77 202	82 004	85 513	92 851	99 558	(iii,iv)
VE	113 132	108 008	122 747	135 478	142 854	142 278	138 376	141 362	139 092	(iii,iv)
Developed Asian Economies										
	1 628 168	1 983 936	2 605 920	2 734 091	2 793 083	2 836 164	2 901 676	2 978 782	3 104 700	
JP	1 377 531	1 625 880	2 038 103	2 118 037	2 141 768	2 143 923	2 154 158	2 171 770	2 252 203	(i)
KR	143 489	210 475	341 279	372 699	391 428	415 725	451 313	491 617	..	(iii,iv)
SG	18 983	25 573	37 627	40 173	42 966	45 892	50 504	54 926	..	(iii,iv)
TW	88 165	122 008	188 910	203 182	216 921	230 625	245 700	260 468	..	(vii)
Association of South-East Asian Nations (ASEAN-4)										
	485 095	587 470	826 832	879 967	934 036	996 196	1 073 075	1 158 796	1 250 000	
ID	222 448	284 053	383 411	410 060	436 548	464 907	499 961	540 012	582 225	(iii,iv)
MY	55 386	71 046	98 873	107 193	115 551	125 196	136 765	149 695	..	(iii,iv,vii)
PH	102 822	96 342	121 033	120 408	120 810	123 371	128 798	134 943	142 337	(iii,iv)
TH	104 440	136 029	223 515	242 305	261 126	282 722	307 551	334 146	..	(iii,iv)

Table B.1.1: Gross Domestic Product (GDP)

Million 1990 PPS (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
China and Hong Kong										
	648 977	1 025 778	1 490 631	1 612 418	1 834 989	2 084 147	2 324 439	2 560 748	2 674 800	
CN	601 030	962 830	1 398 551	1 516 572	1 734 017	1 977 640	2 211 840	2 445 189	..	(iii, iv)
HK	47 947	62 948	92 080	95 847	100 971	106 507	112 598	115 559	..	(iii,vii)
Other Asian Countries										
	770 639	1 008 768	1 361 985	1 380 309	1 449 300	1 488 398	1 576 550	1 686 149	1 773 800	
PK <i>d</i>	93 843	130 224	172 587	182 002	196 247	200 003	207 552	216 840	..	(iii,iv)
IN <i>e</i>	676 796	878 545	1 189 398	1 198 307	1 253 054	1 288 395	1 368 998	1 469 309	..	(iii,iv)
Oceania										
	224 913	259 877	294 214	294 331	303 867	319 125	333 266	343 333	353 597	
AU <i>f</i>	190 077	219 436	252 252	252 912	261 204	274 195	285 587	294 612	303 590	(ii)
NZ <i>e</i>	34 836	40 441	41 962	41 419	42 663	44 929	47 679	48 721	50 007	(ii)
Other Countries										
	157 468	170 383	190 626	192 857	192 987	196 904	204 452	213 460	220 955	
IL	33 748	38 864	47 884	51 556	55 301	57 325	61 031	65 347	68 225	(iii,iv)
ZA	123 720	131 519	142 742	141 302	137 686	139 579	143 421	148 113	152 730	(iii,iv)
Mediterranean Countries <i>g</i>										
	416 141	523 073	630 580	646 650	673 937	702 749	..	..	..
AL	..	..	..	..	..	..	..	..	..
CY	3 553	4 658	6 531	6 579	7 196	7 246	7 663	8 090	8 241	(iii,iv,vii)
DZ	51 840	67 103	68 483	67 733	68 707	67 852	..	..	..	(iii,iv)
EG <i>d</i>	64 444	90 376	104 508	106 741	107 108	107 662	111 941	117 081	..	(iii,iv)
IL	33 748	38 864	47 884	51 556	55 301	57 325	61 031	65 347	68 225	(iii,iv)
LB	..	..	..	..	..	..	..	..	..
MA	40 767	47 836	59 000	62 456	59 973	59 321	66 210	61 207	..	(iii,iv)
MT <i>h</i>	1 883	2 049	2 762	2 935	3 062	3 173	3 279	3 519	3 668	(iii,vii)
SY	42 817	49 406	52 887	56 668	62 666	66 845	71 945	74 530	..	(iii,iv)
TN	17 618	21 603	24 925	25 874	27 936	28 543	29 484	30 496	32 605	(iii,iv)
TR	159 472	201 179	263 622	266 130	281 935	304 657	288 024	309 060	322 974	(ii)

Notes*a* Data for Germany from 1991 onwards are for the whole territory, including the 5 new Länder*b* There has been a major revision in the Luxembourg National Accounts, but only the revised figures from 1985 onwards are available*c* From 1986 onwards Azores and Madeira are included, but this made too small a difference for a break in time series*d* Data are for the fiscal year, which ends 30 June*e* Data are for the fiscal year, which starts 1 April*f* Data are for the fiscal year, which starts 1 July*g* Not including Albania and the Lebanon*h* 1990 PPS is estimated

Source: (i) Eurostat (v) ECP (European Comparison Programme): those data are exclusively for 1990-1995
(ii) OECD (vi) CYTED RICYT/OEA MERCOCYT
(iii) World Bank (vii) national source
(iv) IMF

Table B.1.2: Gross Fixed Capital Formation (GFCF)

Million 1990 PPS

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU)										
	906 107	844 925	1 083 487	1 101 897	1 067 684	985 055	1 002 535	1 039 192	1 047 330	
B	26 517	20 235	31 193	29 344	29 671	27 599	27 601	28 517	29 510	(i)
DK	12 099	13 726	13 716	13 164	12 485	12 180	12 557	13 888	13 910	(i)
D <i>a</i>	195 744	182 397	225 680	280 616	287 656	269 174	278 724	280 831	273 872	(i)
DE	195 744	182 397	225 680	241 369	238 669	213 973	211 635	..	..	(i)
EL	19 307	16 266	19 983	20 097	19 411	18 623	18 327	18 950	20 070	(i)
E	70 312	65 554	104 175	103 656	95 641	86 043	87 335	93 910	94 468	(i)
F	169 208	151 727	195 415	195 368	186 921	170 383	170 084	173 447	173 438	(i)
IRL	7 716	5 586	6 645	6 191	6 203	5 900	6 467	7 387	8 090	(i)
I	168 279	153 474	174 227	171 866	167 469	146 202	146 138	154 260	155 236	(i)
L <i>b</i>	1 545	1 074	1 949	2 195	1 999	2 163	1 939	2 069	2 108	(i)
NL	38 187	37 415	46 326	46 161	46 319	44 730	45 033	47 807	49 524	(i)
A	24 192	22 012	27 813	29 604	29 415	28 702	30 355	31 306	31 547	(i)
P <i>c</i>	20 192	16 094	23 408	22 633	21 991	20 385	20 680	22 023	22 527	(i)
FIN	13 997	15 167	20 195	15 584	12 369	9 776	10 063	10 919	11 224	(i)
S	22 953	23 233	29 020	25 850	22 303	18 287	18 159	19 988	22 431	(i)
UK	115 859	120 965	163 740	139 566	127 829	124 909	129 073	133 893	139 374	(i)
European Free Trade Association (EFTA)										
	43 094	45 752	55 333	53 197	50 273	48 981	51 592	51 970	52 932	
IS	804	763	849	857	755	680	683	699	845	(i,ii)
NO	14 142	14 834	16 054	15 800	15 753	16 590	18 001	18 810	19 085	(i,ii)
CH	28 148	30 155	38 430	36 540	33 765	31 711	32 907	32 461	33 001	(i)
Central European Free Trade Association (CEFTA)										
	84 070	75 019	81 013	67 309	64 340	61 374	66 939	73 991	85 511	
CZ	20 050	22 184	24 686	18 561	21 494	19 823	22 984	25 835	29 340	(iii,ii)
SK	7 903	9 318	11 151	8 625	6 998	6 715	6 358	6 741	9 022	(iii,iv)
HU	14 931	13 102	11 438	10 974	10 098	9 542	10 470	10 574	11 055	(iii,ii)
PL	41 186	30 416	33 738	29 149	25 749	25 294	27 127	30 841	36 093	(iii,ii)
Other European Countries										
	..	..	351 700	286 529	225 107	230 948	213 700	203 300	..	
BG	8 250	9 530	8 276	6 276	6 237	6 296	..	..	..	(iii)
RO	32 954	33 447	18 277	11 568	14 075	13 306	15 261	..	..	(iii,iv)
RU	..	..	254 473	196 877	134 394	127 554	119 274	103 731	..	(iii,iv)
UA	..	..	..	9 187	4 482	4 049	3 196	2 701	..	(iii,iv)
SU <i>de</i>	..	658 855	..	..	..	..	..	..	..	(v)
TR	25 334	43 853	60 290	62 621	65 919	79 742	69 420	74 305	89 613	(ii)
North American Free Trade Association (NAFTA)										
	874 567	928 295	928 186	848 004	867 423	919 802	1 011 416	1 154 040	1 204 699	
CA <i>f</i>	90 123	87 830	108 751	98 774	95 223	94 241	101 106	98 258	96 279	(i,ii)
MX	86 562	73 547	76 796	83 287	91 428	90 040	94 447	70 597	74 989	(ii)
US <i>f</i>	697 882	766 918	742 639	665 944	680 772	735 521	815 863	985 185	1 033 431	(i)
South American Countries										
	129 573	91 929	107 039	110 408	125 487	135 070	142 013	135 800	141 100	
AR <i>d</i>	45 891	28 203	22 911	26 081	32 314	38 050	45 964	38 189	..	(iii,iv)
BR	46 273	37 026	51 673	45 644	45 549	48 321	53 124	..	..	(iii,iv)
CL	9 205	7 980	15 108	14 534	17 517	20 952	20 762	21 580	24 364	(iii,iv)
VE	28 204	18 721	17 347	24 149	30 107	27 747	22 163	21 580	21 686	(iii,iv)
Developed Asian Economies										
	515 291	540 631	828 962	868 015	861 858	856 190	855 144	877 350	948 800	
JP	434 029	446 733	646 761	664 512	651 546	633 262	617 831	616 519	672 456	(i,ii)
KR	46 554	60 106	126 538	143 297	143 138	149 733	161 337	180 051	..	(iii,iv)
SG	7 720	10 791	13 312	15 157	16 780	18 590	19 692	21 022	..	(iii,iv)
TW	26 989	23 000	42 351	45 048	50 393	54 605	56 285	59 758	..	(vi)
Association of South-East Asian Nations (ASEAN-4)										
	122 216	140 476	258 969	277 809	286 650	297 384	327 977	352 900	375 000	
ID	47 978	65 501	109 053	115 191	118 962	110 304	119 314	128 879	135 994	(iii)
MY	17 244	21 207	32 002	38 209	39 640	44 045	52 205	..	..	(iii,iv)
PH	27 989	16 816	27 971	24 134	25 277	29 326	30 433	29 945	34 025	(iii,iv)
TH	29 005	36 952	89 943	100 275	102 771	113 709	126 025	142 948	..	(iii,iv)

Table B.1.2: Gross Fixed Capital Formation (GFCF)

Million 1990 PPS

(continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
China and Hong Kong										
	160 521	301 023	360 465	412 072	538 850	750 174	<i>840 200</i>	<i>926 000</i>	<i>967 000</i>	
CN	144 408	287 244	335 248	385 636	510 981	721 786	..	..	..	(iii)
HK	16 113	13 779	25 216	26 436	27 869	28 388	<i>32 918</i>	<i>33 522</i>	..	(iii,vi)
Other Asian Countries										
	147 292	203 223	299 848	291 356	300 064	319 177	349 972	405 502	<i>389 200</i>	
PK <i>g</i>	16 544	21 483	29 860	28 087	33 243	37 477	<i>36 345</i>	<i>36 539</i>	..	(iii,iv)
IN <i>h</i>	130 748	181 740	269 988	263 269	266 821	281 699	313 628	368 963	..	(iii,iv)
Oceania										
	54 750	64 696	62 120	57 162	59 909	63 969	70 235	69 747	<i>70 200</i>	
AU <i>fi</i>	47 571	54 115	54 187	50 620	52 944	55 749	60 726	59 648	61 058	(ii)
NZ <i>h</i>	7 179	10 582	7 934	6 543	6 965	8 220	9 509	10 100	..	(ii)
Other Countries										
	39 482	37 475	36 670	36 885	34 916	33 656	36 109	39 401	40 903	
IL	7 124	6 803	8 690	11 691	12 114	12 087	13 116	14 409	14 857	(iii,iv)
ZA	32 358	30 672	27 980	25 194	22 802	21 569	22 993	24 993	26 046	(iii,iv)
Mediterranean Countries <i>j</i>										
	93 307	125 138	139 578	144 792	149 200	162 600	..	..	..
AL	..	..	..	..	..	..	..	..	..	(iii)
CY	1 215	1 267	1 607	1 600	1 873	1 695	1 632	1 685	..	(iii,iv)
DZ	17 507	21 347	17 331	17 517	18 656	18 393	..	..	..	(iii,iv)
EG <i>g</i>	15 868	22 744	22 407	21 360	18 848	17 813	<i>19 118</i>	<i>18 508</i>	..	(iii,iv)
IL	7 124	6 803	8 690	11 691	12 114	12 087	13 116	14 409	14 857	(iii,iv)
LB	..	..	..	..	..	..	..	..	..	(iii)
MA	9 067	11 054	14 146	13 942	13 646	13 266	<i>13 393</i>	<i>13 204</i>	..	(iii,iv)
MT <i>k</i>	<i>418</i>	<i>542</i>	<i>874</i>	<i>870</i>	<i>846</i>	<i>922</i>	..	..	..	(iii)
SY	11 789	11 745	8 150	8 954	..	..	..	..	..	(iii)
TN	4 986	5 784	6 082	6 237	7 403	8 237	7 845	7 697	8 475	(iii,iv)
TR	25 334	43 853	60 290	62 621	65 919	79 742	69 420	74 305	89 613	(ii)

Notes

a Data for Germany from 1991 onwards are for the whole territory, including the 5 new Länder

b There has been a major revision in the Luxembourg National Accounts, but only the revised figures from 1985 onwards are available

c From 1986 onwards Azores and Madeira are included, but this made too small a difference for a break in time series

d Data are for gross capital formation (incl. change in stocks)

e Data are in million 1989 PPS

f Not including livestock

g Data are for the fiscal year, which ends 30 June

h Data are for the fiscal year, which starts 1 April

i Data are for the fiscal year, which starts 1 July

j Not including Albania and the Lebanon

k 1990 PPS is estimated from previous years

Source: (i) Eurostat (iv) IMF
(ii) OECD (v) UN
(iii) World Bank (vi) national source

Table B.2.1: Implicit GDP Price Index

1990=100

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU)										
	59.10	82.10	100	105.20	108.60	109.50	111.80	113.30	117.10	
B	64.70	86.30	100	103.10	106.80	110.90	113.70	115.30	117.10	(i)
DK	57.20	82.60	100	102.20	105.50	106.20	108.00	109.80	117.30	(i)
D <i>a</i>	75.40	86.70	100	103.90	109.60	113.80	116.30	118.80	120.60	(i)
DE	75.40	86.70	100	103.90	108.50	111.80	114.10	..	..	(i)
DD <i>b</i>	104.36	107.30	..	103.90	122.80	134.90	138.60	..	..	(vi,i)
EL	21.10	53.30	100	119.90	137.30	154.70	170.40	186.20	201.30	(i)
E	40.70	70.10	100	107.10	114.50	119.40	124.20	130.30	135.10	(i)
F	53.60	83.80	100	103.30	105.60	108.10	110.00	111.80	112.70	(i)
IRL	46.70	81.60	100	101.80	103.90	108.30	109.50	110.10	113.20	(i)
I	36.70	71.50	100	107.70	112.70	117.70	121.80	127.80	133.60	(i)
L <i>c</i>	54.60	79.20	100	103.00	108.20	113.90	120.30	122.20	130.00	(i)
NL	82.10	96.00	100	102.70	105.00	107.10	109.20	110.70	112.10	(i)
A	69.70	88.30	100	103.80	108.30	111.10	114.30	116.50	118.50	(i)
P <i>d</i>	20.00	53.70	100	112.10	124.00	131.40	150.70	149.00	154.40	(i)
FIN	50.50	76.00	100	102.50	103.20	105.70	107.00	109.80	114.40	(i)
S	46.00	71.30	100	107.60	108.80	111.60	114.30	118.60	119.10	(i)
UK	54.60	76.40	100	106.60	111.50	114.90	117.00	119.80	122.80	(i)
European Free Trade Association (EFTA)										
	60.86	80.77	100	104.48	106.09	108.25	109.76	112.66	113.73	
IS	6.20	40.50	100	107.60	111.60	114.30	116.70	120.20	123.10	(i,ii)
NO	54.80	81.20	100	102.40	102.00	104.20	104.80	108.00	111.60	(i)
CH	65.40	81.70	100	105.50	108.20	110.40	112.50	115.30	114.80	(i)
Central European Free Trade Association (CEFTA)										
	34.77	41.68	100	147.91	192.55	241.32	296.99	365.73	429.18	
CZ	84.61	90.33	100	147.25	173.62	201.77	224.02	249.60	277.10	(iii,ii)
SK	95.29	88.87	100	134.43	170.65	197.25	224.37	245.17	258.70	(v,iv)
CS	80.56	88.22	100	..	..	..	..	..	..	(vi)
HU	39.54	50.35	100	135.44	164.57	199.59	238.49	296.24	359.97	(iii,ii)
PL	0.43	1.97	100	155.24	214.97	280.68	360.37	457.82	545.05	(ii)
Other European Countries										
	65.36	71.59	100	218.21	2 703	36 564	223 219	899 500	..	
BG	75.76	77.50	100	338.53	540.43	816.64	1 401	2 279	..	(v)
RO	69.51	79.26	100	294.96	884.76	2 899	6 929	9 403	..	(v)
RU	74.02	81.57	100	228.52	3 633	35 930	146 368	413 971	..	(v)
UA	85.23	85.68	100	202.69	3 948	135 595	1 350 720	133 560	..	(v)
SU <i>b</i>	86.97	94.51	..	..	..	..	..	..	..	(vi)
TR	2.20	11.70	100	158.80	260.10	436.30	900.80	1 636	2 781	(i,ii)
North American Free Trade Association (NAFTA)										
	58.51	77.73	100	104.98	108.90	111.86	114.56	123.40	129.75	
CA	61.70	82.50	100	102.80	104.10	105.20	105.90	107.70	109.40	(i,ii)
MX	0.77	7.40	100	121.63	139.37	153.28	164.77	222.80	280.70	(ii)
US	63.30	83.30	100	103.80	106.80	109.10	111.30	117.50	120.00	(i)
South American Countries										
	4.35	8.15	100	302.43	2 213	48 587	1 176 342	..	..
AR	0.00	0.01	100	241.10	278.20	295.67	301.00	313.60	..	(iii,iv)
BR	0.00	0.00	100	501.87	5 683	131 157	3 141 067	..	..	(iii,iv)
CL	16.58	39.17	100	120.89	140.49	157.47	179.36	201.24	208.37	(iii,iv)
VE	14.18	23.17	100	120.69	155.75	206.25	336.40	504.93	1 067	(iii,iv)
Developed Asian Economies										
	79.21	90.99	100	103.79	106.41	108.22	109.93	111.29	..	
JP	82.50	93.40	100	102.70	104.40	105.10	105.40	105.00	105.00	(i)
KR	51.23	74.11	100	110.03	116.74	122.15	128.87	135.83	..	(iii,iv)
SG	75.15	86.54	100	103.38	104.66	110.28	115.05	117.92	..	(iii,iv)
TW	74.18	88.93	100	103.85	107.93	111.72	113.83	116.06	..	(vii)

Table B.2.1: Implicit GDP Price Index

1990=100 (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										
	48.72	72.90	100	108.38	115.18	127.89	136.49	147.34	..	
ID	43.10	66.94	100	108.73	116.69	139.05	149.86	164.21	178.07	(iii,iv)
MY	82.16	93.08	100	103.17	109.17	111.16	115.68	121.43	..	(ii,iv,vii)
PH	26.63	66.69	100	116.45	125.70	134.28	147.71	158.79	172.93	(iii,iv)
TH	64.71	79.23	100	106.08	110.45	114.16	119.32	127.07	..	(iii,iv)
China and Hong Kong										
	55.36	66.82	100	107.79	116.13	130.09	161.19	181.75	..	
CN	56.03	66.72	100	107.62	115.81	130.03	162.28	183.44	..	(iii,iv)
HK	47.00	68.33	100	110.52	121.64	131.16	139.74	146.08	..	(iii,vii)
Other Asian Countries										
	45.50	67.42	100	114.38	125.42	136.11	151.54	163.88	..	
PK <i>e</i>	50.39	73.11	100	113.06	124.45	135.25	152.64	173.46	..	(iii,iv)
IN <i>f</i>	44.82	66.57	100	114.58	125.58	136.25	151.37	162.47	..	(iii,iv)
Oceania										
	47.55	71.77	100	101.74	102.86	103.95	105.99	108.60	111,52	
AU <i>g</i>	49.28	73.00	100	101.80	103.10	104.20	106.30	109.00	112.00	(ii)
NZ <i>f</i>	38.08	65.10	100	101.40	101.40	102.40	104.10	106.20	108.60	(ii)
Other Countries										
	20.17	45.10	100	115.35	130.20	144.13	159.43	174.14	190,45	
IL	0.15	33.89	100	120.52	134.17	148.91	168.27	185.30	206.13	(iii,iv)
ZA	25.63	48.41	100	113.46	128.60	142.17	155.67	169.22	183.45	(iii,iv)
Mediterranean Countries <i>h</i>										
	21.24	36.64	100	137.49	189.99	274.98	..	..	..
AL	104.44	102.44	100	135.53	441.77	..	..	..	..	(iii)
CY	54.69	81.31	100	103.89	108.61	111.76	116.00	119.37	..	(iii,iv)
DZ	40.01	55.46	100	159.12	194.15	218.51	..	..	..	(ii)
EG <i>e</i>	33.91	48.56	100	122.44	146.13	161.34	172.64	193.35	..	(ii,iv)
IL	0.15	33.89	100	120.52	134.17	148.91	168.27	185.30	..	(iii,iv)
LB	..	..	..	..	..	..	..	..	..
MA	50.38	75.04	100	107.14	111.49	115.73	116.21	124.62	..	(iii,iv)
MT	78.23	87.31	100	103.32	107.02	110.56	..	..	..	(iii)
SY	23.60	33.20	100	108.37	116.89	122.00	137.62	145.91	..	(iii,iv)
TN	46.39	73.84	100	107.03	113.65	118.79	124.85	130.97	137.17	(iii,iv)
TR	2.20	11.70	100	158.80	260.10	436.30	900.80	1 636	2 781	(i,ii)

Notes**italics** Figures are derived by applying IMF growth rates on World Bank figures*a* Data for Germany from 1991 onwards are for the whole territory, including the 5 new Länder*b* Data before 1990: 1989=100*c* There has been a major revision in the Luxembourg National Accounts, but only the revised figures from 1985 onwards are available*d* From 1986 onwards Azores and Madeira are included, but this made too small a difference for a break in time series*e* Data are for the fiscal year, which ends 30 June*f* Data are for the fiscal year, which starts 1 April*g* Data are for the fiscal year, which starts 1 July*h* Not including Albania and the Lebanon

Source: (i) Eurostat (v) World Bank until 1990 and European Comparison Program from 1991
(ii) OECD (vi) UN
(iii) World Bank (vii) national source
(iv) IMF

Table B.2.2: Consumer Price Index (CPI)

1990=100

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU)										
	..	81.09	100	105.13	109.54	113.25	116.78	120.41	123.42	
B	64.12	90.09	100	103.21	105.72	108.63	111.22	112.85	115.14	(i)
DK	56.35	82.48	100	102.40	104.55	105.86	107.96	110.21	112.54	(i)
D ^a	77.23	93.45	100	103.64	107.79	111.65	114.70	116.81	118.50	(i)
EL	17.56	44.92	100	119.45	138.40	158.35	175.65	191.95	208.27	(i)
E	41.45	73.08	100	105.95	112.20	117.36	122.88	128.63	133.23	(i)
F	54.34	85.87	100	103.20	105.65	107.82	109.72	111.57	113.86	(i)
IRL	47.65	85.01	100	103.15	106.38	107.86	110.37	113.19	115.11	(i)
I	39.86	75.89	100	106.28	111.77	116.74	121.41	127.69	132.66	(i)
L	64.48	91.74	100	103.12	106.37	110.18	112.61	114.76	116.33	(i)
NL	78.45	95.94	100	103.89	107.19	109.97	113.06	115.23	117.62	(i)
A	70.79	89.82	100	103.34	107.50	111.39	114.69	117.26	119.46	(i)
P	20.59	58.51	100	110.91	120.93	128.71	135.44	141.06	145.46	(i)
FIN	52.17	78.52	100	104.30	107.36	109.70	110.89	111.97	112.67	(i)
S	48.13	74.00	100	109.34	111.83	117.03	119.60	122.63	123.21	(i)
UK	52.99	75.00	100	105.86	109.81	111.53	114.29	118.19	121.06	(i)
European Free Trade Association (EFTA)										
IS	5.60	39.92	100	106.81	111.04	115.57	117.36	119.31	122.01	(i,ii)
NO	47.97	73.88	100	103.42	105.84	108.24	109.76	112.46	113.84	(i)
CH	71.67	88.36	100	105.84	110.12	113.75	114.73	116.79	117.70	(i)
Central European Free Trade Association (CEFTA)										
CZ	..	..	100	156.70	174.09	210.31	231.34	252.39	274.67	(iv,ii)
SK	..	88.70	100	161.20	177.32	218.46	247.73	272.26	288.16	(iii,iv,ii)
CS	80.65	89.03	100	157.80	174.80	..	..	..	..	(iii,iv)
HU	36.10	50.20	100	135.00	166.05	203.41	241.65	309.80	382.57	(iii,iv,ii)
PL	0.45	1.76	100	170.30	243.53	329.49	435.59	556.69	673.67	(iii,iv,ii)
Other European Countries										
BG	69.22	72.40	100	438.50	787.11	1 229	2 299	3 726	8 310	(iii,iv)
RO	70.90	89.70	100	270.20	838.70	2 987	7 069	9 353	12 982	(ii,iv)
RU	..	..	100	260.00	4 319	33 469	136 889	406 560	599 960	(iii,iv,ii)
UA	86.88	90.27	100	390.00	5 354	258 876	2 565 457	12 237 228	22 067 393	(iii,iv)
SU	85.03	88.95	100	..	..	..	..	..	..	(iii)
TR	2.33	11.77	100	165.97	282.27	468.84	967.04	1 819	3 281	(ii)
North American Free Trade Association (NAFTA)										
CA	56.18	80.39	100	105.62	107.21	109.18	109.38	111.75	113.50	(i)
MX	0.70	7.10	100	122.70	141.70	155.50	166.30	224.50	301.70	(ii)
US	63.05	82.30	100	104.23	107.39	110.56	113.44	116.63	120.08	(i)
South American Countries										
AR ^{bc}	0.00	6.69	100 000							(ii)
AR			100	272.00	339.00	375.00	391.00	404.20	405.20	(ii)
BR ^{cd}	0.39	38.00	1 000 000							(ii)
BR			1	5.00	60.00	1 348	37 331	68 830	81 376	(ii)
CL ^e	16.00	41.00	100	122.00	141.00	158.00	177.00	191.00	205.00	(ii)
VE ^f	12.40	20.80	100	134.20	176.40	243.60	391.80	626.50	1 252	(ii)
Developed Asian Economies										
JP	81.60	93.51	100	103.27	105.05	106.38	107.12	107.02	107.22	(i,ii)
KR	54.47	76.80	100	109.30	116.12	121.69	129.32	135.10	141.80	(ii)
SG	80.00	93.80	100	103.40	105.80	108.20	111.50	113.50	115.00	(ii)
TW	74.00	89.69	100	103.60	108.30	111.40	116.00	120.30	..	(v)
Association of South-East Asian Nations (ASEAN-4)										
ID	43.90	69.76	100	109.41	117.65	129.05	140.04	153.25	165.45	(ii)
MY	72.90	91.50	100	104.40	109.30	113.20	117.40	123.60	128.00	(ii)
PH	27.00	68.70	100	118.70	129.30	139.10	151.70	163.97	177.77	(ii)
TH	65.00	82.70	100	105.70	110.00	113.70	119.60	126.40	133.80	(ii)

Table B.2.2: Consumer Price Index (CPI)

1990=100 (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
China and Hong Kong										
CN	49.30	60.30	100	105.10	113.20	132.50	165.60	193.59	209.70	(ii,iii)
HK	45.90	71.20	100	111.00	121.70	132.30	143.70	156.90	164.80	(ii)
Other Asian Countries										
PK	51.06	72.10	100	111.79	122.42	134.63	151.28	169.96	187.56	(ii)
IN	42.80	66.80	100	113.90	127.30	135.40	149.20	164.50	179.20	(ii)
Oceania										
AU	45.80	68.30	100	103.20	104.20	106.10	108.10	113.20	116.10	(ii)
NZ	36.30	64.00	100	102.60	103.60	105.00	106.80	110.80	113.30	(ii)
Other Countries										
IL	0.20	34.40	100	119.00	133.20	147.80	166.00	182.70	203.30	(ii)
ZA	25.50	49.00	100	115.30	131.30	144.00	157.00	170.50	183.20	(ii)
Mediterranean Countries										
AL	..	..	100	136.28	442.48	818.58	1 003	1 081	1 219	(iii)
CY	62.17	85.70	100	105.04	111.87	117.30	122.82	126.03	129.83	(ii)
DZ <i>g</i>	39.70	61.40	100	125.90	165.80	199.80	257.80	340.80	..	(ii)
EG	21.00	40.50	100	119.70	136.10	152.50	165.00	190.90	204.70	(ii)
IL	0.20	34.40	100	119.00	133.20	147.80	166.00	182.70	203.30	(ii)
LB <i>h</i>	0.63	1.59	100	148.42	268.25	310.26	331.36	..	..	(ii)
MA	49.60	79.30	100	108.00	114.20	120.10	126.30	134.00	138.00	(ii)
MT	80.10	93.10	100	102.50	104.20	108.50	113.00	117.50	120.50	(ii)
SY	14.00	25.75	100	109.00	121.00	137.00	158.00	170.61	184.68	(ii)
TN	44.92	70.70	100	108.20	114.50	119.00	124.70	132.50	137.40	(ii,iii)
TR	2.33	11.77	100	165.97	282.27	468.84	967.04	1 819	3 281	(ii)

Notes

a Starting with the index for January 1993 the indices for Germany and for the EUR 15 average reflect the territory after the German reunification on 3rd October 1990.

b Buenos Aires

c Scaling of the base year has been used in order to keep the figures readable.

d Rio de Janeiro

e Santiago

f Caracas

g Alger

h Series estimated from the reported growth rates

Source: (i) Eurostat

(ii) IMF

(iii) ILO

(iv) European Comparison Program (1990-1995 only)

(v) national source

Table B.3.1: European Currency Unit (ECU)

Annual average, 1 ECU = ...

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU)										
B	40.60	44.91	42.43	42.22	41.59	40.47	39.66	38.55	39.22	(i)
DK	7.83	8.02	7.86	7.91	7.81	7.59	7.54	7.33	7.35	(i)
D ^a	2.52	2.23	2.05	2.05	2.02	1.94	1.93	1.87	1.91	(i)
DE	2.52	2.23	2.05	2.05	2.02	1.94	1.93	1.87	1.91	(i)
DD ^a	3.62	2.12	1.50	2.05	2.02	1.94	1.93	1.87	1.91	(v,vii,i)
EL	59.32	105.74	201.41	225.22	246.98	268.57	287.94	302.99	305.12	(i)
E	99.70	129.17	129.32	128.47	132.51	149.12	158.87	163.00	160.43	(i)
F	5.87	6.80	6.91	6.97	6.85	6.63	6.58	6.53	6.48	(i)
IRL	0.68	0.72	0.77	0.77	0.76	0.80	0.79	0.82	0.80	(i)
I	1 189	1 448	1 522	1 533	1 595	1 841	1 914	2 130	1 958	(i)
L	40.60	44.91	42.43	42.22	41.59	40.47	39.66	38.55	39.22	(i)
NL	2.76	2.51	2.31	2.31	2.27	2.18	2.16	2.10	2.14	(i)
A	17.97	15.64	14.44	14.43	14.22	13.62	13.54	13.18	13.42	(i)
P	69.55	130.25	181.11	178.61	174.70	188.37	196.87	196.11	195.84	(i)
FIN	5.17	4.69	4.85	5.00	5.81	6.70	6.19	5.71	5.82	(i)
S	5.88	6.52	7.52	7.48	7.53	9.12	9.16	9.33	8.49	(i)
UK	0.60	0.59	0.71	0.70	0.74	0.78	0.78	0.83	0.82	(i)
European Free Trade Association (EFTA)										
IS	6.60	31.70	74.22	73.22	74.79	79.01	83.01	84.71	84.58	(ii)
NO	6.87	6.51	7.95	8.02	8.04	8.31	8.37	8.29	8.21	(i)
CH	2.33	1.86	1.76	1.77	1.82	1.73	1.62	1.55	1.56	(i)
Central European Free Trade Association (CEFTA)										
CZ	19.85	13.11	22.86	36.52	36.68	34.14	34.14	34.71	34.42	(iii,ii)
SK	19.85	13.11	22.86	36.64	36.68	36.03	38.04	38.90	38.90	(iii,ii,iv)
CS	19.85	13.11	22.86	36.53	36.68	..	..	..	..	(v,vii)
HU	45.30	38.25	80.76	92.63	102.21	107.41	124.69	162.70	193.57	(iii,ii)
PL	0.01	0.01	1.21	1.31	1.76	2.11	2.70	3.17	3.42	(iv,ii)
Other European Countries										
BG	1.79	1.42	2.79	19.42	30.30	32.38	64.39	87.81	225.74	(iii,vi,iv)
RO	25.06	13.08	29.32	89.02	399.79	890.10	1 964	2 947	3 922	(iii,ii,i)
RU	..	0.99	0.74	2.07	249.88	1 092	2 616	5 957	6 499	(iii,viii,ii,iv)
UA	..	..	0.75	2.17	260.25	5 616	37 627	192 644	239 253	(iii,viii,iv)
SU	0.87	0.47	..	..	..	..	..	..	..	(v)
TR	105.87	398.32	3 321	5 170	8 921	12 756	34 574	59 912	101 203	(i,ii)
North American Free Trade Association (NAFTA)										
CA	1.57	1.04	1.49	1.42	1.57	1.51	1.62	1.79	1.74	(i)
MX	0.03	0.24	3.61	3.74	4.02	3.65	4.02	8.37	9.65	(ii)
US	1.39	0.76	1.27	1.24	1.30	1.17	1.19	1.31	1.27	(i)
South American Countries										
AR	0.00	0.00	0.62	1.18	1.29	1.17	1.19	1.31	1.27	(iii,iv)
BR	0.00	0.00	0.00	0.00	0.00	0.04	0.76	1.20	1.28	(iii,iv)
CL	54.30	122.92	388.47	432.93	470.68	473.49	499.69	518.99	523.17	(iv)
VE	5.98	5.72	59.72	70.40	88.76	106.36	176.75	231.31	529.60	(iv)
Developed Asian Economies										
JP	315.04	180.56	183.68	166.49	164.21	130.15	121.23	123.01	137.30	(i)
KR	845.74	663.90	901.28	908,74	1 013	939.93	955.72	1 009	1 021	(iv)
SG	2.98	1.68	2.31	2.14	2.11	1.89	1.82	1.85	1.79	(iv)
TW	50.14	30.41	34.24	33.23	32.67	30.90	31.40	34.64	..	(viii)
Association of South-East Asian Nations (ASEAN-4)										
ID	872.98	847.47	2 347	2 417	2 635	2 444	2 570	2 941	2 972	(iv)
MY	3.03	1.89	3.44	3.41	3.31	3.01	3.12	3.28	3.19	(iv)
PH	10.46	14.20	30.96	34.05	33.12	31.76	31.42	33.63	33.27	(iv)
TH	28.51	20.72	32.58	31.62	32.97	29.65	29.92	32.59	32.16	(iv)

Table B.3.1: European Currency Unit (ECU)

Annual average, 1 ECU = ... (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
China and Hong Kong										
CN	3.12	2.24	6.66	7.11	8.27	9.39	10.23	10.92	10.55	(iii,iv)
HK	6.93	5.94	9.92	9.63	10.05	9.06	9.19	10.12	9.81	(iv)
Other Asian Countries										
PK	13.78	11.57	27.24	27.72	32.17	30.32	36.36	41.39	45.78	(iii,iv)
IN	10.99	9.34	22.86	30.38	34.29	36.73	37.32	42.41	44.96	(iii,iv)
Oceania										
AU	1.22	1.09	1.63	1.59	1.77	1.72	1.62	1.77	1.62	(ii,i)
NZ	1.43	1.54	2.14	2.14	2.41	2.17	2.00	1.99	1.84	(ii,i)
Other Countries										
IL	0.01	0.90	2.57	2.82	3.19	3.31	3.58	3.94	4.05	(iv)
ZA	1.08	1.70	3.29	3.42	3.70	3.80	4.22	4.75	5.45	(iv,i)
Mediterranean Countries										
AL	13.23	6.55	10.19	18.09	91.00	117.80	112.55	121.25	132.61	(iii,iv)
CY	0.49	0.47	0.58	0.57	0.58	0.58	0.58	0.59	0.59	(iii,i)
DZ	5.34	3.84	11.41	22.89	28.35	27.34	41.70	62.34	69.48	(iv)
EG	1.00	0.73	2.84	3.73	4.31	3.90	4.03	4.44	4.29	(iii,iv)
IL	0.01	0.90	2.57	2.82	3.19	3.31	3.58	3.94	4.05	(iv)
LB	4.78	12.23	855.80	1 146	1 991	2 040	2 003	2 123	1 994	(iv)
MA	5.48	7.68	10.50	10.79	11.08	10.89	10.95	11.17	11.06	(iv)
MT	0.48	0.36	0.40	0.40	0.41	0.45	0.45	0.46	0.46	(iii,i)
SY	5.46	3.87	23.72	21.66	..	..	..	..	..	(iii)
TN	0.56	0.64	1.12	1.15	1.15	1.18	1.20	1.24	1.24	(iv)
TR	105.87	398.32	3 321	5 170	8 921	12 756	34 574	59 912	101 203	(i,ii)

Notes

a Break in series because of unification

Source: (i) Eurostat (v) Penn World Table 5.6
(ii) OECD (vi) European Comparison Program
(iii) World Bank (vii) UN
(iv) IMF (viii) national source

Second European Report on S&T Indicators, 1997

Table B.3.2: Purchasing Power Standard (PPS)

Annual average, 1 PPS = ...

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU)										
	1	1	1	1	1	1	1	1	1	
B	46.25	44.13	42.45	41.61	40.87	40.25	40.10	40.48	39.40	(i)
DK	9.75	10.17	10.16	9.75	9.89	9.49	9.37	9.27	9.23	(i)
D ^a	2.85	2.41	2.25	2.22	2.23	2.27	2.23	2.22	2.20	(i)
DE	2.85	2.41	2.25	2.22	2.23	2.27	2.23	2.22	2.20	(iii,i)
DD ^a	3.35	2.72	..	2.22	2.23	2.27	2.23	2.22	2.20	(i)
EL	47.68	86.97	151.48	171.25	183.95	198.91	211.00	223.77	239.19	(i)
ES	80.20	99.90	117.70	117.30	124.13	126.19	130.46	134.51	135.52	(i)
F	6.44	7.22	7.12	6.92	6.94	7.09	7.12	7.12	7.01	(i)
IRL	0.65	0.78	0.74	0.71	0.69	0.71	0.69	0.70	0.67	(i)
I	942	1328	1527	1 554	1 578	1 655	1 649	1 708	1 731	(i)
L	44.45	44.70	42.71	41.95	42.06	42.75	43.02	42.83	42.70	(i)
NL	3.17	2.70	2.33	2.32	2.31	2.30	2.28	2.22	2.24	(i)
A	17.32	15.88	15.15	15.06	15.13	14.96	14.97	15.13	14.81	(i)
P	36.00	69.80	111.60	116.80	125.00	126.17	127.01	131.20	131.74	(i)
FIN	5.82	6.33	6.89	6.88	6.88	6.57	6.61	6.46	6.58	(i)
S	8.04	8.69	10.08	10.57	10.60	10.61	10.65	10.72	10.76	(i)
UK	0.60	0.61	0.66	0.68	0.67	0.69	0.69	0.72	0.70	(i)
European Free Trade Association (EFTA)										
IS	7.43	38.8	82.6	85.3	85.70	88.77	90.39	95.28	94.42	(i,ii)
NO	8.31	9.5	9.73	9.59	9.22	9.43	9.81	10.08	9.90	(i)
CH	2.28	2.18	2.2	2.23	2.34	2.30	2.26	2.22	2.18	(i)
Central European Free Trade Association (CEFTA)										
CZ	..	..	6.05	8.56	9.67	11.30	12.08	13.22	..	(ii)
SK	..	..	7.21	9.45	10.77	11.93	12.89	14.19	..	(iv)
CS	16.85	12.70	10.87	..	..	..	..	..	..	(iii)
HU	22.56	20.95	35.18	43.66	50.93	62.18	72.83	74.15	..	(iii,iv,ii)
PL	0.00	0.01	0.35	0.53	0.75	0.94	1.16	1.44	..	(iii,iv,ii)
Other European Countries										
BG	1.21	0.87	1.17	3.85	6.27	9.10	15.10	24.37	..	(iii,iv)
RO	26.23	20.57	9.29	26.72	81.80	257.55	595.20	801.34	..	(iii,iv)
RU	..	..	0.73	1.62	26.29	249.75	983.70	2 760	..	(iv)
UA	..	..	0.72	1.42	28.28	933.45	8 990	47 104	..	(iv)
SU	0.65	0.45	..	..	..	..	..	..	..	(iii)
TR	59.60	231.00	1 491	2 240	3 528	6 416	13 073	23 401	38 496	(i,ii)
North American Free Trade Association (NAFTA)										
CA	1.25	1.28	1.30	1.28	1.26	1.37	1.36	1.33	1.30	(i)
MX	0.02	0.16	1.66	1.94	1.72	1.91	2.01	3.28	4.01	(ii)
US	1.31	1.14	1.08	1.07	1.05	1.08	1.08	1.08	1.07	(i)
South American Countries										
AR	0.00	0.00	0.42	..	..	..	..	..	..	(iii)
BR	0.00	0.00	0.00	0.00	0.00	..	..	..	..	(iii)
CL	41.03	71.94	142.91	167.19	182.37	..	..	..	..	(iii)
VE	4.57	4.98	18.57	21.46	25.65	..	..	..	..	(iii)
Developed Asian Economies										
JP	342.00	252.00	211.00	205.00	199.00	197.71	194.80	190.06	184.25	(i)
KR	554.28	535.57	526.08	548.37	..	..	..	..	..	(iii)
SG	2.73	2.07	1.76	1.69	1.67	..	..	..	..	(iii)
TW	32.09	26.89	22.80	..	..	..	..	..	..	(iii)
Association of South-East Asian Nations (ASEAN-4)										
ID	432.29	410.87	510.15	538.32	562.93	..	..	..	..	(iii)
MY	1.68	1.36	1.17	1.11	1.15	..	..	..	..	(iii)
PH	4.57	7.73	8.90	9.93	10.07	..	..	..	..	(iii)
TH	10.88	9.08	9.80	10.08	10.11	..	..	..	..	(iii)

Table B.3.2: Purchasing Power Standard (PPS)

Annual average, 1 PPS = ... (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
China and Hong Kong										
CN	0.90	0.90	1.33	1.37	1.43	..	..	..	..	(iii)
HK	5.42	5.15	6.07	6.21	6.38	..	..	..	..	(iii)
Other Asian Countries										
PK	4.29	4.43	4.96	5.45	5.77	..	..	..	..	(iii)
IN	3.80	3.71	4.48	4.85	5.09	..	..	..	..	(iii)
Oceania										
AU	1.36	1.36	1.50	1.47	1.43	1.46	1.45	1.45	1.45	(ii)
NZ	1.25	1.43	1.74	1.69	1.61	1.63	1.63	1.64	1.62	(ii)
Other Countries										
IL	0.01	0.99	2.31	2.59	2.75	..	..	..	..	(iii)
ZA	0.92	1.26	1.93	2.08	2.22	..	..	..	..	(iii)
Mediterranean Countries										
AL	..	..	..	..	..	..	..	..	..
CY	0.41	0.39	0.39	0.38	0.38	..	..	..	..	(iii)
DZ	5.00	5.15	7.84	10.75	12.85	..	..	..	..	(iii)
EG	0.41	0.42	0.75	0.87	1.00	..	..	..	..	(ii)
IL	0.01	0.99	2.31	2.59	2.75	..	..	..	..	(iii)
LB	..	..	..	..	..	..	..	..	..
MA	3.43	3.42	3.61	3.61	3.50	..	..	..	..	(ii)
MT	0.41	0.30	..	..	..	..	..	..	..	(ii)
SY	2.26	2.16	5.07	5.32	..	..	..	..	..	(iii)
TN	0.37	0.39	0.43	0.45	0.46	..	..	..	..	(ii)
TR	59.60	231.00	1 491	2 240	3 528	6 416	13 073	23 401	38 496	(i,ii)

Notes

a Break in series because of unification

Source: (i) Eurostat

(ii) OECD

(iii) Penn World Table 5.6

(iv) European Comparison Program

Table B.4.1: Population

Mid-year estimates in 1000's a

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	Source
European Union (EU)											
	355 268	358 788	364 497	366 217	367 991	369 718	370 974	372 099	372 654	373 433	
B	9 847	9 858	9 967	10 004	10 045	10 084	10 116	10 137	10 143	10 188	(i)
DK	5 123	5 114	5 140	5 154	5 170	5 189	5 205	5 228	5 251	5 248	(i)
D	78 305	77 670	79 365	79 984	80 594	81 179	81 422	81 661	81 817	82 190	(i)
DE	61 566	61 024	63 254	64 074	64 865	65 534	65 858	..	..	..	(i)
DD	16 739	16 646	16 111	15 910	15 730	15 645	15 564	..	..	..	(i)
EL	9 643	9 934	10 160	10 247	10 322	10 379	10 426	10 454	10 465	10 522	(i)
E	37 386	38 408	38 840	38 920	39 008	39 086	39 149	39 210	39 242	39 718	(i)
F	53 880	55 284	56 735	57 055	57 374	57 654	57 900	58 138	58 256	58 543	(i)
IRL	3 401	3 540	3 506	3 526	3 549	3 563	3 571	3 598	3 616	3 559	(i)
I	56 434	56 593	56 719	56 751	56 859	57 049	57 204	57 301	57 333	57 236	(i)
L	364	367	382	387	393	398	404	410	413	417	(i)
NL	14 150	14 492	14 952	15 070	15 184	15 290	15 383	15 459	15 494	15 661	(i)
A	7 549	7 578	7 729	7 813	7 914	7 991	8 030	8 047	8 055	8 161	(i)
P	9 766	10 011	9 896	9 867	9 862	9 876	9 902	9 916	9 921	9 803	(i)
FIN	4 780	4 902	4 986	5 014	5 042	5 066	5 088	5 108	5 117	5 142	(i)
S	8 310	8 350	8 559	8 617	8 668	8 719	8 781	8 827	8 837	8 844	(i)
UK	56 330	56 685	57 561	57 808	58 006	58 191	58 395	58 606	58 694	58 201	(i)
European Free Trade Association (EFTA)											
	10 633	10 864	11 209	11 312	11 423	11 514	11 596	11 667	11 700	11 915	
IS	228	241	255	258	261	264	266	267	268	274	(i)
NO	4 086	4 153	4 241	4 262	4 286	4 312	4 337	4 359	4 370	4 364	(i)
CH	6 319	6 470	6 712	6 792	6 875	6 938	6 994	7 041	7 062	7 277	(i)
Central European Free Trade Association (CEFTA)											
	61 561	63 281	64 145	64 183	64 307	64 447	64 485	64 518	64 511	64 217	
CZ	10 327	10 337	10 363	10 309	10 318	10 331	10 333	10 327	10 321	10 238	(ii)
SK	4 945	5 162	5 298	5 283	5 300	5 318	5 347	5 362	5 368	5 354	(ii)
CS	15 311	15 499	15 661	15 583	15 731	15 770	..	..	..	..	(ii)
HU	10 711	10 579	10 365	10 346	10 324	10 294	10 261	10 234	10 212	9 989	(ii)
PL <i>b</i>	35 578	37 203	38 119	38 245	38 365	38 505	38 544	38 595	38 609	38 636	(ii)
Other European Countries											
	341 077	275 807	288 048	289 739	290 659	291 794	292 269	292 534	292 601	292 941	
BG	8 862	8 960	8 991	8 982	8 540	8 472	8 443	8 406	8 385	8 428	(ii)
RO	22 201	22 725	23 207	23 185	22 789	22 755	22 736	22 704	22 696	22 606	(ii)
RU	..	143 033	147 913	148 245	148 689	148 520	147 997	148 140	147 740	147 709	(ii,iii)
UA	50 043	50 858	51 839	52 001	52 057	52 179	51 910	51 640	51 090	51 424	(ii,iii)
SU	265 542	..	..	..	..	..	..	..	..	..	(ii)
TR	44 472	50 231	56 098	57 326	58 584	59 868	61 183	61 644	62 690	62 774	(ii)
North American Free Trade Association (NAFTA)											
	321 455	341 595	362 662	368 642	373 436	378 249	382 597	382 851	391 824	395 870	
CA	24 043	25 165	26 584	28 118	28 436	28 755	29 248	29 608	29 960	29 942	(ii,iii)
MX	69 655	77 938	86 154	87 836	89 538	91 261	93 008	90 487	96 580	94 280	(ii)
US <i>c</i>	227 757	238 492	249 924	252 688	255 462	258 233	260 341	262 755	265 284	271 648	(ii,iv)
South American Countries											
	175 692	191 749	209 586	213 043	216 460	219 730	223 076	226 055	230 220	236 204	
AR	28 237	30 325	32 547	32 966	33 375	33 671	34 180	34 590	35 220	35 671	(ii)
BR <i>d</i>	121 286	131 985	144 541	146 904	149 237	151 534	153 725	155 820	157 870	163 132	(ii)
CL	11 145	12 122	13 173	13 386	13 599	13 813	13 994	14 210	14 420	14 624	(ii)
VE <i>d</i>	15 024	17 317	19 325	19 787	20 249	20 712	21 177	21 435	22 710	22 777	(ii)
Developed Asian Economies											
	174 987	183 261	189 341	190 407	191 460	191 431	193 182	194 097	195 790	196 500	
JP <i>e</i>	116 807	120 837	123 537	123 921	124 324	123 653	124 764	125 004	125 760	125 638	(ii,iii)
KR	38 124	40 806	42 869	43 268	43 663	44 056	44 453	44 851	45 540	45 717	(ii)
SG	2 414	2 483	2 705	2 763	2 818	2 874	2 930	2 987	3 040	3 439	(ii)
TW	17 642	19 135	20 230	20 455	20 655	20 848	21 035	21 256	21 450	..	(iv)

Table B.4.1: Population

Mid-year estimates in 1000's a (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	Source
Association of South-East Asian Nations (ASEAN-4)											
	256 222	286 559	315 156	320 912	326 674	332 416	339 728	344 203	349 280	354 380	
ID	147 490	164 630	179 830	182 940	186 043	189 136	192 217	193 756	196 810	203 479	(ii)
MY	13 697	15 681	17 764	18 181	18 612	19 047	19 489	19 975	20 570	21 018	(ii)
PH	48 317	54 668	61 480	62 868	64 259	65 649	68 626	70 267	71 900	70 724	(ii)
TH	46 718	51 580	56 082	56 923	57 760	58 584	59 396	60 206	60 000	59 159	(ii)
China and Hong Kong											
	1 001 198	1 075 631	1 161 010	1 175 807	1 189 429	1 202 279	1 214 902	1 227 690	1 238 390	1 249 987	
CN ^f	996 135	1 070 175	1 155 305	1 170 052	1 183 617	1 196 360	1 208 841	1 221 500	1 232 080	1 243 738	(ii)
HK	5 063	5 456	5 705	5 755	5 812	5 919	6 061	6 190	6 310	6 249	(ii)
Other Asian Countries											
	757 581	847 091	946 746	967 185	986 925	1 006 712	1 045 180	1 065 548	1 078 730	1 104 009	
PK ^g	82 581	96 180	112 049	115 524	119 107	122 802	126 610	129 808	134 150	143 831	(ii)
IN ^h	675 000	750 911	834 697	851 661	867 818	883 910	918 570	935 740	944 580	960 178	(ii)
Oceania											
	17 808	19 035	20 428	20 690	20 926	21 112	21 336	21 597	21 860	21 891	
AU	14 695	15 788	17 065	17 284	17 483	17 661	17 843	18 054	18 290	18 250	(ii)
NZ ⁱ	3 113	3 247	3 363	3 406	3 443	3 451	3 493	3 543	3 570	3 641	(ii)
Other Countries											
	32 162	37 276	41 726	42 859	44 901	44 915	45 835	46 775	48 090	49 118	
IL ^j	3 878	4 233	4 660	4 946	5 123	5 256	5 399	5 539	5 700	5 781	(ii)
ZA	28 284	33 043	37 066	37 913	39 778	39 659	40 436	41 236	42 390	43 337	(ii)
Mediterranean Countries											
	150 559	168 764	189 983	194 431	199 039	203 641	208 588	212 663	217 100	221 992	
AL	2 671	2 957	3 256	3 255	3 363	3 389	3 414	3 645	3 400	3 422	(ii)
CY	611	647	681	693	706	718	734	742	760	767	(ii)
DZ	18 666	21 850	25 012	25 533	26 127	26 722	27 561	28 243	29 170	29 473	(ii)
EG	42 126	46 473	52 691	53 918	55 163	56 489	57 851	59 226	60 600	64 466	(ii)
IL ^j	3 878	4 233	4 660	4 946	5 123	5 256	5 399	5 539	5 700	5 781	(ii)
LB ^k	2 670	2 668	2 555	2 610	2 698	2 806	2 915	3 010	3 080	3 144	(ii)
MA	20 050	21 836	24 487	25 020	25 547	26 069	26 590	27 111	27 620	27 518	(ii)
MT ^l	319	340	354	358	363	361	364	366	370	371	(ii)
SY ^m	8 704	10 267	12 116	12 529	12 958	13 393	13 844	14 314	14 620	14 951	(ii)
TN	6 392	7 261	8 074	8 243	8 407	8 570	8 733	8 822	9 090	9 325	(ii)
TR	44 472	50 231	56 098	57 326	58 584	59 868	61 183	61 644	62 690	62 774	(ii)

Notes^a Except for US, 1996 data are not mid-year estimates, but beginning-of-year data^b Excluding civilian aliens within the country, and including civilian nationals temporarily outside the country^c Excluding civilian citizens absent from country for extended period of time^d Excluding Indian jungle population^e Excluding diplomatic personnel outside the country, and foreign military and civilian personnel and their dependants stationed in the area^f Taiwan included^g Excluding data for Jammu and Kashmir, the final status of which has not been determined, Junagardh, Manavadar, Gilgit and Baltistan^h Including data for the Indian-held part of Jammu and Kashmir, the final status of which has not been determinedⁱ Excluding diplomatic personnel and armed forces stationed outside the country; also excluding alien armed within the country^j Including data for East Jerusalem and Israeli residents in certain other territories under occupation by Israeli military forces since June 1967^k Lebanese nationals on population register, incl. those living outside the country. Excl. non-residents foreigners and registered Palestinian refugees^l Including civilian nationals temporarily outside the country^m Including Palestinian refugees**Source: Data for 1997 are UN estimates**

(i) Eurostat

(iii) IMF

(ii) UN

(iv) national source

Table B.4.2: 15 to 19 Year Old Population

As a Percentage of Total Population

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
European Union (EU)										
	8.24	8.11	7.17	6.97	6.73	6.54	6.41	6.31	6.28	
B	8.09	7.42	6.73	6.50	6.29	6.14	6.06	6.05	6.10	(i)
DK	7.63	7.79	7.14	7.16	6.97	6.72	6.53	6.30	6.02	(i)
D	8.43	8.07	5.83	5.48	5.22	5.14	5.16	5.22	5.37	(i)
DE	8.39	8.23	5.80	5.45	5.20	5.05	5.01	4.99	..	(i)
DD	..	..	..	..	..	..	..	..	..
EL	7.56	7.78	7.50	7.47	7.46	7.44	7.42	7.35	7.28	(i)
E	8.51	8.62	8.42	8.56	8.53	8.46	8.33	8.13	7.88	(i)
F	8.06	7.81	7.65	7.42	7.11	6.85	6.62	6.52	6.59	(i)
IRL	9.45	9.38	9.35	9.47	9.30	9.01	8.96	9.16	9.49	(i)
I	8.02	8.20	7.72	7.60	7.37	7.10	6.81	6.45	6.13	(i)
L	7.65	7.20	5.92	5.72	5.52	5.43	5.41	5.44	5.45	(i)
NL	8.85	8.54	7.44	6.98	6.59	6.27	6.10	5.98	5.96	(i)
A	8.67	8.37	6.86	6.58	6.26	6.01	5.84	5.70	5.70	(i)
P	..	8.46	8.43	8.57	8.62	8.54	8.37	8.14	7.85	(i)
FIN	8.04	7.28	6.06	6.07	6.16	6.27	6.41	6.43	6.39	(i)
S	6.73	7.10	6.64	6.56	6.37	6.17	5.97	5.81	5.73	(i)
UK	8.25	8.13	6.97	6.63	6.30	6.01	5.88	5.89	5.96	(i)
European Free Trade Association (EFTA)										
	7.93	7.86	6.93	6.70	6.42	6.19	6.03	5.92	7.02	
IS	9.97	8.88	8.31	8.33	8.28	7.96	7.74	7.82	7.89	(i)
NO	7.63	8.07	7.54	7.33	7.03	6.69	6.46	6.24	6.11	(i)
CH	..	7.68	6.49	6.24	5.96	5.81	5.70	5.64	5.66	(i)
Central European Free Trade Association (CEFTA)										
	7.33	6.77	7.66	7.94	8.17	8.33	8.36	8.38	..	
CZ	6.69	6.66	8.14	8.45	8.74	8.80	..	8.45	..	(ii)
SK	8.18	7.33	8.16	8.42	..	..	..	8.80	..	(ii)
HU	6.03	6.67	7.62	8.03	8.33	8.52	..	8.15	..	(ii)
PL	7.79	6.74	7.47	7.71	7.91	..	..	8.36	..	(ii)
Other European Countries										
	8.26	7.29	7.61	..	..	..	..	7.86	..	
BG	7.02	6.79	7.35	..	7.44	..	..	7.48	..	(ii)
RO	6.44	8.78	8.10	8.13	8.51	8.72	..	8.45	..	(ii)
RU	8.30	6.52	6.89	..	..	..	..	7.30	..	(ii)
UA	7.88	6.74	7.12	..	..	..	..	7.06	..	(ii)
TR	11.10	10.70	11.01	..	..	..	..	10.74	..	(ii)
North American Free Trade Association (NAFTA)										
	9.76	8.65	8.28	8.03	7.93	7.88	7.90	7.90	8.01	
CA	9.86	7.76	6.99	6.85	6.77	6.72	6.71	6.56	..	(ii)
MX	11.07	11.64	12.00	..	..	..	..	11.29	..	(ii)
US	9.34	7.77	7.14	6.82	6.73	6.70	6.77	6.88	7.03	(ii)
South American Countries										
	10.37	9.97	9.67	9.90	9.80	9.85	9.96	9.89	..	
AR	8.27	8.01	8.61	8.57	..	8.75	..	9.63	..	(ii)
BR	10.70	10.28	9.87	10.23	10.09	..	10.19	10.00	..	(ii)
CL	10.99	10.32	9.37	9.14	8.89	..	8.69	8.53	..	(ii)
VE	11.19	10.80	10.15	..	10.19	..	..	10.36	..	(ii)
Developed Asian Economies										
	8.62	8.45	8.71	8.53	8.27	7.98	7.72	7.58	..	
JP	7.07	7.42	8.10	7.98	7.73	7.43	7.09	6.89	..	(ii)
KR	11.92	10.74	10.41	..	9.54	9.11	8.86	8.79	..	(ii)
SG	11.91	9.19	8.18	7.86	7.56	7.11	6.85	6.72	..	(ii)
TW	11.36	10.00	8.91	8.86	8.94	9.02	9.18	..	..	(iii)

Table B.4.2: 15 to 19 Year Old Population
As a Percentage of Total Population (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996	Source
Association of South-East Asian Nations (ASEAN-4)										
	10.72	10.58	10.63	10.67	10.70	10.72	10.70	10.68	..	
ID	10.41	10.10	10.56	..	..	10.89	..	11.01	..	(ii)
MY	11.44	10.68	10.35	10.14	10.00	9.83	..	9.06	..	(ii)
PH	10.93	10.73	10.64	10.65	..	..	10.56	10.56	..	(ii)
TH	11.24	11.90	10.93	10.88	10.74	10.61	10.47	10.31	..	(ii)
China and Hong Kong										
	10.84	12.12	10.87	..	..	..	..	8.02	..	
CN	10.83	12.14	10.88	..	..	..	..	8.03	..	(ii)
HK	12.00	8.41	7.54	7.47	7.21	6.92	6.66	6.49	..	(ii)
Other Asian Countries										
	10.88	10.74	10.72	..	..	..	..	9.69	..	
PK	11.18	11.08	10.13	..	..	..	..	9.48	..	(ii)
IN	10.84	10.70	10.80	10.73	..	10.29	..	9.71	..	(ii)
Oceania										
	9.07	8.68	8.31	7.89	7.66	7.42	7.24	7.09	..	
AU	8.87	8.56	8.22	7.80	7.58	7.34	7.17	7.03	..	(ii)
NZ	10.03	9.27	8.77	8.34	8.05	..	..	7.38	..	(ii)
Other Countries										
	10.31	9.74	10.23	..	..	..	..	10.11	..	
IL	8.63	8.84	9.44	9.42	9.43	9.38	9.28	9.01	..	(ii)
ZA	10.54	9.85	10.32	..	..	..	..	10.26	..	(ii)
Mediterranean Countries										
	10.83	10.53	10.41	10.68	10.63	10.59	10.65	10.71	..	
AL	11.46	10.40	10.01	9.54	8.71	8.35	8.28	7.76	..	(ii,iii)
CY	9.45	8.00	7.32	7.16	7.01	7.07	7.10	6.40	..	(ii,iii)
DZ	10.94	10.99	11.02	11.09	11.17	11.24	11.31	11.37	..	(ii)
EG	10.44	10.16	9.43	10.30	10.21	10.21	..	10.25	..	(ii)
IL	8.63	8.84	9.44	9.42	9.43	9.38	9.28	9.01	..	(ii)
LB	11.58	12.22	11.47	..	..	..	..	9.70	..	(ii)
MA	10.74	10.95	11.14	11.49	11.56	11.33	11.90	..	..	(ii,iii)
MT	8.68	6.95	7.44	..	7.62	7.65	7.72	7.65	..	(ii)
SY	11.59	9.55	9.55	..	9.55	9.56	9.56	10.93	..	(ii)
TN	11.52	11.43	10.61	10.73	10.68	10.72	10.69	10.60	..	(ii,iii)
TR	11.10	10.70	11.01	..	..	..	..	10.74	..	(ii)

Source: (i) Eurostat
(ii) UN
(iii) national source

Table B.4.3: Projections of Total Population

1000's

	2000	2010	2020	Source
European Union (EU)				
	376 958	385 334	388 058	
B	10 252	10 484	10 658	(i)
DK	5 321	5 452	5 526	(i)
D	83 123	84 854	84 670	(i)
EL	10 643	11 079	11 269	(i)
E	39 544	40 372	40 307	(i)
F	59 179	61 387	62 831	(i)
IRL	3 622	3 712	3 734	(i)
I	57 455	57 633	56 543	(i)
L	435	471	501	(i)
NL	15 868	16 659	17 204	(i)
A	8 144	8 326	8 443	(i)
P	9 993	10 293	10 513	(i)
FIN	5 178	5 290	5 350	(i)
S	8 932	9 176	9 470	(i)
UK	59 269	60 146	61 038	(i)
European Free Trade Association (EFTA)				
	12 234	12 677	12 936	
IS	278	297	311	(i)
NO	4 462	4 663	4 851	(i)
CH	7 494	7 717	7 774	(ii)
Central European Free Trade Association (CEFTA)				
	64 540	65 767	67 027	
CZ	10 346	10 444	10 551	(ii)
SK	5 468	5 707	5 921	(ii)
HU	9 940	9 678	9 469	(ii)
PL	38 786	39 938	41 086	(ii)
Other European Countries				
	294 117	301 660	305 794	
BG	8 576	8 242	7 922	(ii)
RO	22 607	22 316	21 951	(ii)
RU	144 212	143 134	140 283	(ii)
UA	50 974	50 085	49 125	(ii)
TR	67 748	77 883	86 513	(ii)
North American Free Trade Association (NAFTA)				
	408 558	449 083	488 083	
CA	31 029	33 946	36 887	(ii)
MX	102 410	117 651	130 645	(ii)
US	275 119	297 486	320 551	(ii)
South American Countries				
	250 954	286 018	316 893	
AR	36 648	40 755	44 417	(ii)
BR	174 825	199 327	220 567	(ii)
CL	15 311	17 220	18 998	(ii)
VE	24 170	28 716	32 911	(ii)

	2000	2010	2020	Source
Developed Asian Economies				
	198 788	205 016	205 825	
JP	126 472	127 152	123 973	(ii)
KR	47 149	50 764	53 293	(ii)
SG	2 967	3 144	3 295	(ii)
TW	22 200	23 956	25 264	(iii)
Association of South-East Asian Nations (ASEAN-4)				
	371 514	421 127	464 728	
ID	212 731	239 601	264 103	(ii)
MY	22 299	26 239	29 787	(ii)
PH	74 575	88 157	99 335	(ii)
TH	61 909	67 130	71 503	(ii)
China and Hong Kong				
	1 290 565	1 394 513	1 494 082	
CN	1 284 597	1 388 474	1 488 075	(ii)
HK	5 968	6 039	6 007	(ii)
Other Asian Countries				
	1 183 848	1 399 186	1 588 976	
PK	161 827	210 104	261 866	(ii)
IN	1 022 021	1 189 082	1 327 110	(ii)
Oceania				
	22 981	25 401	27 855	
AU	19 222	21 367	23 586	(ii)
NZ	3 759	4 034	4 269	(ii)
Other Countries				
	46 215	56 398	66 407	
IL	6 062	6 833	7 488	(ii)
ZA	46 215	56 398	66 407	(ii)
Mediterranean Countries				
	238 841	281 731	320 289	
AL	3 624	4 060	4 473	(ii)
CY	777	839	901	(ii)
DZ	31 158	37 489	42 786	(ii)
EG	69 146	81 490	92 015	(ii)
IL	6 062	6 833	7 488	(ii)
LB	3 289	3 742	4 193	(ii)
MA	29 637	34 196	38 526	(ii)
MT	377	399	416	(ii)
SY	17 329	23 591	30 359	(ii)
TN	9 694	11 209	12 619	(ii)
TR	67 748	77 883	86 513	(ii)

Source: (i) Eurostat
(ii) UN
(iii) national source

Table B.5.1: General Level of Employment

1000's

	1985		1990		1991		1992		1993		1994		1995		Source
	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
European Union (EU) a	133 195	38.1	144 002	39.7	152 235	40.5	149 857	40.8	147 738	41.1	147 275	41.4	148 406	41.5	
B	3 512	35.1	3 625	37.5	3 719	38.4	3 770	39.4	3 744	39.9	3 748	39.9	3 793	40.0	(i)
DK	2 539	44.9	2 656	45.9	2 635	46.1	2 637	46.4	2 567	46.7	2 537	45.8	2 601	44.6	(i)
D	26 167	39.0	29 001	40.4	37 007	42.0	36 528	41.7	36 111	41.7	35 840	42.0	35 782	42.2	(i)
DE	26 167	39.0	29 001	40.4	29 238	40.6	29 715	41.0	29 525	41.1	29 197	41.4	29 054	41.6	(i)
DD	8 910	49.0	..	..	7 769	47.1	6 813	45.0	6 586	44.8	6 643	44.5	6 728	45.0	(ii,i)
EL	3 589	33.9	3 719	35.2	3 633	33.7	3 680	34.8	3 715	35.0	3 786	35.3	3 821	35.9	(i)
E	10 595	29.0	12 551	31.9	12 622	32.3	12 458	32.9	11 868	33.6	11 728	34.0	12 027	34.5	(ii,i)
F	21 297	41.6	21 874	42.5	22 115	43.1	22 021	43.3	21 908	44.0	21 720	44.2	22 057	44.3	(i)
IRL	1 069	30.8	1 135	33.2	1 134	33.8	1 149	35.3	1 155	36.5	1 207	37.2	1 262	37.6	(i)
I	20 583	32.2	21 221	34.2	21 520	34.8	20 620	34.9	20 321	34.9	20 024	35.3	19 943	35.5	(i)
L	148	34.1	157	34.5	162	35.4	165	36.9	165	36.1	165	36.9	162	35.5	(i)
NL	5 124	34.1	6 275	37.7	6 420	38.4	6 614	39.4	6 640	40.0	6 707	40.7	6 782	40.7	(i)
A	3 235	39.5	3 420	40.8	3 482	41.0	3 547	41.5	3 576	41.9	3 742	42.6	3 675	43.2	(ii,i)
P	4 290	40.3	4 649	42.0	4 839	43.0	4 509	44.1	4 464	44.2	4 440	44.5	4 417	44.6	(ii,i)
FIN	2 466	47.6	2 488	47.4	2 366	47.9	2 199	48.2	2 064	48.1	2 046	47.9	2 016	48.4	(ii,i)
S	4 299	47.0	4 449	48.0	4 373	48.1	4 195	48.5	3 964	48.9	3 928	48.7	4 134	48.1	(ii,i)
UK	24 282	41.6	26 783	43.2	26 207	43.7	25 766	44.4	25 478	45.0	25 657	44.8	25 936	44.6	(i)
European Free Trade Association (EFTA)	5 500	39.3	6 000	41.3	6 013	41.6	5 946	41.9	5 925	42.1	5 949	42.4	6 004	42.4	
IS	..	..	..	..	137	45.6	137	45.7	137	46.3	138	46.6	142	46.7	(ii)
NO	2 014	42.9	2 030	45.1	2 010	45.5	2 004	45.6	2 004	45.8	2 035	45.8	2 079	45.8	(ii)
CH	3 354	36.9	3 821	39.1	3 866	39.5	3 805	39.7	3 784	40.0	3 776	40.4	3 783	40.4	(ii)
Central European Free Trade Association (CEFTA)	31 258	47.0	..	..	..	..	..	..	25 691	45.5	25 647	45.4	25 699	45.2	
CZ	..	..	..	..	..	..	..	..	5 011	46.2	5 045	46.3	5 102	46.0	(ii)
SK <i>bc</i>	2 425	45.4	2 459	44.5	2 152	43.3	2 175	41.9	2 081	45.8	2 103	44.3	2 147	44.4	(ii)
CS <i>bd</i>	7 606	46.3	..	..	..	..	..	..	..	..	..	..	..	..	(ii)
HU <i>d</i>	5 121	48.2	4 980	48.4	4 712	48.8	4 083	45.7	3 827	45.7	3 752	45.2	3 679	44.3	(ii)
PL	18 531	48.4	17 321	46.5	16 285	45.7	15 462	45.7	14 772	45.2	14 747	45.3	14 771	45.2	(ii)
Other European Countries	126 824	..	130 094	..	126 769	..	..	..	..	..	..	..	..	..
BG <i>ce</i>	4 460	..	4 097	..	3 564	..	3 274	..	3 222	..	3 242	..	3 311	..	(ii)
RO <i>c</i>	10 586	44.9	10 840	46.1	10 786	46.9	10 458	46.7	10 062	46.2	10 914	46.2	11 152	46.0	(ii)
RU	74 937	..	75 325	..	73 848	..	72 071	48.6	70 852	48.4	68 484	47.2	67 100	46.8	(ii)
UA <i>bde</i>	20 679	..	19 886	52.8	19 119	53.3	..	..	..	..	..	..	..	..	(ii)
SU <i>bde</i>	130 303	..	124 971	..	..	..	..	..	..	..	..	..	..	..	(ii)
TR	16 162	30.2	19 946	31.5	19 452	31.5	19 959	30.9	19 905	30.8	20 396	28.8	21 378	30.3	(ii)
North American Free Trade Association (NAFTA)	144 600	41.8	160 500	42.5	160 327	42.6	162 100	42.7	165 154	42.7	169 700	43.1	172 287	43.2	
CA	11 742	42.4	13 165	44.4	12 916	45.0	12 842	45.2	13 015	45.2	13 292	45.2	13 506	45.2	(ii)
MX	..	..	..	..	30 534	30.4	..	..	32 833	30.7	..	..	33 881	32.0	(ii)
US	107 150	44.1	117 914	45.4	116 877	45.6	117 598	45.7	119 306	45.8	123 060	46.0	124 900	46.1	(ii)
South American Countries f	..	..	..	..	..	..	..	..	..	..	..	..	..	..
AR <i>g</i>	..	..	4 373	36.7	4 333	36.1	4 496	36.7	4 609	37.6	4 386	37.1	4 157	38.1	(ii)
BR <i>h</i>	53 761	33.4	62 100	35.6	..	..	65 395	38.8	66 570	39.0	..	..	..	..	(ii)
CL	3 721	29.6	4 460	31.0	4 540	30.5	4 773	31.7	4 986	32.3	4 988	32.4	5 026	32.2	(ii)
VE	5 106	27.7	6 402	31.4	6 728	32.2	6 930	32.3	7 035	31.5	7 309	31.1	7 670	32.5	(ii)
Developed Asian Economies	81 703	39.2	90 395	40.3	92 265	40.3	93 529	40.3	94 090	40.2	94 955	40.3	95 693	40.2	
JP	58 070	39.7	62 490	40.6	63 690	40.7	64 360	40.7	64 500	40.5	64 530	40.5	64 570	40.5	(ii)
KR	14 970	39.0	18 085	40.8	18 612	40.5	18 961	40.3	19 253	40.2	19 837	40.4	20 377	40.4	(ii)
SG	1 235	36.4	1 537	40.4	1 524	39.8	1 576	40.1	1 592	40.2	1 649	40.2	1 701	38.6	(ii)
TW	7 428	36.5	8 283	37.5	8 439	37.5	8 632	37.7	8 745	38.0	8 939	38.3	9 045	38.6	(iii)

Table B.5.1: General Level of Employment

1000's (continued)

	1985		1990		1991		1992		1993		1994		1995		Source
	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
Association of South-East Asian Nations (ASEAN-4)															
	114 290	38.4	135 912	40.0	137 400	39.5	141 454	40.0	144 300	40.1	147 400	40.2	151 100	40,5	
ID	62 457	36.0	75 851	38.8	76 423	38.2	78 104	39.0	..	..	..	..	..	..	(ii)
MY	5 653	34.5	6 685	35.5	..	..	7 048	35.4	7 383	34.3	..	..	7 645	33.9	(ii)
PH	20 327	37.2	22 532	36.3	22 979	36.3	23 917	36.7	24 443	36.7	25 166	36.5	25 698	37.0	(ii)
TH	25 853	46.0	30 844	46.6	31 138	45.9	32 385	46.0	32 153	45.7	32 095	45.9	..	..	(ii)
China and Hong Kong															
	501 273	36.4	570 112	37.7	586 389	37.9	597 058	35.9	605 016	37.3	617 605	38.0	632 400	38,1	
CN <i>i</i>	498 730	36.4	567 400	37.7	583 640	37.9	594 320	35.9	602 200	37.3	614 690	38.0	..	..	(ii)
HK	2 543	36.6	2 712	35.7	2 749	37.5	2 738	36.8	2 816	36.9	2 915	37.5	2 971	38.0	(ii)
Other Asian Countries <i>f</i>															
	
PK	26 961	9.6	30 822	11.7	29 828	12.6	31 050	14.4	32 108	14.0	33 047	14.6	..	..	(ii)
IN <i>bj</i>	24 578	12.9	26 353	13.8	26 733	14.1	27 056	14.4	27 177	14.8	27 375	15.2	27 525	15.4	(ii)
Oceania															
	8 200	39.1	9 340	41.8	9 136	42.3	9 104	42.6	9 175	42.7	9 480	42.9	9 868	43,2	
AU	6 698	38.4	7 859	41.5	7 676	42.0	7 637	42.3	7 680	42.4	7 921	42.6	8 235	43.1	(ii)
NZ	..	..	1 481	43.6	1 461	44.0	1 467	44.0	1 496	43.9	1 560	44.2	1 633	44.1	(ii)
Other Countries															
	
IL <i>k</i>	1 349	38.0	1 492	39.8	1 583	39.8	1 650	40.5	1 751	41.0	1 871	41.7	1 965	42.5	(ii)
ZA	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mediterranean Countries															
	
AL <i>bce</i>	776	40.4	905	40.6	851	41.9	..	..	..	..	..	..	..	..	(ii)
CY	222	37.1	257	38.7	258	38.1	269	39.2	269	38.3	274	39.2	285	39.3	(ii)
DZ	3 884	8.4	4 282	7.8	4 344	8.3	..	..	..	..	4 325	..	4 465	..	(ii)
EG	..	..	14 361	23.7	13 827	20.6	14 399	22.0	14 703	20.0	15 241	20.3	14 879	..	(ii), (iii)
IL <i>k</i>	1 349	38.0	1 492	39.8	1 583	39.8	1 650	40.5	1 751	41.0	1 871	41.7	1 965	42.5	(ii)
LB	982	..	..	..	..	..	..	..	..	..	..	..	1 200	..	(iii)
MA <i>l</i>	3 005	..	3 294	24.8	3 400	23.8	3 494	21.8	..	..	..	..	..	..	(ii), (iii)
MT	113	24.6	127	25.8	130	26.3	132	26.3	132	26.8	139	..	145	..	(ii), (iii)
SY	..	..	..	..	3 250	16.6	..	..	..	..	..	..	..	..	(ii)
TNe	1 750	..	1 946	..	1 992	..	2 029	..	2 080	..	2 320	..	..	..	(iii)
TR	16 162	30.2	19 946	31.5	19 452	31.5	19 959	30.9	19 905	30.8	20 396	28.8	21 378	30.3	(ii)

Notes*a* The German part of the total before 1991 refers to the Federal Republic of Germany prior to 3.10.1990*b* Data (before the last break) are not from labour force surveys but from establishment surveys*c* Prior to 1992 state and cooperative sector*d* Prior to 1992 total employment for the whole national economy*e* Employees only*f* No group totals because of an incomplete coverage for one of the countries*g* Gran Buenos Aires*h* Excluding rural population of Rondônia, Acre, Amazonas, Roraima, Pará and Amapá*i* Whole national economy, excluding armed forces and reemployed retired persons*j* Public sector and establishments of non-agric. private sector with 10 or more employed; employees and working proprietors*k* Prior to 1995: including workers from the Judea, Samaria and Gaza areas*l* Urban areas**Source: (i) Eurostat, Community Labour Force Survey****(ii) ILO****(iii) national source**

Table B.5.2: General Level of Unemployment

1000's

	1985		1990		1991		1992		1993		1994		1995		Source
	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
European Union (EU) a															
	15 204	45.8	12 539	52.5	13 798	50.9	14 928	49.4	17 338	47.2	18 610	47.5	17 766	49.0	
B	449	59.6	283	61.8	279	60.9	271	57.5	329	55.2	400	53.0	391	54.1	(i)
DK	215	55.6	242	49.5	264	51.3	262	51.1	308	48.5	222	51.8	196	56.2	(i)
D	1 932	48.9	1 491	51.2	2 078	52.2	2 466	55.4	3 002	51.6	3 427	50.5	3 179	50.7	(i)
DE	1 932	48.9	1 491	51.2	1 250	48.2	1 286	47.0	1 787	43.8	2 168	43.3	2 049	43.9	(i)
DD	..	..	..	..	828	58.1	1 180	64.6	1 215	63.1	1 259	62.8	1 130	62.8	(i)
EL	304	53.3	282	61.8	303	59.9	313	60.4	350	58.5	368	57.5	381	57.5	(i)
E	2 939	34.5	2 439	52.3	2 391	51.5	2 684	51.1	3 395	47.0	3 760	48.5	3 533	50.9	(ii.i)
F	2 436	52.6	2 259	56.9	2 232	56.3	2 514	56.0	2 811	53.3	3 149	52.0	2 977	54.0	(i)
IRL	234	33.7	186	35.7	213	35.9	203	36.1	213	37.2	206	37.6	172	37.9	(i)
I	2 154	56.0	2 314	58.5	2 427	57.7	2 151	54.6	2 332	52.6	2 560	50.9	2 663	51.3	(i)
L	5	51.1	3	50.0	2	50.0	3	50.0	4	48.7	6	45.8	5	54.2	(i)
NL	601	41.2	526	55.3	508	53.7	389	56.7	445	49.7	517	46.2	523	50.0	(i)
A	121	38.9	115	45.1	125	43.5	132	43.8	159	44.5	138	47.5	167	49.0	(ii.i)
P	411	56.0	229	59.8	199	62.8	187	53.1	250	52.8	320	52.1	336	49.5	(ii.i)
FIN	129	43.4	88	38.6	193	35.8	328	38.1	444	41.4	456	43.0	413	45.5	(ii.i)
S	125	48.0	75	48.0	133	41.4	233	37.8	356	38.5	340	40.6	364	43.4	(ii.i)
UK	3 151	39.6	2 008	40.9	2 451	37.3	2 792	32.8	2 941	32.7	2 741	33.5	2 468	34.8	(i)
European Free Trade Association (EFTA)															
	..	..	..	..	188	48.5	242	46.7	279	47.7	271	45.0	241	47.4	
IS	..	..	..	..	4	52.8	6	51.6	8	50.0	8	49.4	7	47.2	(ii)
NO	53	52.8	112	41.1	116	41.4	126	39.7	127	39.4	116	39.7	107	43.0	(ii)
CH	..	..	..	..	68	60.3	110	54.5	144	54.9	147	49.0	127	51.2	(ii)
Central European Free Trade Association (CEFTA)															
	..	..	..	..	..	..	..	..	3 619	48.9	3 361	49.9	3 155	48.4	
CZ	..	..	..	..	..	..	..	..	200	56.4	202	52.8	181	53.4	(ii)
SK	..	..	..	..	..	..	..	..	306	43.9	334	46.1	325	47.1	(ii)
CS	..	..	..	..	..	..	..	..	..	..	..	..	..	..
HU	..	..	..	..	..	..	444	40.1	519	39.1	451	39.1	417	37.2	(ii)
PL b	..	..	1 126	50.9	2 156	52.6	2 394	51.0	2 595	50.8	2 375	52.2	2 233	50.2	(ii)
Other European Countries															
	
BG b	..	..	65	65.2	419	54.5	577	52.4	626	52.3	488	54.3	424	55.6	(ii)
RO b	..	..	..	..	337	61.8	929	60.6	1 133	..	971	49.7	968	49.6	(ii)
RU	..	..	..	..	..	..	3 594	49.4	4 160	48.2	5 478	46.2	6 040	45.8	(ii)
UA	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SU	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TR	2 040	29.9	1 615	31.7	1 787	27.2	1 745	29.1	1 722	28.9	1 740	30.0	1 522	30.9	(ii)
North American Free Trade Association (NAFTA)															
	10 400	45.2	8 800	44.5	10 613	42.9	11 800	42.5	11 202	43.0	10 800	43.9	10 503	44.0	
CA	1 381	43.0	1 164	44.2	1 492	42.0	1 640	41.1	1 649	42.3	1 541	42.6	1 422	43.7	(ii)
MX	..	..	..	..	695	46.3	..	..	819	39.5	..	..	1 677	34.4	(ii)
US	8 312	45.6	6 874	44.7	8 426	42.8	9 384	42.7	8 734	43.5	7 996	45.4	7 404	46.2	(ii)
South American Countries c															
	
AR d	216	33.9	441	42.5	266	38.4	321	38.9	520	48.5	603	45.4	964	47.3	(ii)
BR e	1 875	37.5	2 368	33.2	..	..	4 574	48.5	4 396	47.5	..	..	..	..	(ii)
CL	517	32.9	269	31.2	254	33.5	217	39.2	234	36.8	311	37.7	248	36.2	(ii)
VE	767	24.7	742	27.8	701	31.7	580	28.4	498	26.4	681	32.1	875	41.8	(ii)
Developed Asian Economies															
	2 457	35.5	1 960	38.9	1 956	40.9	2 060	40.2	2 382	40.2	2 595	39.8	2 731	40.0	
JP	1 560	40.4	1 340	42.5	1 360	43.4	1 420	42.3	1 660	42.8	1 920	41.7	2 100	41.4	(ii)
KR	622	22.7	454	29.3	436	34.2	465	34.4	550	31.8	489	31.7	419	33.2	(ii)
SG	53	35.9	26	31.8	30	37.7	43	39.2	44	42.3	44	43.2	47	39.5	(ii)
TW	222	36.5	140	37.1	130	37.7	132	39.4	128	42.2	142	40.8	165	38.8	(iii)

Table B.5.2: General Level of Unemployment

1000's (continued)

	1985		1990		1991		1992		1993		1994		1995		Source
	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	total	% fem.	
Association of South-East Asian Nations (ASEAN-4)															
	4 200	..	5 011	..	5 482	..	5 192	..	..	..	..	..	..	..
ID	1 368	34.4	1 952	40.8	2 032	43.6	2 199	41.2	..	..	..	..	..	..	(ii)
MY	..	..	356	..	314	..	274	..	231	..	228	..	225	..	(ii)
PH	1 316	51.1	1 993	44.8	2 267	43.1	2 263	42.4	2 379	41.8	2 317	41.2	2 342	42.2	(ii)
TH	995	54.1	710	51.1	869	59.7	456	50.9	494	56.0	..	..	..	..	(ii)
China and Hong Kong c															
	
CN <i>f</i>	2 385	49.7	3 832	47.3	3 522	47.6	3 603	47.2	4 201	45.8	4 764	36.8	..	..	(ii)
HK	84	30.0	37	36.5	50	33.0	55	35.5	57	36.4	57	32.7	98	34.3	(ii)
Other Asian Countries															
	25 903	16.5	35 628	18.9	38 299	21.1	38 686	21.7	37 871	22.1	38 371	22.4	38 500	22.3	
PK	1 042	3.6	996	3.2	1 999	38.1	1 928	38.5	1 595	32.5	1 679	31.9	..	..	(ii)
IN <i>b</i>	24 861	17.0	34 632	19.3	36 300	20.1	36 758	20.8	36 276	21.7	36 692	21.9	36 742	21.8	(ii)
Oceania															
	..	..	709	42.7	982	40.0	1 094	39.0	1 096	39.1	994	41.0	876	41.1	
AU	603	41.0	585	43.2	815	39.9	925	38.8	939	38.9	856	40.9	766	40.6	(ii)
NZ	..	..	125	40.5	167	40.4	169	40.4	157	40.6	138	41.5	110	44.5	(ii)
Other Countries c															
	
IL <i>g</i>	97	41.3	158	48.0	187	52.0	208	52.0	195	50.6	158	54.7	145	53.8	(ii)
ZA <i>bh</i>	..	..	111	30.1	248	28.7	288	30.1	313	29.6	271	31.9	273	31.6	(ii)
Mediterranean Countries															
	
AL	94	..	151	..	140	..	..	..	..	..	..	..	..	..	(ii)
CY <i>b</i>	8	44.4	5	51.4	8	54.6	5	54.2	8	57.7	8	54.0	8	54.8	(ii)
DZ	..	..	1 156	7.5	1 261	8.4	1 482	9.0	..	..	..	..	..	..	(ii)
EG	..	..	1 347	55.3	1 463	52.7	1 416	45.7	1 801	46.9	1 877	48.7	..	..	(ii)
IL <i>g</i>	97	41.3	158	48.0	187	52.0	208	52.0	195	50.6	158	54.7	145	53.8	(ii)
LB	..	..	..	..	..	..	..	..	..	..	..	..	..	..
MA <i>i</i>	..	..	601	33.2	695	34.0	650	38.3	..	..	..	..	..	..	(ii)
MT <i>b</i>	10	21.7	5	14.9	5	18.5	6	19.1	6	14.9	..	..	..	..	(ii)
SY	..	..	..	..	235	37.5	..	..	..	..	..	..	..	..	(ii)
TN <i>b</i>	84	17.7	..	..	..	..	..	..	..	..	..	..	..	..	(ii)
TR	2 040	29.9	1 615	31.7	1 787	27.2	1 745	29.1	1 722	28.9	1 740	30.0	1 522	30.9	(ii)

Notes*a* The German part of the total before 1991 refers to the Federal Republic of Germany prior to 3.10.1990*b* Data (before the last break) are not from labour force surveys but are employment office statistics*c* No group totals because of an incomplete coverage for (one of) the countries*d* Gran Buenos Aires*e* Excluding rural population of Rondônia, Acre, Amazonas, Roraima, Pará and Amapá*f* Unemployed in urban areas, young people aged 16 to 25 years*g* Prior to 1995: including workers from the Judea, Samaria and Gaza areas*h* Excluding Transkei, Bophuthatswana, Venda, Ciskei; elsewhere persons enumerated at de facto dwelling place*i* Urban areas**Source: (i) Eurostat, Community Labour Force Survey****(ii) ILO****(iii) national source**

Table B.5.3: Educational Attainment 1995Persons aged 25-59 years by economic status, in %
Males & Females

	EU	B	DK	D a	EL	E	F	IRL b	I c	L	NL	A	P	S	FIN	UK
Total																
ISCED 0-2	41.5	42.7	18.4	17.2	54.1	69.0	38.1	51.8	62.0	56.1	20.4	29.2	77.3	23.7	30.5	46.8
ISCED 3	39.6	32.7	53.8	60.0	30.6	13.7	42.6	28.0	29.7	28.5	57.1	62.8	11.1	47.6	37.9	31.1
ISCED 5-7	18.9	24.6	27.8	22.8	15.3	17.3	19.3	20.1	8.3	15.5	22.5	8.0	11.7	28.7	31.6	22.1
Employed																
ISCED 0-2	34.6	33.2	15.1	13.0	49.9	61.2	32.6	41.2	53.9	49.7	14.7	24.9	73.1	22.5	26.3	41.4
ISCED 3	42.5	35.8	53.7	60.3	30.6	15.8	45.4	31.0	34.8	30.2	58.5	65.1	12.2	46.8	37.4	32.9
ISCED 5-7	22.9	31.0	31.1	26.7	19.5	23.1	22.1	27.8	11.2	20.1	26.9	10.0	14.7	30.7	36.3	25.7
Unemployed																
ISCED 0-2	49.0	55.9	22.1	24.3	48.9	68.0	46.7	86.3	61.1	..	26.6	37.2	91.8	32.0	37.9	55.7
ISCED 3	37.5	34.7	62.4	59.9	39.0	15.6	40.0	13.7	30.2	..	54.9	62.8	6.1	58.5	42.1	31.6
ISCED 5-7	13.5	9.4	15.5	15.8	12.2	16.4	13.3	..	8.7	..	18.5	..	2.2	9.5	20.0	12.7
Inactive																
ISCED 0-2	60.8	66.4	35.5	30.6	64.4	84.6	57.6	68.4	77.3	71.2	36.3	44.1	89.7	32.7	44.4	65.8
ISCED 3	31.4	23.3	51.4	59.0	29.2	8.9	31.8	24.4	20.0	24.2	53.6	54.3	8.0	50.0	37.3	23.6
ISCED 5-7	7.8	10.3	13.1	10.5	6.4	6.6	10.6	7.2	2.7	4.6	10.1	1.5	2.2	17.2	18.3	10.6

Females

	EU	B	DK	D a	EL	E	F	IRL b	I c	L	NL	A	P	S	FIN	UK
Total																
ISCED 0-2	45.2	44.6	21.5	22.3	55.9	70.9	41.5	47.3	63.6	63.7	23.8	37.9	76.6	20.9	29.1	53.3
ISCED 3	37.8	30.6	52.0	60.5	30.8	13.0	38.7	32.9	28.7	24.6	56.8	55.3	10.3	48.3	33.3	26.5
ISCED 5-7	17.0	24.8	26.5	17.1	13.3	16.1	19.7	19.8	7.7	11.7	19.5	6.8	13.1	30.8	37.6	20.2
Employed																
ISCED 0-2	34.4	29.5	16.4	16.3	46.9	54.6	34.1	28.6	47.2	56.0	15.7	32.4	69.8	19.1	25.5	46.9
ISCED 3	42.3	34.7	51.9	62.2	31.1	16.8	41.6	38.3	39.4	25.4	57.7	57.9	11.5	47.9	32.5	28.4
ISCED 5-7	23.3	35.8	31.7	21.5	22.0	28.6	24.3	33.1	13.3	18.6	26.6	9.7	18.7	33.0	42.0	24.7
Unemployed																
ISCED 0-2	46.6	54.1	28.4	24.3	45.4	63.0	46.5	71.5	54.6	..	26.1	47.3	85.0	26.0	35.8	58.1
ISCED 3	39.4	35.0	59.8	62.5	41.4	17.9	40.8	28.5	34.3	..	56.8	52.7	11.0	59.6	37.3	28.5
ISCED 5-7	14.0	10.9	11.8	13.1	13.2	19.1	12.7	..	11.1	..	17.1	..	3.9	14.5	26.9	13.5
Inactive																
ISCED 0-2	63.0	65.6	38.2	34.5	65.4	85.8	58.2	63.4	78.6	70.9	35.9	48.4	90.2	34.8	38.8	68.1
ISCED 3	29.8	23.6	50.1	56.6	29.4	8.6	31.0	28.1	18.9	23.8	55.3	50.1	7.6	47.1	34.3	21.7
ISCED 5-7	7.2	10.8	11.7	9.0	5.2	5.6	10.8	8.5	2.5	5.3	8.8	1.5	2.1	18.1	26.9	10.2

Notes

For details about ISCED, please refer to the Methodological Annex

a Very high rate of non-response

b ISCED 3 is underestimated

c Data not comparable with other countries

Source: Eurostat, Community Labour Force Survey

Table B.6.1: External Trade in Goods: Imports

Million ECU

	1980	1985	1990	1991	1992	1993	1994	1995	1996
European Union (EU)									
total EU	608 727	952 366	1 211 977	1 271 802	1 272 976	1 197 342	1 337 646	1 459 635	1 532 200
intra-EU	327 790	548 233	767 427	798 536	807 264	721 070	814 507	904 321	..
B+L	51 496	73 588	94 288	97 950	96 389	95 052	105 602	117 269	117 403
DK	13 879	23 579	24 796	25 961	25 944	26 077	29 791	32 983	33 952
D	134 645	207 526	268 945	313 854	314 656	292 535	320 750	354 848	349 987
EL	7 564	13 319	15 497	17 415	18 066	18 791	18 067	19 822	..
E	24 479	39 624	68 872	75 316	76 841	68 095	77 765	86 696	95 496
F	96 897	141 244	183 099	186 264	184 044	171 475	191 911	209 010	215 976
IRL	8 000	13 177	16 277	16 757	17 320	18 500	21 659	24 710	28 167
I	71 448	119 202	141 395	147 207	145 371	126 232	141 212	156 038	162 997
NL	55 223	85 458	98 930	101 606	103 590	98 777	109 718	120 740	126 715
A	17 548	27 296	39 278	40 932	41 688	41 470	46 481	50 200	..
P	6 677	10 028	19 954	21 322	23 581	20 704	22 753	25 661	26 873
FIN	11 235	17 342	21 287	17 583	16 313	15 400	19 637	13 786	24 339
S	24 018	37 411	42 850	40 180	38 418	36 424	43 525	47 130	50 393
UK	85 618	143 570	176 509	169 455	170 756	167 811	188 775	200 742	223 585
European Free Trade Association (EFTA)									
	39 012	61 842	77 145	75 687	72 027	73 611	81 348	87 621	91 053
IS	718	1 185	1 303	1 403	1 294	1 152	1 238	1 339	1 608
NO	12 182	20 388	21 115	20 607	20 087	20 513	22 946	25 004	27 020
CH	26 112	40 269	54 727	53 677	50 646	51 945	57 164	61 278	62 425
Central European Free Trade Association (CEFTA)									
	31 300	47 879	23 710	29 974	30 431	42 828	48 380	59 854	68 859
CZ	..	..	..	..	..	10 849	12 569	19 345	21 147
SK	..	..	..	..	..	5 431	5 558	6 498	6 089
CS	..	22 996	10 292	8 081	9 653	..	..	..	..
HU	6 633	10 683	6 810	9 177	8 535	10 701	12 235	11 824	12 493
PL	13 710	14 201	6 608	12 716	12 244	15 847	18 019	22 186	29 130
Other European Countries									
	..	..	129 556	59 165	55 989	64 665	80 787	94 271	98 400
BG	..	..	10 126	2 435	3 347	3 685	3 636	3 842	..
RO	..	..	7 157	4 675	4 822	5 569	5 976	7 858	9 006
RU ^a	..	..	..	..	28 491	28 015	42 559	46 572	48 185
UA ^a	..	..	..	..	1 709	2 264	9 055	8 699	..
SU ^b	..	..	94 761	35 071	..	..	..	..	..
TR	..	14 861	17 512	16 985	17 619	25 132	19 561	27 299	..
North American Free Trade Association (NAFTA)									
	239 300	591 974	521 107	536 778	568 417	682 968	770 520	770 332	845 300
CA	42 358	100 038	91 492	95 297	94 323	112 152	124 576	125 631	134 678
MX	..	18 340	23 213	30 764	47 704	55 740	66 694	55 392	..
US	181 708	473 596	406 402	410 717	426 390	515 076	579 250	589 309	643 928
South American Countries									
	36 800	37 094	31 537	39 334	45 708	56 261	64 125	76 110	86 700
AR	7 570	4 998	3 201	6 678	11 450	14 324	18 143	15 383	18 702
BR	..	18 781	17 638	18 542	17 215	23 314	29 853	41 083	44 875
CL	..	3 594	5 514	6 014	7 284	9 002	9 373	11 394	14 049
VE	..	9 721	5 183	8 100	9 759	9 621	6 756	8 250	..
Developed Asian Economies									
	148 332	271 376	329 948	361 055	353 720	415 718	475 332	534 607	588 500
JP	100 930	169 756	184 383	191 046	179 510	205 525	230 969	256 951	275 004
KR	15 975	40 802	54 844	65 786	62 983	71 558	86 037	103 297	118 397
SG	17 239	34 447	47 737	53 338	55 599	72 785	86 312	95 185	103 548
TW ^c	14 188	26 371	42 984	50 885	55 628	65 850	72 015	79 174	..

Table B.6.1: External Trade in Goods: Imports

Million ECU (continued)

	1980	1985	1990	1991	1992	1993	1994	1995	1996
Association of South-East Asian Nations (ASEAN-4)									
	28 260	49 208	76 564	91 106	94 923	118 471	141 439	165 857	179 400
ID	7 781	13 444	17 148	20 876	21 015	24 191	26 888	31 061	..
MY	7 731	16 515	22 967	29 521	30 651	38 762	49 672	58 903	..
PH	5 958	7 136	<i>10 243</i>	10 375	11 914	16 031	19 115	21 779	..
TH	6 790	12 113	26 206	30 334	31 343	39 487	45 764	54 113	..
China and Hong Kong									
	30 000	90 930	106 674	132 385	160 177	209 451	236 643	250 881	268 015
CN	..	52 150	41 898	51 479	62 079	88 778	97 194	100 981	109 491
HK	15 866	38 780	64 776	80 906	98 097	120 673	139 449	149 901	158 524
Other Asian Countries									
	13 600	28 980	24 465	22 590	26 050	28 218	31 569	36 923	38 859
PK	..	7 719	5 776	6 846	7 213	8 317	7 479	8 948	9 561
IN	9 925	21 261	18 689	15 744	18 837	19 901	24 089	27 975	29 298
Oceania									
	18 262	38 208	38 916	39 243	40 177	45 935	51 970	54 572	63 167
AU	14 300	30 347	31 469	32 386	33 086	37 690	41 965	43 901	51 571
NZ	3 962	7 861	7 447	6 857	7 091	8 245	10 005	10 671	11 596
Other Countries									
	19 100	24 397	25 908	28 038	28 646	32 914	37 887	42 875	47 051
IL	..	10 903	12 034	13 643	14 493	17 522	19 990	21 670	24 116
ZA	13 325	13 494	13 874	14 394	14 153	15 392	17 896	21 205	22 935
Mediterranean Countries									
	..	64 773	67 758	62 392	66 495	78 125	79 089	91 016	101 100
AL <i>d</i>	254	451	358	227	416	514	506	520	..
CY	863	1 634	2 013	2 115	2 543	2 166	2 534	2 824	3 136
DZ	7 573	12 898	<i>7 520</i>	<i>6 002</i>	6 662	7 502	8 069	7 516	9 267
EG	..	7 201	<i>13 182</i>	<i>6 706</i>	<i>6 413</i>	<i>7 015</i>	8 059	8 975	10 254
IL	..	10 903	12 034	13 643	14 493	17 522	19 990	21 670	24 116
LB	..	2 192	<i>1 982</i>	<i>3 021</i>	<i>3 237</i>	<i>1 892</i>	<i>2 406</i>	<i>4 079</i>	<i>5 964</i>
MA	3 004	5 045	<i>5 439</i>	<i>5 563</i>	<i>5 667</i>	5 686	6 048	6 529	6 500
MT	..	993	1 534	1 708	1 802	1 856	<i>1 859</i>	<i>2 034</i>	..
SY	2 962	5 199	<i>1 885</i>	<i>2 234</i>	<i>2 689</i>	<i>3 535</i>	<i>4 606</i>	<i>3 529</i>	<i>4 132</i>
TN	2 529	3 395	4 300	4 188	4 955	5 307	5 451	6 042	6 063
TR	..	14 861	17 512	16 985	17 619	25 132	19 561	27 299	..

Notes

a Prior to 1994, data exclude inter-trade among the Commonwealth of Independent States (CIS)

b For 1991, data for the former USSR are converted to US dollars using commercial exchange rate of rouble and are not comparable to those shown for prior periods

c The Central Bank of China: Financial Statistics, Taiwan District, The Republic of China

d IMF: International Financial Statistics

Source: UN COMTRADE database, but data in italics are from UN Monthly Bulletin of Statistics Online

Table B.6.2: External Trade in Goods: Exports

Million ECU

	1980	1985	1990	1991	1992	1993	1994	1995	1996
European Union (EU)									
total EU	540 213	925 334	1 159 895	1 199 939	1 217 017	1 232 522	1 386 330	1 528 572	1 617 900
intra-EU	329 483	551 859	766 280	797 521	805 047	763 481	861 723	951 933	..
B + L	46 329	70 257	92 896	95 684	95 108	103 213	115 399	128 557	127 793
DK	11 811	21 591	27 361	28 820	30 622	31 743	34 974	37 300	38 490
D	138 055	240 906	312 841	324 843	331 552	324 573	359 052	400 377	403 775
EL	3 693	5 945	6 324	6 978	7 579	7 501	7 902	8 375	..
E	14 967	31 879	43 687	48 569	49 542	52 065	61 527	68 513	79 508
F	79 903	127 985	164 906	172 192	178 677	176 153	196 136	217 159	228 015
IRL	6 089	13 630	18 689	19 564	21 828	24 643	28 915	33 478	35 885
I	55 782	103 470	132 362	136 704	137 433	143 904	159 732	176 869	197 543
NL	53 056	89 482	103 270	107 778	107 799	111 993	122 592	135 799	139 688
A	12 563	22 419	32 888	33 156	34 231	34 295	37 891	43 686	..
P	3 325	7 451	12 899	13 192	14 301	13 166	15 116	17 867	18 260
FIN	10 165	17 732	21 000	18 575	18 452	20 070	25 023	17 946	31 941
S	22 202	39 926	45 102	44 512	43 154	42 578	51 533	59 202	65 273
UK	82 274	132 661	145 669	149 371	146 738	146 627	170 538	183 445	204 162
European Free Trade Association (EFTA)									
	35 231	63 172	78 098	78 401	78 847	82 398	89 726	95 706	103 717
IS	669	1 066	1 246	1 268	1 176	1 195	1 367	1 378	1 494
NO	13 279	26 137	26 756	27 477	27 077	27 245	29 208	31 911	38 555
CH	21 284	35 968	50 096	49 656	50 593	53 958	59 150	62 416	63 668
Central European Free Trade Association (CEFTA)									
	33 700	49 167	27 571	29 036	27 367	35 076	40 913	50 467	51 587
CZ	..	..	..	..	..	11 010	11 838	16 579	17 277
SK	..	..	..	..	..	4 670	5 624	6 571	5 109
CS	..	22 899	9 331	8 779	8 979	..	..	..	..
HU	6 232	11 211	7 538	8 231	8 247	7 606	8 996	9 837	9 966
PL	12 208	15 056	10 703	12 027	10 141	11 790	14 455	17 479	19 236
Other European Countries									
	..	..	107 091	54 850	53 557	60 924	89 562	97 326	107 900
BG	..	..	10 483	3 095	3 308	3 059	3 502	3 892	..
RO	..	..	4 610	3 442	3 361	4 178	5 171	6 047	6 367
RU a	..	..	..	..	32 645	37 828	56 986	62 031	69 900
UA a	..	..	..	..	2 907	2 751	8 682	8 843	..
SU b	..	..	81 822	37 343	..	..	..	..	..
TR	..	10 429	10 177	10 970	11 336	13 108	15 221	16 513	..
North American Free Trade Association (NAFTA)									
	218 200	413 871	414 388	447 792	466 473	542 904	596 014	625 487	683 900
CA	46 637	114 638	99 652	102 314	103 584	123 511	139 766	146 911	158 751
MX	..	28 596	20 688	21 885	35 587	44 309	51 182	60 810	..
US	155 561	270 638	294 048	323 593	327 303	375 084	405 065	417 766	458 451
South American Countries									
	35 500	70 531	55 231	54 623	55 742	65 188	73 488	78 198	84 976
AR	5 760	11 003	9 702	9 664	9 425	11 202	13 315	16 026	18 734
BR	..	33 599	24 667	25 519	27 714	33 049	36 618	35 554	37 638
CL	..	4 932	6 692	7 231	7 637	7 949	9 557	12 157	12 099
VE	..	20 997	14 170	12 210	10 966	12 987	13 997	14 460	16 507
Developed Asian Economies									
	133 882	340 352	370 449	420 823	432 272	514 093	572 889	609 798	618 600
JP	93 230	230 512	225 334	253 821	261 652	308 208	332 571	338 635	323 644
KR	12 534	39 685	51 056	57 999	59 034	70 224	80 711	95 608	102 158
SG	13 916	29 939	41 408	47 584	48 889	63 200	81 398	90 415	98 565
TW c	14 203	40 216	52 651	61 418	62 697	72 461	78 209	85 140	..

Table B.6.2: External Trade in Goods: Exports

Million ECU

	1980	1985	1990	1991	1992	1993	1994	1995	1996
Association of South-East Asian Nations (ASEAN-4)									
	33 737	60 112	67 694	81 232	90 154	113 085	132 281	147 334	160 900
ID	15 735	24 357	20 162	23 518	26 167	31 446	33 672	34 723	..
MY	9 297	20 493	23 130	27 719	31 406	40 245	49 468	56 405	..
PH	4 130	6 013	6 337	7 133	7 568	9 714	11 183	13 130	..
TH	4 574	9 248	18 065	22 862	25 013	31 680	37 959	43 077	..
China and Hong Kong									
	32 700	72 980	113 296	137 583	157 558	193 961	229 072	246 673	261 578
CN	..	33 590	48 767	58 031	65 434	78 347	101 727	113 745	119 147
HK d	14 152	39 390	64 529	79 551	92 124	115 615	127 345	132 928	142 431
Other Asian Countries									
	7 200	15 328	18 361	19 640	21 526	24 806	28 289	29 637	33 323
PK	..	3 548	4 336	5 217	5 596	5 843	6 172	6 212	7 297
IN	5 394	11 779	14 024	14 424	15 930	18 964	22 117	23 425	26 026
Oceania									
	19 157	36 393	37 524	40 202	39 135	43 511	47 800	48 659	58 673
AU	15 375	29 093	30 397	32 677	31 863	34 812	37 905	38 520	47 674
NZ	3 782	7 300	7 127	7 525	7 272	8 698	9 895	10 139	10 999
Other Countries									
	22 400	20 200	27 398	27 584	28 260	33 096	35 112	35 464	38 252
IL	..	8 199	9 464	9 598	10 078	12 660	14 236	14 562	16 073
ZA	18 362	..	17 934	17 986	18 182	20 435	20 876	20 902	22 179
Mediterranean Countries									
	..	43 272	45 093	45 241	43 260	47 692	52 571	54 189	55 200
AL e	264	398	253	59	54	95	119	157	..
CY f	383	624	745	768	774	741	808	944	1 092
DZ	11 221	13 300	9 955	10 214	8 579	8 623	7 225	6 541	2 719
EG	..	2 409	3 893	3 059	2 360	1 923	2 919	2 633	2 784
IL	..	8 199	9 464	9 598	10 078	12 660	14 236	14 562	16 073
LB	..	274	388	435	431	386	483	560	799
MA	1 726	2 837	3 350	3 458	3 064	3 156	3 392	3 608	3 734
MT	..	524	812	928	1 089	1 065	1 326	1 451	..
SY	1 514	2 146	3 308	2 768	2 383	2 687	2 988	3 035	3 151
TN	1 604	2 132	2 747	2 986	3 112	3 249	3 854	4 185	4 345
TR	..	10 429	10 177	10 970	11 336	13 108	15 221	16 513	..

Notes

- a Prior to 1994, data exclude inter-trade among the Commonwealth of Independent States (CIS)
- b For 1991, data for the former USSR are converted to US dollars using commercial exchange rate of rouble and are not comparable to those shown for prior periods
- c The Central Bank of China: Financial Statistics, Taiwan District, The Republic of China
- d Data include between 70% and 80% re-exports
- e IMF: International Financial Statistics
- f Data from 1990 onwards include between 40% and 60% re-exports

Source: UN COMTRADE database, but data in italics are from UN Monthly Bulletin of Statistics Online

Table B.6.3: Total Imports and Exports between Country Groups

Million ECU

Imports 1985

Declaring Countries	Partner countries																
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World
EU 15		548 233	47 506	10 101	34 327	88 486	74 745	20 539	39 586	33 331	8 661	9 834	4 131	6 686	10 871	29 316	952 366
EFTA		46 336	643	501	1 152	4 496	3 916	644	3 442	2 900	250	718	154	232	338	665	61 842
CEFTA		9 350	1 279	5 340	20 274	698	550	672	372	342	148	662	261	235	10	518	47 879
Other Europe	
NAFTA		115 470	7 503	914	2 896	202 579	84 655	24 487	122 645	101 618	15 157	18 576	3 828	5 852	6 125	7 813	591 974
of which US		101 915	6 683	753	2 723	116 348	-	22 282	114 531	94 726	14 660	17 315	3 637	5 294	5 823	7 195	473 596
Other American		7 801	706	290	249	11 723	9 967	3 613	2 156	1 958	124	782	33	219	195	473	37 094
DAE a		21 937	3 881	251	2 275	57 522	47 681	4 832	24 106	15 750	30 719	13 752	2 738	13 644	2 790	1 954	245 005
of which JP		13 284	2 776	227	2 066	42 658	33 953	4 173	7 451	-	21 910	9 501	2 058	10 949	2 734	1 433	169 756
ASEAN-4		7 863	547	115	140	8 653	7 950	517	17 479	11 504	2 937	2 091	322	2 009	48	150	49 208
CN and HK		12 653	984	650	2 106	11 536	9 752	2 078	31 171	27 594	2 169	15 709	459	2 264	740	293	90 930
Other Asian		7 579	387	273	2 167	3 930	3 309	565	3 790	2 890	1 061	445	49	837	34	422	28 980
Oceania		9 495	470	59	56	8 702	7 814	324	10 109	8 618	1 034	1 167	224	2 591	239	104	38 208
IL and ZA		11 148	1 144	10	54	4 375	4 074	332	1 660	1 598	26	127	17	228	297	94	24 397
Med. Countries b		32 556	1 585	1 008	2 377	7 891	6 577	1 192	2 848	2 637	453	452	176	642	492	1 602	64 322

a Not including Taiwan

b Not including Albania

Imports 1990

Declaring Countries	Partner countries																
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World
EU 15		767 427	58 271	13 191	27 478	102 970	89 668	17 685	65 951	52 967	12 537	18 616	6 376	6 704	11 070	27 806	1 211 977
EFTA		57 488	797	436	828	5 946	5 267	487	4 012	3 399	417	1 087	248	177	902	654	77 145
CEFTA	
Other Europe	
NAFTA		96 619	7 942	900	2 433	173 872	74 666	18 885	106 270	81 131	15 300	22 576	3 444	5 619	4 357	6 766	521 107
of which US		81 107	6 052	717	2 152	97 735	-	17 085	96 793	73 719	14 440	20 583	3 202	4 787	4 136	6 479	406 402
Other American a		6 712	571	210	148	8 058	7 036	3 227	2 147	1 912	142	328	35	183	247	357	28 336
DAE b		43 203	5 046	422	3 235	72 197	62 412	6 006	38 314	24 214	30 305	15 924	2 769	14 489	2 746	2 389	286 964
of which JP		29 511	3 776	361	2 946	49 560	41 454	4 691	11 997	-	19 182	11 172	2 051	11 069	2 154	1 342	184 383
ASEAN-4 c		11 271	1 113	282	369	9 605	8 669	1 135	26 241	17 666	2 490	2 802	860	2 556	135	253	66 322
CN and HK	
Other Asian		5 483	398	293	924	3 129	2 737	328	3 054	2 089	834	444	72	777	65	367	24 465
Oceania		9 646	679	71	69	9 886	9 012	335	8 623	6 904	1 277	1 493	254	2 866	178	170	38 916
IL and ZA	
Med. Countries	

a Not including Argentina

b Not including Taiwan

c Not including Philippines

Table B.6.3: Total Imports and Exports between Country Groups

Million ECU (continued)

Imports 1995

Declaring Countries	Partner countries																
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World
EU 15		904 321	68 704	31 836	36 965	122 368	107 667	19 362	78 916	57 860	23 487	34 525	9 958	6 570	12 276	33 088	1 459 635
EFTA		67 565	766	767	1 136	6 595	5 709	574	3 746	2 954	750	1 773	366	219	567	736	87 621
CEFTA <i>a</i>		33 152	1 408	4 929	5 288	2 020	1 827	361	1 523	951	387	773	175	58	204	434	53 355
Other Europe	
NAFTA		122 320	10 841	1 592	5 949	290 586	125 228	20 347	143 803	107 007	37 200	49 129	6 149	4 957	6 796	8 875	770 332
<i>of which US</i>		104 598	8 698	1 385	5 434	161 332	-	18 298	130 720	97 243	34 521	45 298	5 634	3 942	6 333	8 271	589 309
Other American		19 952	1 438	236	458	22 768	19 378	12 384	6 112	3 764	771	1 965	259	535	590	546	76 110
DAE <i>b</i>		63 956	6 752	565	6 200	107 742	95 611	8 640	69 306	45 057	55 477	42 164	4 269	18 980	4 495	2 843	455 433
<i>of which JP</i>		37 364	4 038	268	3 963	67 411	58 027	6 119	18 460	-	29 347	29 629	2 690	13 074	2 954	1 639	256 951
ASEAN-4		26 341	2 581	354	2 218	25 649	23 852	2 210	65 468	44 592	8 770	7 679	1 606	5 467	666	630	165 857
CN and HK		32 257	3 061	273	4 149	27 592	24 118	2 049	70 078	44 130	11 437	59 887	2 388	4 048	2 283	1 100	250 881
Other Asian		9 736	1 081	231	1 193	4 214	3 764	513	4 555	2 841	2 117	1 347	97	963	344	679	36 923
Oceania		13 166	778	81	80	12 485	11 366	436	11 130	8 149	2 702	3 226	463	4 333	433	276	54 572
IL and ZA		20 659	1 875	138	599	6 947	6 529	538	3 871	2 803	568	1 114	315	431	433	594	42 875
Med. Countries	

a Not including Slovakia*b* Not including Taiwan**Exports 1985**

Declaring Countries	Partner countries																
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World
EU 15		551 859	47 042	8 870	26 500	106 258	92 245	7 823	18 719	11 523	6 673	12 598	7 743	9 568	10 140	34 928	925 334
EFTA		42 894	645	604	1 070	6 107	5 383	668	2 181	1 529	447	1 119	404	463	1 031	1 663	63 172
CEFTA		9 709	711	5 032	19 949	840	663	333	178	158	86	778	294	51	9	1 676	49 167
Other Europe	
NAFTA		75 611	3 946	599	6 937	185 779	108 566	11 635	48 251	35 457	6 362	9 861	3 814	8 398	4 260	8 896	413 871
<i>of which US</i>		64 747	3 444	508	5 101	75 858	-	9 849	40 105	28 311	5 630	8 401	3 199	7 555	3 984	7 801	270 638
Other American		18 357	518	672	2 718	23 440	21 037	3 397	4 229	3 780	401	1 831	606	293	302	1 384	70 531
DAE <i>a</i>		38 197	3 374	313	4 982	116 228	107 115	2 076	24 189	8 771	17 120	29 317	4 821	10 320	1 598	3 589	300 136
<i>of which JP</i>		30 256	2 393	280	4 452	93 867	86 635	1 784	14 406	-	9 593	24 922	3 124	8 457	1 564	2 920	230 512
ASEAN-4		7 393	211	134	623	12 382	11 942	121	28 027	18 517	2 706	2 125	1 009	976	29	404	60 112
CN and HK		7 251	555	649	1 711	13 613	12 541	613	11 179	8 214	1 347	11 344	403	902	99	396	55 343
Other Asian		3 064	173	228	2 469	2 668	2 486	42	1 996	1 661	219	441	65	192	27	203	15 276
Oceania		5 266	63	207	1 039	3 846	3 359	156	10 836	8 763	1 321	2 045	566	2 171	127	752	36 393
IL and ZA		2 710	208	11	65	2 903	2 804	83	362	275	23	249	22	83	84	162	8 199
Med. Ctrs. <i>b</i>		23 124	548	310	2 586	5 608	5 094	317	846	672	116	332	288	100	404	2 003	42 875

Data do not include re-exports, which are especially important for Hong Kong

a Not including Taiwan*b* Not including Albania

Table B.6.3: Total Imports and Exports between Country Groups

Million ECU (continued)

Exports 1990

Declaring Countries	Partner countries																
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World
EU 15		766 280	58 537	12 054	24 725	96 019	81 475	8 318	36 422	24 139	10 645	12 585	7 766	9 010	11 292	33 766	159 895
EFTA		54 170	637	741	1 405	7 210	5 858	660	4 034	2 906	827	1 681	422	592	1 072	1 870	78 098
CEFTA	
Other Europe	
NAFTA		88 255	5 590	544	5 448	172 852	89 297	9 394	61 333	42 884	8 995	10 175	3 080	8 134	4 026	8 252	414 388
of which US		77 111	4 334	496	4 527	82 974	-	8 318	53 243	36 225	8 119	8 520	2 780	7 386	3 646	7 379	294 048
Other American a		12 526	295	285	382	15 914	14 502	2 020	4 283	3 328	749	603	215	226	217	520	45 529
DAE b		60 000	3 715	530	3 551	104 750	95 469	2 152	37 986	13 535	28 662	22 437	3 731	8 395	1 825	3 620	317 798
of which JP		45 908	3 001	393	2 898	78 442	71 376	1 729	22 117	-	17 418	15 079	2 131	6 366	1 592	2 464	225 334
ASEAN-4 c		10 065	345	191	372	11 342	10 674	92	25 874	15 346	2 561	3 374	753	1 138	52	492	61 357
CN and HK	
Other Asian		4 512	250	207	2 528	2 823	2 610	27	2 286	1 672	548	747	70	215	49	291	18 361
Oceania		5 297	673	76	585	5 089	4 321	258	12 944	9 329	2 390	1 717	557	2 642	110	501	37 524
IL and ZA	
Med. Countries	

Data do not include re-exports, which are especially important for Hong Kong

a Not including Argentina

b Not including Taiwan

c Not including Philippines

Exports 1995

Declaring Countries	Partner countries																
		EU 15	EFTA	CEFTA	Other European Countries	NAFTA	of which USA	Other American Countries	DAE	Of which JAPAN	ASEAN-4	China and Hong Kong	Other Asian Countries	Oceania	Israel and South Africa	Mediterranean Countries	World
EU 15		951 933	68 905	38 469	36 487	116 424	101 796	19 955	54 728	31 996	24 117	29 918	11 243	12 023	18 420	49 007	528 572
EFTA		64 418	709	1 358	1 360	9 527	7 543	1 137	5 203	3 217	1 623	2 664	676	776	1 217	2 108	95 706
CEFTA		28 403	693	4 815	3 643	1 235	1 101	203	417	197	233	222	190	64	127	834	43 894
Other Europe	
NAFTA		100 688	6 634	1 290	4 899	290 609	167 557	20 352	85 183	54 035	18 616	24 867	3 449	9 925	6 132	10 915	625 487
of which US		88 932	5 403	1 118	4 559	120 900	-	17 323	75 756	46 605	17 384	18 591	3 116	9 096	5 793	9 972	417 766
Other American		17 859	679	197	1 115	18 490	17 115	12 776	6 955	5 116	1 787	1 956	564	365	626	1 426	78 198
DAE		78 483	3 650	1 201	4 354	138 259	128 407	5 908	69 147	20 087	72 522	63 023	5 688	11 064	3 974	5 373	524 657
of which JP		53 911	2 511	515	1 654	100 473	93 290	3 414	41 466	-	40 973	38 009	2 882	7 433	2 662	2 895	338 635
ASEAN-4		22 008	617	752	919	30 710	28 969	933	51 677	25 812	8 269	11 361	1 961	2 599	605	1 314	147 334
CN and HK		18 594	710	756	1 838	26 762	24 979	1 270	32 172	22 937	5 172	33 791	1 249	1 715	712	1 343	136 639
Other Asian		8 534	307	123	1 131	5 533	5 145	209	3 412	2 110	1 464	2 206	89	421	431	696	30 409
Oceania		5 050	269	32	413	3 237	2 753	416	15 552	9 834	4 111	3 399	757	4 204	331	414	48 659
IL and ZA		10 619	1 200	160	667	6 039	5 770	590	3 184	2 215	757	1 391	447	508	400	610	35 464
Med. Countries	

Data do not include re-exports, which are especially important for Hong Kong

a Not including Slovakia

b Not including Taiwan

Source: UN COMTRADE database

Table B.7.1: Total Inward Flows of Direct Investment

Without reinvested earnings

Million ECU

	1985	1990	1991	1992	1993	1994	Source
European Union (EU)							
B + L	1 317	6 269	7 520	8 742	9 200	7 014	(i)
DK	152	950	1 180	785	1 424	4 130	(i)
D	837	3 082	2 138	1 843	3 070	5 780	(i)
EL <i>a</i>	241	308	332	457	345	453	(i)
E	2 503	10 199	8 273	6 365	6 127	8 244	(i)
F <i>b</i>	2 930	7 120	8 957	12 307	10 450	9 262	(i)
IRL	611	3 197	5 458	2 180	2 655	1 578	(i)
I	1 412	4 995	2 008	2 442	3 202	1 883	(i)
NL <i>a</i>	849	6 995	4 250	5 254	6 259	3 848	(i)
A	222	515	288	727	838	1 109	(i)
P	340	1 968	1 930	1 486	1 297	1 057	(i)
FIN	19	255	- 5	436	719	1 099	(i)
S	364	1 608	5 108	700	2 287	4 136	(i)
UK <i>c</i>	212	21 262	11 219	11 768	7 476	3 258	(i)
European Free Trade Association (EFTA)							
IS <i>d</i>	31	17	15	- 9	0	0	(ii)
NO <i>d</i>	..	926	- 40	626	1 247	1 041	(ii)
CH <i>d</i>	1 391	3 512	2 114	317	- 71	2 779	(ii)
Other European Countries							
TR <i>d</i>	307	1 461	1 587	1 402	1 762	1 243	(ii)
North American Free Trade Association (NAFTA)							
CA	1 701	6 169	2 217	3 437	4 253	6 121	(ii)
MX <i>d</i>	4 359	2 810	3 454	3 143	5 984	10 409	(ii)
US	26 733	49 149	35 424	23 872	43 061	35 186	(i)
Developed Asian Economies							
JP <i>a</i>	1 219	2 182	3 502	3 146	2 629	3 493	(ii)
Oceania							
AU <i>d</i>	2 373	4 594	4 569	3 241	3 188	3 700	(ii)
NZ <i>de</i>	298	1324	1369	840	2031	2352	(ii)

Notes

(-) sign means disinvestment

a No minimum threshold to be qualified as direct investor*b* From January 1993 onwards, the minimum threshold has been lowered from 20% to 10% of the shares in the company*c* The minimum threshold for a holding in a client investment enterprise is 20 %*d* Including reinvested earnings*e* Minimum qualifying threshold is fixed at the acquisition of 25% or more of any class of share or voting power in a company

Source: (i) Eurostat

(ii) OECD

Table B.7.2: Total Outward Flows of Direct Investment

Without reinvested earnings

Million ECU

	1985	1990	1991	1992	1993	1994	Source
European Union (EU)							
B + L	178	4 849	4 852	8 742	3 542	1 017	(i)
DK	370	1 274	1 658	1 729	1 076	3 335	(i)
D	5 422	16 434	16 239	14 377	13 863	14 052	(i)
EL <i>a</i>	196	21	- 9	52	- 14	- 167	(i)
E	313	2 228	2 879	961	2 107	3 562	(i)
F <i>b</i>	2 938	21 204	16 583	14 521	10 393	9 177	(i)
IRL	145	570	1 558	689	3 021	1 118	(i)
I	1 903	5 843	5 495	4 375	6 174	4 302	(i)
NL <i>a</i>	3 743	10 332	9 810	10 780	9 818	12 137	(i)
A	65	1 279	1 042	1 446	1 253	1 013	(i)
P	19	130	383	529	83	239	(i)
FIN	104	839	217	1 304	2 160	3 422	(i)
S	1 686	10 017	5 065	733	1 323	2 860	(i)
UK <i>c</i>	6 082	2 639	4 760	6 869	9 124	6 984	(i)
European Free Trade Association (EFTA)							
IS <i>d</i>	0	8	22	2	10	19	(ii)
NO <i>d</i>	..	1 127	1 475	305	797	1 907	(ii)
CH <i>d</i>	6 055	5 021	5 292	4 387	7 484	9 290	(ii)
Other European Countries							
TR <i>d</i>	..	149	27	72	141	171	(ii)
North American Free Trade Association (NAFTA)							
CA	5 061	3 718	4 563	2 843	4 958	6 252	(ii)
MX	..	..	..	..	..	..
US	- 1 232	6 873	12 851	20 301	35 106	12 317	(i)
Developed Asian Economies							
JP <i>a</i>	16 010	44 694	33 560	26 298	30 764	34 511	(ii)
Oceania							
AU <i>d</i>	1 596	1 445	- 589	787	1 650	3 890	(ii)
NZ <i>de</i>	228	1858	1189	302	-1243	1718	(ii)

Notes

(-) sign means disinvestment

a No minimum threshold to be qualified as direct investor*b* From January 1993 onwards, the minimum threshold has been lowered from 20% to 10% of the shares in the company*c* The minimum threshold for a holding in a client investment enterprise is 20 %*d* Including reinvested earnings*e* Minimum qualifying threshold is fixed at the acquisition of 25% or more of any class of share or voting power in a company

Source: (i) Eurostat

(ii) OECD

Table B.7.3: Geographical Breakdown of total EU Flows of International Direct Investment in 1994

Million ECU

	OUTWARD FLOWS			INWARD FLOWS		
	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"
European Union (EU)	42 322	..	..	32 544	..	..
B +L	3 634	..	..	3 485	..	..
DK	1 271	..	..	1 138	..	..
D	7 054	..	..	5 783	..	..
EL	305	..	..	- 92	..	..
E	4 397	..	..	97	..	..
F	5 647	..	..	3 644	..	..
IRL	902	..	..	1 171	..	..
I	2 046	..	..	1 570	..	..
NL	4 497	..	..	9 766	..	..
A	- 205	..	..	422	..	..
P	803	..	..	148	..	..
FIN	574	..	..	516	..	..
S	5 593	..	..	- 426	..	..
UK	5 579	..	..	5 504	..	..
European Free Trade Association (EFTA) a	961	..	..	5 693	..	..
IS	12	..	..	1	..	..
NO	1 018	..	..	623	..	..
CH	- 105	..	..	5 034	..	..
Central European Free Trade Association (CEFTA)	2 529	..	..	- 111	..	..
CZ	961	..	..	21	..	..
SK	107	..	..	1	..	..
HU	842	..	..	- 147	..	..
PL	619	..	..	14	..	..
Other European Countries	956	..	..	67	..	..
BG	94	..	..	3	..	..
RO	59	..	..	3	..	..
RU	352	..	..	56	..	..
UA	52	..	..	1	..	..
TR	399	..	..	4	..	..
North American Free Trade Association (NAFTA)	7 033	..	..	8 823	..	..
CA	241	..	..	- 368	..	..
MX	360	..	..	643	..	..
US	6 432	..	..	8 547	..	..
South American Countries	913	..	..	93	..	..
AR	502	..	..	- 2	..	..
BR	310	..	..	72	..	..
CL	53	..	..	2	..	..
VE	48	..	..	21	..	..
Developed Asian Economies	996	..	..	1 544	..	..
JP	300	..	..	1 422	..	..
KR	273	..	..	142	..	..
SG	360	..	..	- 35	..	..
TW	63	..	..	15	..	..

Table B.7.3: Geographical Breakdown of total EU Flows of International Direct Investment in 1994

Million ECU (continued)

	OUTWARD FLOWS			INWARD FLOWS		
	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"
Association of South-East Asian Nations (ASEAN-4)	1 602	..	..	103	..	..
ID	367	..	..	5	..	..
MY	437	..	..	32	..	..
PH	529	..	..	4	..	..
TH	269	..	..	62	..	..
China and Hong Kong	170	..	..	112	..	..
CN	507	..	..	12	..	..
HK	- 337	..	..	100	..	..
Other Asian Countries	..	..	..	..	..	..
PK	..	..	..	..	..	..
IN	225	..	..	- 6	..	..
Oceania	935	..	..	435	..	..
AU	833	..	..	246	..	..
NZ	102	..	..	189	..	..
Other Countries	106	..	..	183	..	..
IL	36	..	..	125	..	..
ZA	70	..	..	58	..	..
Mediterranean Countries	..	..	..	..	..	..
<i>Maghreb</i> ^b	223	..	..	40	..	..
AL	1	..	..	0	..	..
CY	..	..	..	..	..	..
EG	60	..	..	18	..	..
IL	36	..	..	125	..	..
LB	..	..	..	..	..	..
MT	..	..	..	..	..	..
SY	..	..	..	..	..	..
TR	399	..	..	4	..	..
Extra EU 15	21 530	..	..	19 964	..	..
World	63 852	..	..	52 508	..	..

Notes

(-) sign means disinvestment

^a Liechtenstein included^b Algeria, Morocco, Tunisia

Source: Eurostat

Table B.7.4: Geographical Breakdown of total USA Flows of International Direct Investment in 1994

Million ECU

	OUTWARD FLOWS			INWARD FLOWS		
	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"
European Union (EU)	3 774	7 135	10 909	16 164	5 760	21 924
B +L	568	1 020	1 588	794	- 236	557
DK	80	97	177	518	3	521
D	897	656	1 553	4 461	799	5 259
EL	- 9	29	20	..	..	8
E	1 045	- 409	636	398	166	564
F	2 097	629	2 725	3 566	100	3 666
IRL	111	1 264	1 375	- 374	77	- 297
I	932	974	1 906	275	- 40	235
NL	1 100	974	2 073	- 1 907	1 342	- 565
A	118	54	171	235	- 26	208
P	31	112	143	..	..	1
FIN	39	40	78	281	- 1	280
S	112	98	209	1 134	- 39	1 095
UK	- 3 344	1 600	- 1 744	6 779	3 607	10 387
European Free Trade Association (EFTA) a	..	..	1 081	..	..	4 525
IS	..	..	3	..	..	6
NO	- 115	375	260	504	40	543
CH	- 655	1 473	818	3 037	939	3 976
Central European Free Trade Association (CEFTA)	..	..	..	..	..	..
CZ	..	..	70	..	..	..
SK	..	..	..	..	..	..
HU	..	..	109	..	..	- 2
PL	..	..	82	..	..	2
Other European Countries	..	..	..	..	..	..
BG	..	..	8	..	..	0
RO	..	..	24	..	..	..
RU	..	..	79	..	..	41
UA	..	..	..	..	..	..
TR	34	110	145	..	..	- 3
North American Free Trade Association (NAFTA)	2 611	3 730	6 341	2 726	1 487	4 213
CA	870	2 704	3 574	1 777	1 558	3 335
MX	1 741	1 026	2 768	949	- 71	879
US	..	..	..	..	..	..
South American Countries	1 725	3 953	5 678	..	..	123
AR	578	490	1 068	..	..	30
BR	186	2 760	2 946	- 57	78	21
CL	636	450	1 086	..	..	- 8
VE	325	253	578	56	24	80
Developed Asian Economies	1 979	2 920	4 900	7 737	- 1 122	6 615
JP	1 120	1 271	2 391	6 595	- 1 179	5 416
KR	110	225	335	171	64	235
SG	467	1 064	1 532	769	- 50	719
TW	282	360	642	202	43	245

Table B.7.4: Geographical Breakdown of total USA Flows of International Direct Investment in 1994

Million ECU (continued)

	OUTWARD FLOWS			INWARD FLOWS		
	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"
Association of South-East Asian Nations (ASEAN-4)						
	651	821	1 471	..	..	132
ID	161	32	193	..	..	12
MY	166	145	311	136	6	142
PH	118	192	309	29	- 7	23
TH	206	452	658	..	..	- 45
China and Hong Kong						
	1 199	583	1 783	..	..	300
CN	626	14	641	..	..	149
HK	573	569	1 142	74	77	151
Other Asian Countries						

PK	..	..	..	..	..	..
IN	62	90	152	..	..	3
Oceania						
	20	1 421	1 441	1 797	- 226	1 571
AU	- 45	1 206	1 161	1 755	- 217	1 538
NZ	65	215	280	42	- 9	33
Other Countries						
	- 18	265	247	230	- 7	224
IL	- 38	150	112	238	- 5	233
ZA	20	115	135	- 8	- 2	- 9
Mediterranean Countries						

<i>Maghreb b</i>	..	..	..	..	..	7
AL	..	..	14	..	..	..
CY	..	..	..	..	..	..
EG	- 152	67	- 85	..	..	2
IL	- 38	150	112	238	- 5	233
LB	..	..	..	..	..	..
MT	..	..	..	..	..	..
SY	..	..	..	..	..	..
TR	34	110	145	..	..	- 3
Extra EU 15						
	8 543	20 646	29 189	19 022	1 143	20 165
World						
	12 317	27 781	40 098	35 186	6 904	42 089

Notes

(-) sign means disinvestment

a Liechtenstein included

b Algeria, Morocco, Tunisia

Source: Eurostat

Table B.7.5: Geographical Breakdown of total Japan Flows of International Direct Investment in 1994
Million ECU

	OUTWARD FLOWS			INWARD FLOWS		
	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"
European Union (EU)						
	..	..	..	1 137	..	..
B + L	733	..	..	13	..	..
DK	..	..	..	3	..	..
D	611	..	..	422	..	..
EL	..	..	..	-	..	..
E	155	..	..	-	..	..
F	351	..	..	55	..	..
IRL	288	..	..	49	..	..
I	145	..	..	7	..	..
NL	883	..	..	440	..	..
A	35	..	..	1	..	..
P	2	..	..	-	..	..
FIN	3	..	..	5	..	..
S	36	..	..	40	..	..
UK	1 823	..	..	103	..	..
European Free Trade Association (EFTA) a						
	..	..	..	130	..	..
IS	..	..	..	-	..	..
NO	17	..	..	1	..	..
CH	33	..	..	129	..	..
Central European Free Trade Association (CEFTA)						

CZ	..	..	..	..	..	..
SK	..	..	..	..	..	..
HU	34	..	..	-	..	..
PL	3	..	..	-	..	..
Other European Countries						

BG	..	..	..	-	..	..
RO	..	..	..	-	..	..
SU	16	..	..	-	..	..
UA	..	..	..	..	..	..
TR	63	..	..	-	..	..
North American Free Trade Association (NAFTA)						
	15 499	..	..	1 610	..	..
CA	414	..	..	268	..	..
MX	515	..	..	-	..	..
US	14 570	..	..	1 342	..	..
South American Countries						

AR	18	..	..	-	..	..
BR	1 038	..	..	-	..	..
CL	12	..	..	-	..	..
VE	..	..	..	..	..	..
Developed Asian Economies						
	1 456	..	..	386	..	..
JP	..	..	..	261	..	..
KR	336	..	..	55	..	..
SG	886	..	..	49	..	..
TW	234	..	..	21	..	..

Table B.7.5: Geographical Breakdown of total Japan Flows of International Direct Investment in 1994
 Million ECU (continued)

	OUTWARD FLOWS			INWARD FLOWS		
	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"	"Equity Capital + Other Capital"	"Reinvested Earnings"	"Total Capital"
Association of South-East Asian Nations (ASEAN-4)	3 269	..	..	-	..	..
ID	1 479	..	..	-	..	..
MY	624	..	..	-	..	..
PH	562	..	..	-	..	..
TH	604	..	..	-	..	..
China and Hong Kong	3 109	..	..	71	..	..
CN	2 156	..	..	6	..	..
HK	952	..	..	65	..	..
Other Asian Countries	..	..	..	..	..	..
PK	..	..	..	..	..	..
IN	81	..	..	1	..	..
Oceania	1 160	..	..	26	..	..
AU	1 063	..	..	25	..	..
NZ	97	..	..	1	..	..
Other Countries	..	..	..	..	..	..
IL	..	..	..	..	..	..
ZA	..	..	..	..	..	..
Mediterranean Countries	..	..	..	..	..	..
<i>Maghreb a</i>	..	..	..	..	..	..
AL	..	..	..	..	..	..
CY	..	..	..	..	..	..
EG	..	..	..	..	..	..
IL	..	..	..	..	..	..
LB	..	..	..	..	..	..
MT	..	..	..	..	..	..
SY	..	..	..	..	..	..
TR	63	..	..	-	..	..
Extra EU 15	..	..	..	..	..	..
World	34 511	..	..	3 493	..	..

Notes

(-) sign means disinvestment

a Algeria, Morocco, Tunisia

Source: OECD

METHODOLOGICAL ANNEX

In this annex methodological details are provided concerning the indicators used in the Report. First of all, general definitions are given (see also the glossary), as well as details on some of the classifications used throughout the Report and on some of the datasets used in the main report but not in the statistical annex. The second and third part of this annex contain methodological notes on the statistics and indicators included in parts A and B of the statistical annex. These two parts follow closely the structure of the Statistical Annex. Finally, a short section is devoted to the estimation of missing values and nowcasting.

Definitions and Classifications

Research and (Experimental) Development

Definitions

According to the OECD manual on the *Proposed Standard Practice for Surveys of Research and Development* - *Frascati Manual (FM), 1994* “research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications” (FM, p 29).

The term R&D covers three activities:

- *basic research* as experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view;
- *applied research* as also original investigation undertaken in order to acquire new knowledge, however, directed primarily towards a specific practical aim or objective;
- *experimental development* in the sense of systematic work, drawing on existing knowledge gained from research and/or practical experience, that is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.

“The basic criterion for distinguishing R&D from related activities is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty, i.e. when the solution to a problem is not readily apparent to someone familiar with the basic stock of commonly used knowledge and techniques in the area concerned”, (FM, p.33).

Thus, a number of activities can readily be excluded from R&D (FM, pp 29-33):

- education and training
- patent and license work
- specialised medical care
- policy related studies
- routine software development.

The Frascati definitions are generally applied by the agencies collecting R&D data in OECD member states. The OECD secretariat brings these data together, ensuring the international standards of the Frascati Manual have been adhered to.

For non-OECD member states, the Frascati definition is not always used. In general, in the Report the data used from national sources comply with Frascati Manual standards, but this cannot always be verified from the publications by national statistical offices. The data coming from *national sources* are therefore in general less reliable (in terms of definitions used) than the data coming from OECD and Eurostat.

One special case is the data published by UNESCO using the concepts outlined in the *Manual for statistics on scientific and technological activities* (UNESCO, 1984). UNESCO uses the concept of “Scientific and technological services” (STS). STS are a broader concept than just R&D, and includes, among other things, S&T activities by museums and libraries, translation of scientific literature, surveying (e.g., geological) and quality control. The data coming from UNESCO used in this report often are based on this broader definition, and thus overstate R&D expenditures. Because no data exist which enable the non-R&D activities to be filtered out from STS, no attempt has been made to correct for this over-estimation. Given the importance of *Frascati-consistent* countries relative to the countries for which data from UNESCO were used, this is however unlikely to have a large impact on the estimation of total world-wide expenditures on R&D.

Another special case are the data on the Framework Programmes for Research and Technological Development and Demonstration (FPRTD) of the European Community. The statistics presented on the FPRTDs cover more than just R&D as defined in the Frascati Manual.

Institutional Classifications

In order to facilitate the collection and the analysis and interpretation of R&D data, the statistical units can be classified into five institutional sectors. The following definitions are based largely on the System of National Accounts (SNA), with the difference that higher education has been established as a separate sector and households have, by convention, been merged with the private non-profit sector. As in the SNA, non-profit institutions (NPIs) have been distributed between sectors.

The *Business Enterprise sector* includes:

- all firms, organisations and institutions whose primary activity is the market production of goods or services (other than higher education) for sale to the general public at an economically significant price;
- the private non-profit institutes mainly serving them.

The *Government sector* is composed of:

- all departments, offices and other bodies which furnish but normally do not sell to the community those common services, other than higher education, which cannot otherwise be conveniently and economically provided and administer the state and the economic and social policy of the community. (Public enterprises are included in the business enterprise sector);
- NPIs controlled and mainly financed by government.

The *Higher Education sector* is composed of:

- all universities, colleges of technology, and other institutes of post-secondary education, whatever their source of finance or legal status. It also includes all research institutes, experimental stations and clinics operating *under the direct control of or administered by* or *associated with* higher education establishments.

The *Private Non-Profit sector* covers:

- non-market, private non-profit institutions serving households (i.e. the general public);
- private individuals or households.

According to this classification R&D expenditure *performed* in the different institutional sectors can be distinguished as Business Enterprise R&D expenditure (BERD), Government R&D expenditure (GOVERD), Higher Education R&D expenditure (HERD) and Private Non-Profit R&D expenditure (PNPERD). When analysing Gross Domestic Expenditure (GERD) by *source of funds*, a fifth sector is of relevance:

The sector *Abroad* consists of:

- all institutions and individuals located outside the political frontiers of a country except for vehicles, ships, aircraft and space satellites operated by domestic organisations and testing grounds acquired by such organisations;
- all international organisations (except business enterprises), including facilities and operations within the frontiers of a country.

According to the recommendations of the Frascati Manual, the R&D expenditure performed in the Higher Education sector (HERD) that are financed from Government funds are distinguished between *direct government* and *general university funds*. General university funds (GUF) are that part of university research which is financed from the general grant from ministries of education, which is destined for both education and research. Such flows may represent up to 90% of all university research and an important share of all public support for R&D. The other institutional sectors are supported by *direct government funds* (only).

The UNESCO S&T Manual distinguishes the following institutional sectors (of performance), which differ in some respects from those defined in the Frascati Manual:

The *Productive sector* covers:

- domestic and foreign industrial and trading establishments situated within the country which produce and distribute goods and services for sale, and institutions *directly* serving them with or without contract, whatever their form of ownership (public and private). The S&T activities of these enterprises and institutions closely linked to production are known as *S&T activities integrated with production*;
- governmental, non-governmental and non-profit institutions most or all of whose S&T activities *indirectly* serve one or more of the categories or classes of activities with a two or three-digit classification in the International Standard Industrial Classification of all Economic Activities (ISIC). The S&T activities of these institutions which are only indirectly linked to production are known as *R&D activities not integrated with production*. In countries with a centralised economy, R&D institutes at-

tached to the ministries responsible for the different branches of the national economy should be classified in this category of institutions (UNESCO S&T Manual, chapter V.2.1).

The *Higher Education sector* comprises:

- establishments of education at the third level which require as a minimum condition of admission successful completion of education at the second level or evidence of the attainment of an equivalent level of knowledge, together with research institutes, experimental stations, hospitals and other S&T institutions serving such establishments and directly administered by or associated with them (UNESCO S&T Manual, chapter V.2.2).

The *General Service sector* includes:

- bodies, departments and establishments subordinate to the central, state (in federal systems), provincial, district or county, municipal, town or village authorities that serve the community as a whole and provide a wide range of services such as administration, maintenance and regulation of public order, public health, culture, social services, promotion of economic growth, welfare and technical progress, etc.;
- institutions such as national scientific research and technology councils, academies of science, professional scientific organisations and other institutions which serve the whole of the community;
- institutions whose S&T activities (including R&D) are carried out for the general benefit of agriculture, industry, transport and combinations, building and public works or the public electricity, gas and water services - i.e. activities classified under a single-digit reference in the ISIC.

The UNESCO S&T Manual does not distinguish a separate PNP sector.

As illustrated in the boxes below an unambiguous correspondence between the two classifications cannot be easily established. However taking into consideration the incompatibilities between the two systems, for practical reasons in the tables referring to R&D expenditure, R&D personnel by sector of performance and data on the *Business Enterprise sector* (Frascati Manual) have been combined with data for the *Productive sector* (UNESCO S&T Manual). Accordingly, data referring to the *Government sector* (Frascati Manual) have been included with the *General Service sector* (UNESCO S&T Manual). When consulting these tables, the differences described above should always be kept in mind.

Unlike the Frascati Manual, where data on performance and funding of R&D activities are broken down according to the same institutional sectors, the UNESCO S&T Manual follows a slightly different classification for the identification of the sources of funding of such activities.

Productive enterprise funds and special funds should include funds allocated to R&D activities by institutions classified in the Productive sector as productive establishments or enterprises and all sums received from the “Technical and Economic Progress Fund” in countries with a centralised economy and other similar funds (UNESCO S&T Manual, chapter IV.4.1.2). This group of funds corresponds to the Business Enterprise sector as a funding sector in the Frascati Manual (cf. UNESCO S&T Manual, Appendix IV.1.2).

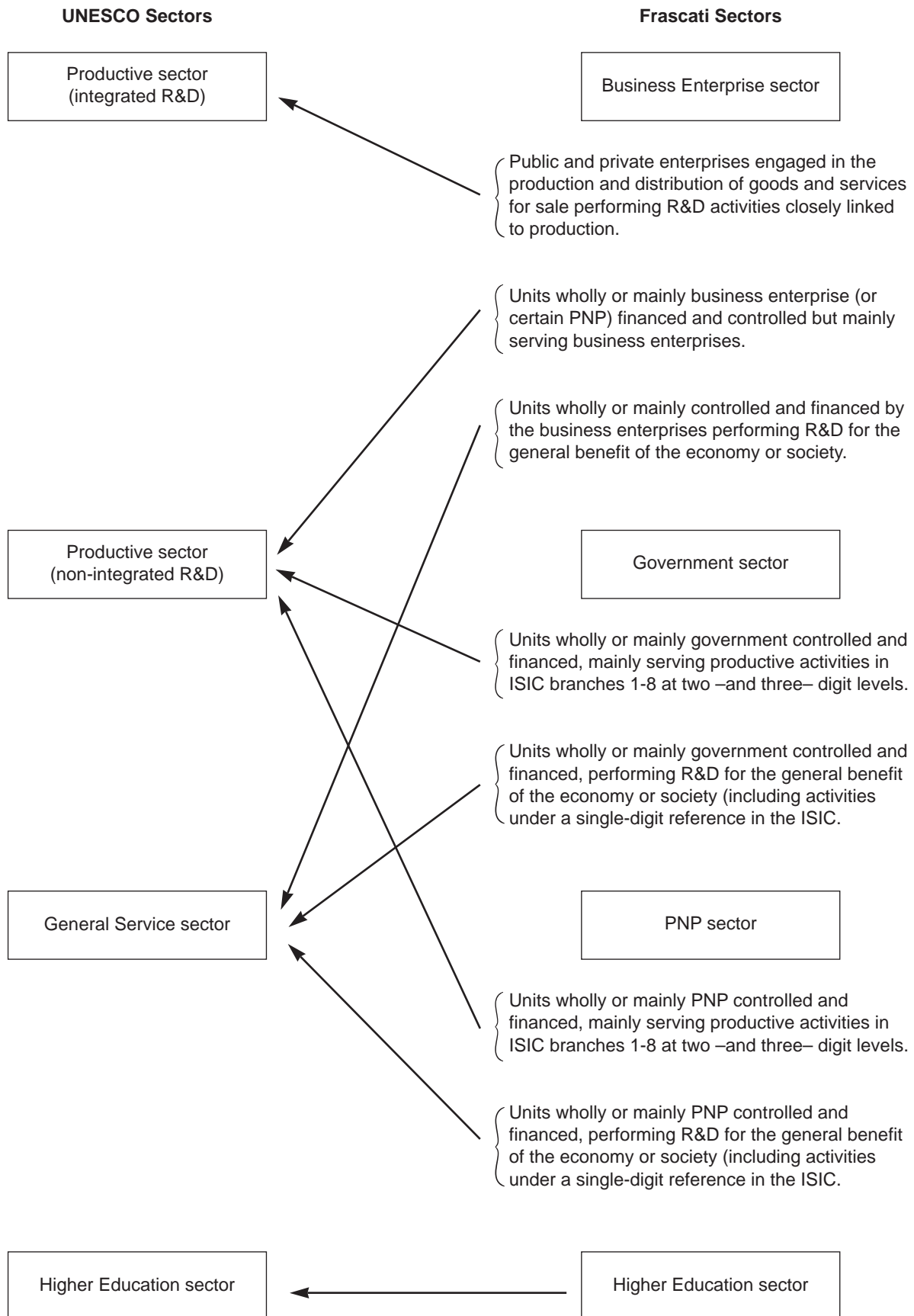
Government funds include funds provided by the central (federal), state or local authorities and originating from the ordinary or extraordinary budget or from extra-budgetary sources. It also covers funds received from public intermediary institutions established and wholly financed by the state (UNESCO S&T Manual, chapter IV.4.1.1). In other words, not only (direct) government funds, but also General University Funds are covered (cf. UNESCO S&T Manual, Appendix IV.4.1.1). The same structure is also followed by the Frascati Manual (see above).

Foreign funds include funds received from abroad for national R&D activities, including funds received from international organisations, foreign governments or institutions. They include also funds from organisations or companies abroad which have affiliated or parent organisations or companies situated in the domestic territory (UNESCO S&T Manual, chapter IV.4.1.3). This definition corresponds to the sector Abroad in the Frascati Manual (cf. UNESCO S&T Manual, Appendix IV.4.1.3).

The Higher Education sector does not act as an independent financial supporter of R&D activities. This sector’s own funds (e.g. income from endowments, share holdings, and property, receipts from the sale of non-R&D services such as fees from individual students, subscriptions to journals etc.) are included together with sources from the Private Non-Profit sector (cf. UNESCO S&T Manual, Appendix IV.4.1.4) under *other funds*, which cover all funds that cannot be classified under any of the preceding headings, e.g. *own funds* of establishments in the Higher Education sector, endowments and gifts.

For better comparability, the funding sectors (according to the Frascati Manual) Higher Education and Private Non-Profit have been combined to the aggregate *Other funds*.

Figure M.1: The relationship between UNESCO and Frascati sectors of performance



Source: UNESCO, S&T Manual

Table M.1: Principles for a Theoretical concordance between UNESCO and EUROSTAT/OECD R&D Data by Sector of Performance

	OECD	UNESCO	Business Enterprise sector	Government sector	Private Non-Profit sector	Higher Education sector	Total
Productive sector (integrated R&D)			Public and private enterprises engaged in the production and distribution of goods and services for sale, performing R&D activities closely linked to production.	No units	No units	No units	Total integrated R&D in UNESCO Productive sector
Productive sector (non-integrated R&D)			Units wholly or mainly business enterprise financed and controlled, mainly serving enterprises such as co-operative and other commercial, engineering, architectural and technical services, research and scientific institutions/firms n.e.c. (including some "PNP institutions and associations" serving enterprises - see FM pp 87, 90).	Units wholly or mainly government controlled and financed, mainly serving productive activities in ISIC branches 1-8 at two- and three-digit levels.	Units wholly or mainly PNP controlled and financed, mainly serving productive activities in ISIC branches 1-8 at two- and three-digit levels.	No units	Total non-integrated R&D in UNESCO Productive sector
General Service sector			Units wholly or mainly controlled and financed by the business enterprises performing R&D for the general benefit of the economy or society (probably very few units).	Units wholly or mainly government controlled and financed, performing R&D for the general benefit of the economy or society (includes most of ISIC 9).	Units wholly or mainly PNP controlled and financed, performing R&D for the general benefit of the economy or society (i.e. all OECD PNP sector less units in the box above).	No units	Total UNESCO General Service sector
Higher education sector			No units	No units	No units	Identical	Total UNESCO Higher education sector
TOTAL			Total OECD Business Enterprise sector	Total OECD Government sector	Total OECD Private Non-Profit sector	Total OECD Higher Education sector	GRAND TOTAL

Source: UNESCO, S&T Manual

Second European Report on S&T Indicators, 1997

Regional R&D data

At regional level, there is a particular problem in the case of units - particularly enterprises - which consist of two or more local units in different regions. If no additional information is available, all the intramural expenditure or the entire staff of a unit may, in extreme cases, be attributed to the region in which its headquarters are situated, including any expenditure incurred or employees working in local units in other regions. The extent of such errors varies according to the economic structure and size of the country.

As a step towards getting better regionalised R&D data Eurostat has published a manual, *The Regional Dimension of R&D and Innovation Statistics – Regional Manual*, (Eurostat, 1996). However, the regional data presented in this report are not necessarily collected in line with the recommendations of this relatively recent manual.

The regional breakdown of the Member States of the EU is based on the *Nomenclature of Territorial Units for Statistics* (NUTS, Eurostat 1995) classification, which has five levels. In this publication, up to a maximum of three levels are given for member states. Not every country is represented at every level, Denmark and Ireland, for example, have no NUTS 1 or NUTS 2 regions, which means that these two levels are identical to the whole country.

Statistical data for the Mediterranean countries

The statistical data on Mediterranean countries come from two sources: Eurostat and the countries themselves. In the latter case the data are provided by the official national statistical offices or certain ministries, e.g. for figures on students and graduates, the ministries responsible for higher education. The data supplied by Eurostat are generally taken from the system of United Nations agencies, particularly the ILO and UNESCO, and in some cases also from the OECD (for Turkey). To keep table footnotes to a minimum the explanations given by Eurostat for some of the figures by country are not included. On the other hand, explanations have been added regarding national data wherever necessary.

Except for population data (total and by age) there are significant gaps for many Mediterranean countries in the 1980-1995 time series. In the small countries with a high standard of living, such as Malta, Cyprus and Israel, statistics are produced along the same lines and principles as in European countries, and there is complete agreement between international sources and annual figures from national statistics, which are generally extremely comprehensive. However, for all the other countries, differences or discrepancies of varying degrees are found between sources and no information is available to help understand or explain the differences seen. In some cases it is not too difficult, because the underlying concepts are consistent, to fill in the missing years of a series provided by Eurostat using national data, but very often the national and international series do not correspond. The information thus has had to be juggled in order to arrive at the *best* figure.

The main problems were encountered with data on active population, unemployment, data by gender (especially for students and graduates), and finally data on researchers. For researchers there is a total lack of data on the private R&D sector (except in four countries). The public sector is badly covered and FTE calculations are not generally done by the countries themselves.

The UNESCO ISCED definitions

The United Nations Education Science and Cultural Organisation (UNESCO) developed the *International Standard Classification of Education* (ISCED) in the mid 1970s (UNESCO, 1976). This classifies qualifications both by level of attainment and by field of study. Recently ISCED has been updated (ISCED, 1997), however, as no data are as yet available collected under the ISCED 1997 standard, all data used in this report have been classified using ISCED 1976.

ISCED (1976) levels of education refer either to the educational process or a qualification obtained as a result of the education, see table M.2, below. Fuller definitions can be found in the *International Standard Classification of Education* (UNESCO, 1976) definitions.

The major problem with ISCED is that it is strongly based on the Anglo-Saxon model of further and higher education. This has major implications for a study of this type and is discussed in the next section.

ISCED levels 5 to 7

When examining student and graduate data, only aggregated ISCED levels 5, 6 and 7 data are used in this report. This corresponds, within the Anglo-Saxon structure of higher education, to sub and first university degrees plus postgraduate degrees. The reason for using aggregated data is that the ISCED system does not map well onto many continental European systems of higher education. Often, a European first degree is more equivalent to a Masters level qualification and hence many countries place these in ISCED level 7. Without access to detailed national statistics these problems cannot be consistently resolved. Furthermore even when information about the number of years of study involved in obtaining a qualification is available it does not take account of the intensity or nature of the education received. Therefore, a decision was made that for the purposes of this report ISCED levels 5, 6 and 7 would be aggregated together.

Table M.2: ISCED Levels

ISCED level	Description
0.	Education preceding the first level
1.	Education at the first level
2.	Education at the second level, first stage
3.	Education at the second level, second stage
4.	Not attributed
5.	Education at the third level, first stage, of the type that leads to an award not equivalent to a first university degree
6.	Education at the third level, first stage, of the type that leads a first university degree or equivalent
7.	Education at the third level, second stage, of the type that leads to a postgraduate university degree or equivalent
8.	Not attributed
9.	Education not defined by level

Source: UNESCO

Second European Report on S&T Indicators, 1997

It should be realised that the decision to aggregate the ISCED levels introduces almost as many problems of international comparability as it solves. In countries with many intermediate higher education qualifications the process of aggregation will overstate the output and level compared with countries with fewer intermediate qualifications. Where the process of aggregating the levels has possibly influenced the indicators this has been noted in the text.

Another problem is that countries tend to upgrade their educational system often, by classifying certain studies as higher education, which previously were not. In this way, countries can appear to become *better educated* without any *real* change having taken place.

Classification of industries on the basis of technology

Technological effort is a critical determinant of productivity growth and international competitiveness. It is not however spread evenly across the economy; this is clear, for example, from the fact that the percentage of turnover devoted to R&D (R&D intensity) is higher for certain “high-technology” manufacturing industries across countries and time. Hence the importance attached to technological criteria when classifying industries.

The construction of a complete classification of industries according to their technological intensity is fraught with difficulty. A first problem is that of the underlying concept: what is a high-technology industry? Is it one producing technology, or is it one using technology extensively? A second problem is that there is always a degree of arbitrariness in choosing the cut-off points which separate different technology classes.

The industry classification used in graphs in section 2a is based on methodology developed by the OECD. This is based on three indicators of technology intensity which reflect to different degrees “technology-producer” and “technology-user” aspects: (i) R&D expenditures divided by value added (ii) R&D expenditures divided by production; and (iii) R&D expenditures plus technology embodied in intermediate and investment goods divided by production.

These indicators were evaluated for 1990 and for the aggregate of ten OECD countries for which the embodied technology variable is available; 1990 purchasing power parities were used. The final classification was then defined on the basis of these indicators so as to be stable across all three indicators: industries classified to a superior category have a higher average intensity for all indicators than industries in an inferior category (with only one exception: petroleum, see below). This is possibly because adding embodied technology does not change the ranking in any significant way: in particular, it only affects the ranking of industries at the bottom of the scale, i.e., within the medium-low-technology category. Moreover, embodied technology intensities appear to be very highly correlated with direct R&D intensities, reinforcing the view that the latter reflect to a substantial degree the technological sophistication of a given industry.

The second problem, namely that of ‘arbitrary’ cut-offs, has been mitigated to some degree by opting for cut-off points in such a way that certain secondary conditions are satisfied in the resulting classification, viz.: (i) time stability: for neighbouring years, industries ranked in a higher category have a higher average intensity than industries in a lower category; and (ii) country-median-stability: industries classified in a higher category have a higher median intensity than industries in a lower category.

Some aspects of the resulting four-way classification of manufacturing industries into (i) high-technology; (ii) medium-high-technology; (iii) medium-low-technology; and (iv) low-technology (see Table M.3) are highlighted below.

Between the intensities of the high-technology industries and those of the medium-high-technology industries there is a clear gap, which facilitates the choice of a cut-off point. This gap exists whichever of the three indicators is used. But intensity with respect to production of professional goods (scientific instruments) has been rising as of after 1986 and is approaching the high-technology intensities.

The distinction between the medium-high and the medium-low-technology categories, as well as that between medium-low and low-technology categories, is much clearer for the intensity indicator of R&D divided by production than for the other indicators: there are clear gaps between the groups (at the chosen cut-off points) extending back more than ten years. These cut-off points define a classification which is also stable using R&D divided by value added as the indicator, although here the gaps are smaller.

Similarly, the intensity of petroleum refining with respect to value added is higher than that of electrical machinery, non-electrical machinery, other transport and rubber & plastics. The opposite is the case for intensities with respect to production. This is the only point for which the stability criterion of the classification cannot be satisfied.

The technology intensity of electrical machinery has been declining in the last 20 years, from the top of the medium-high-technology category to its bottom. That of rubber & plastics has also been declining, thereby increasing the gap to non-electrical machinery, to which it was very close at the beginning of the 1970s. On the other hand, the intensity of other transport has been rising with the result that, in the 1990s, it was identical to that of electrical machinery. The technology intensity of shipbuilding has also been rising during the last decade, justifying its inclusion in the medium-low-technology intensity category.

Table M.3: Classification of industries based on technology

	ISIC Rev. 2	1990			1980		
		R&D + acquired technology divided by production	R&D divided by production	R&D divided by production	R&D + acquired technology divided by production	R&D divided by production	R&D divided by production
High-technology industries							
Aircraft	3845	17.30	14.98	36.25	16.06	14.13	41.11
Office & computing equipment	3825	14.37	11.46	30.49	11.19	9.00	26.01
Drugs & medicines	3522	11.35	10.47	21.57	8.37	7.62	16.89
Radio, TV & communication equipment	3832	9.40	8.03	18.65	9.33	8.35	18.43
Medim-high-technology industries							
Professional goods	385	6.55	5.10	11.19	4.69	3.61	8.63
Motor vehicles	3843	4.44	3.41	13.70	3.68	2.81	10.05
Electrical machines excl. commun. equip.	383 - 3832	3.96	2.81	7.63	4.25	3.48	8.85
Chemicals excl. drugs	351 + 352 - 3522	3.84	3.20	8.96	2.67	2.15	7.60
Other transport	3842 + 38 44 + 3849	3.03	1.58	3.97	1.69	0.98	2.70
Non-electrical machinery	382 - 3825	2.58	1.74	4.58	2.00	1.32	3.48
Medium-low-technology industries							
Rubber & plastic products	355 + 356	2.47	1.07	3.02	2.20	1.08	3.27
Shipbuilding & reparting	3841	2.21	0.74	2.13	1.42	0.39	1.11
Other manufacturing	39	1.76	0.63	1.52	1.45	0.79	2.19
Non-ferrous metals	372	1.57	0.93	3.48	1.04	0.54	2.29
Non-metallic mineral & products	36	1.44	0.93	2.20	1.10	0.66	1.72
Metal products	381	1.35	0.63	1.39	1.06	0.45	1.08
Petroleum refineries & products	353 + 354	1.33	0.96	8.43	0.80	0.58	6.17
Ferrous metals	371	1.10	0.64	2.48	0.78	0.45	1.71
Low-technology industries							
Paper, products & printing	34	0.88	0.31	0.76	0.68	0.23	0.61
Textiles, apparel & leather	32	0.78	0.23	0.65	0.56	0.13	0.38
Food, beverages & tobacco	31	0.73	0.34	1.14	0.56	0.23	0.93
Wood products & furniture	33	0.65	0.18	0.47	0.55	0.14	0.39

Source: OECD, ANBERD, STAN, Input-Output and BID database

**Table M.4: Definition of the 8 industry sectors the most intensive in R&D
ISIC and NACE up to 4 digit level**

	ISIC Rev.2	ISIC Rev.3	NACE Rev.1	NACE (1970)
Aerospace	3845	3530	35.30	364
Computers & office machinery	3825	30	30	33
Electronics	3832	32, 2213	32, 22.14	344, 345.1
Instruments	385	33	33	37
Pharmaceuticals	3522	2423	24.4	257
Chemicals	351 352 ex. 3522	241, 242 ex 2423, 243 23.30	24 ex. 24.4 2330	25 ex. 257, 26
Electrical machinery	383 ex 3832	31	31	34 ex 344, 345
Motor Vehicles	3843	34	34	35

Source: Eurostat

Second European report on S&T Indicators, 1997

The 8 industry sectors the most intensive in R&D

According to OECD, 8 sectors account for almost 80% of R&D expenditures in its member countries: pharmaceuticals, electronics, computers and office equipment, aerospace, chemicals, motor vehicles, electrical machinery, and instruments, see chapter 3 of this report. Table M.4 shows in terms of various versions of ISIC and NACE the definitions used for these 8 sectors in this report.

Years used

Data on individual firms

In Dossier 1, section a, a large quantity of data is used on individual companies, unfortunately it was not always possible to use data for the same years for each variable and each company. Table M.5, below, details which years' data were used for which variable and which firm.

EU Member State data used in chapter 5

In the synoptic tables (tables 5a.1, 5b.1 and 5c.1) in chapter 5 it was not always possible to compare data from the same years for each variable and each member state. Table M.6, below, details which year was used for each variable and for each Member State.

Long Term Interest Rates

This variable refers to one or more series representing yield to maturity of government bonds or other bonds that would indicate longer term rates. These are usually referred to as Government Bond Yields. Only the more developed, more stable countries have government bonds, which leads to a coverage of only 25 countries. Definitions vary between countries, but generally there are no big comparability problems. The data are taken from Eurostat and from the IMF.

Hourly Compensation Costs for Production Workers in Manufacturing

Hourly compensation is defined as (1) all payments made directly to the worker (pay for time worked (basic time and piece rates plus overtime premiums, shift differentials, other premiums and bonuses paid regularly each pay period, and cost-of-living adjustments), pay for time not worked (vacations, holidays, and other leave, except sick leave), seasonal or irregular bonuses and other special payments, selected social allowances, and the cost of payments in kind (before payroll deductions of any kind)), and (2) employer expenditures for legally required insurance programs and contractual and private benefit plans. In addition, for some countries, compensation is adjusted for other taxes on payrolls or employment (or reduced to reflect subsidies), even if they do not finance programs that directly benefit workers, because such taxes are regarded as labour costs. For consistency, compensation is measured on an hours-worked basis for every country.

Table M.5: Years used for EU Member States data in chapter 5 synoptic tables

	D	F	UK	I	P	E	IRL	EL	B	S	DK	FIN	A	NL
RTD Expenditures														
GERD as a % of GDP	95	95	95	96	92	96	95	93	93	95	95	95	96	94
GERD financed by														
Business (%)	95	94	95	96	92	94	93	93	93	93	93	93	96	94
Government (%)	95	94	95	96	92	94	93	93	93	93	93	93	96	94
BERD as a % of GERD	95	95	95	96	92	96	95	93	93	95	95	95	93	94
BERD														
financed by business enterprise	95	94	94	96	92	94	93	93	91	93	93	93	89	94
financed by government	95	94	94	96	92	94	93	93	91	93	93	93		94
GBOARD														
(% of total gov. expenditure)	92	94	93	94	92	93	93	93	94	93	94	94		94
(as a % of GDP)	95	95	95	95		95	95	95	95	95	95	95	95	95
RTD Personnel														
RTD Personnel														
(per 1000 economically active)	93	93	93	94	95	94	93	93	95	95	95	94	93	94
Graduation rates														
(per 1000 20 to 25 years old)														
Doctorates														
(per 1000 25 to 29 year olds)	93/94	93/94	93/94	93/94		92/93	93/94	93/94	92/93	93/94	93/94	93/94	93/94	92/93
RSE per 1000 econ. active working in:														
Business Enterprise	93	94	94	94	95	94	93	93	95	93	93	93	93	94
Government	93	94	95	94	95	93	93	93	95	93	93	95	93	94
Higher Education	93	94	94	94	95	94	94	93	95	95	93	95	93	94
Performance Indicators														
USPTO patents (per 1000 population)	94	94	94	94		94	94		94	94	94	94	94	94
EPO patents (per 1000 population)	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Publications (per 1000 population)	95	95	95	95	95	95	95	95	95	95	95	95	95	95
Hightech exports/ Export total	95	95	95	95	95	95	95	95	B+L 95	95	95	95	95	95
Technology Balance of Payments (receipts / payment)	95	92	95	95	85	95			95	93	85	90	95	92

Source: DG XII-AS-4

Second European Report on S&T Indicators, 1997

Production workers generally include those employees who are engaged in fabricating, assembly, and related activities; material handling, warehousing, and shipping; maintenance and repair; janitorial and guard services; auxiliary production (e.g., power plants); and other services closely related to the above activities. Working supervisors are generally included; apprentices and other trainees are generally excluded.

Data from the US Bureau of Labor Statistics (BLS) have been used. Their definition of hourly compensation costs is not the same as the International Labour Office (ILO) definition of total labour costs. Hourly compensation costs do not include all items of labour costs. The costs of recruitment, employee training, and plant facilities and services (such as cafeterias and medical clinics) are not included because data are not available for most countries. The labour costs not included account for no more than 4 percent of total labour costs in any country for which data are available.

Measurement issues in productivity

Several measurement and data issues are intrinsic to indicators of productivity and have to be borne in mind if misinterpretation of productivity measures is to be avoided. They relate to the type of productivity measure used, the choice of data for measuring inputs and outputs, and the deflation method.

Table M.6: Years used for individual firm data

COMPANY NAME	Country	Collab. 93/94/95	Employ. 90/94/95	Sales 90/95	R&D 90/94/95	Publication 85 - 95	EPO Patents 93/94/95	USPTO Patents 85/93/94/95	EC Part. 3+4 FP
ABB ASEA BROWN BOVERI	CH	-	-	-	-	85-95	93/94/95	93/94/95	3+4
ABBOTT LABORATORIES	US	15	90/94/95	90/95	90/94/95	85-95	93/94/95	-	-
AEROSPATIALE	F	8	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
AICHI MACHINE INDUSTRY	JP	-	-	-	-	-	-	85/93/94/95	-
AIR PRODUCTS & CHEM	US	6	90/94/95	90/95	90/94/95	85-95	93/94/95	-	3
AISIN SEIKI	JP	-	-	-	-	86/87/88/89/90 /92/94/95	93/94/95	85/93/94/95	-
AKZO	NL	1	90/94/95	90/95	90/94/95	85-94	93/94/95	85/93/94/95	3+4
AKZO NOBEL	-	-	-	-	-	95	-	-	-
ALCATEL ALSTHOM	F	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
ALLIEDSIGNAL	US	10	90/94/95	90/95	90/94/95	86-95	93/94/95	93/94/95	4
ALPS ELECTRIC	JP	2	-	-	-	87-95	-	85/93/94/95	-
AMERICAN CYANAMID	US	13	-	-	-	85-95	-	85/93/94/95	-
AMERICAN HOME PRODUCTS	US	3	90/94/95	90/95	90/94/95	94+95	93/94/95	85/93/94/95	-
AMP	US	6	90/94/95	90/95	90/94/95	85/87/88/89/90/ 91/92/93/94/95	93/94/95	85/93/94/95	-
APPLE COMPUTER	US	77	90/94/95	90/95	90/94/95	85/86/88/89/90 /91/92/93/94/95	93/94/95	85/93/94/95	-
ASAHI CHEMICAL INDUSTRY	JP	13	-	-	-	85-95	93/94/95	85/93/94/95	-
ASTRA	S	14	90	90/95	90/94/95	-	93/94/95	85/93/94/95	4
BASF	D	12	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	3+4
BAYER	D	13	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
BMW	D	3	-	-	-	85/86/87/88/89 /90/91/93/94/95	93/94/95	93/94/95	3+4
BOC GROUP	UK	6	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
BOEHRINGER INGELHEIM	D	28	-	-	-	85-95	93/94/95	85/93/94/95	4
BOEING	US	12	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
BOMBARDIER	CA	3	90/94/95	90/95	90/94/95	-	93/94/95	93/94	-
BRISTOL-MYERS SQUIBB	US	24	90/94/95	90/95	90/94/95	89-95	93/94/95	93/94/95	-
BRITISH AEROSPACE	UK	6	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3
BULL FRANCE	F	10	90/94/95	90/95	90/94/95	85-94	93/94/95	85/93/94/95	3+4
BURMAH CASTROL	UK	-	90	90/95	90/94/95	87/90/91/92	93/94/95	94	4
CASIO COMPUTER	JP	1	-	-	-	85/88/89/90 /91/92/93/94/95	93/94/95	85/93/94/95	-
CEA-INDUSTRY	FR	2	-	-	-	90	93/94/95	-	-
CHRYSLER	US	10	90/94/95	90/95	90/94/95	85/86/89/90 /91/92/93/94/95	93/94/95	85/93/94/95	-
CIBAGEIGY	CH	31	90/94/95	90/95	90/94/95	85-95	93/94/95	85/95	3+4
COMPAQ COMPUTER	US	33	90/94/95	90/95	90/94/95	-	93/94/95	85/93/94/95	-
COOPER INDUSTRIES	US	2	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
COURTAULDS	UK	1	90	90/95	90/94/95	85/87/88/89/90 91/92/93/94/95	93/94/95	85/93/94/95	3
DAEWOO Electronics	KR	1	-	-	-	-	93/94/95	85/93/94/95	-
DAIHATSU MOTOR CO	JP	1	-	-	-	85/86/92/93/94	-	85/93/94/95	-
DAIMLER-BENZ	D	12	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
DAINIPPON INK&CHEM	JP	3	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	-
DANA	US	-	90/94/95	90/95	90/94/95	86	93/94/95	85/93/94/95	-
DELL COMPUTER	US	-	90/94/95	90/95	90/94/95	-	-	-	-
DIGITAL EQUIPMENT	US	47	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3
DOW CHEMICAL	US	31	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
DSM	NL	-	-	-	-	85-95	93/94/95	85/93/94/95	3
E. MERCK	D	37	-	-	-	85-95	93/94/95	85/93/94/95	-
EATON	US	4	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
EI DUPONT de Nemours	F	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
ELECTROLUX	S	2	90/94/95	90/95	90/94/95	-	93/94/95	85/93/94/95	4
ELILILLY	US	35	90/94/95	90/95	90/94/95	85-95	93/94/95	-	-
EMERSON ELECTRIC	US	-	90/94/95	90/95	90/94/95	85/86/87/88/91 /92/93/94/95	93/94/95	85/93/94/95	-

Table M.6: Years used for individual firm data (continued)

COMPANY NAME	Country	Collab. 93/94/95	Employ. 90/94/95	Sales 90/95	R&D 90/94/95	Publication 85 - 95	EPO Patents 93/94/95	USPTO Patents 85/93/94/95	EC Part. 3+4 FP
FIAT	I	18	-	-	-	85/86/87/89/90 /92/94/95	93/94/95	-	3+4
FMC	US	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3
FORD MOTOR	US	24	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
Jaguar plc acq. in 1990			-	-	-	-	0	-	-
FUJI ELECTRIC	JP	7	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
FUJI HEAVY INDUSTRIES	JP	1	-	-	-	85/86/87/88 /89/90/91/92	93/94/95	-	-
FUJITSU	JP	89	-	-	-	-	93/94/95	85/93/94/95	-
GENERAL DYNAMICS	US	4	-	-	-	85-95	-	85/93/94/95	-
GENERAL ELECTRIC	US	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
GENERAL ELECTRIC CO	UK	33	-	-	-	85-95	93/94/95	85/93/94/95	3
GENERAL MOTORS	US	18	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
GKN	UK	1	-	-	-	85/86/88/89 /90/93/94/95	93/94/95	85/93/94/95	4
GLAXO HOLDINGS	UK	36	90/94/95	90/95	90/94/95	85-94	93/94/95	85/93/94/95	4
GOLDSTAR	KR	6	-	-	-	-	93/94/95	93/94/95	-
GRUMANN	US	-	-	-	-	85-95	93/94/95	-	-
HARRIS	US	10	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
HERCULES	US	2	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
HEWLETT-PACKARD	US	113	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
HINO MOTORS	JP	-	-	-	-	85/86/94/95	-	85/93/94/95	-
HITACHI	JP	62	-	-	-	85-95	93/94/95	85/93/94/95	-
HOECHST	D	-	90/94/95	90/95	90/94/95	85-95	93/94/95	-	3+4
HONDA MOTOR	JP	4	90/94/95	90/95	90/94/95	85/86/87/89/90 91/94/95	93/94/95	85/93/94/95	-
HULS	D	-	-	-	-	85-95	93/94/95	85/93/94/95	-
HYUNDAI MOTOR CO	KR	6	-	-	-	-	93/94/95	93/94/95	-
IMPERIAL CHEMICAL INDUSTRIES	UK	3	-	-	-	85-95	93/94/95	85/93/94/95	3+4
INTEL	US	54	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
INTL BUSINESS MACHINES	US	210	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
INVESTOR	S	-	-	-	-	-	93/94/95	-	-
ISUZU MOTORS	JP	-	-	-	-	85/86/94/95	93/94/95	85/93/94/95	-
JOHNSON&JOHNSON	US	11	90/94/95	90/95	90/94/95	85-95	93/94/95	-	-
KANTO AUTO WORKS	JP	-	-	-	-	-	-	85/93/94/95	-
KIA MOTORS	KR	2	-	-	-	-	-	85/93/95	-
KOC Holding	TR	-	-	-	-	-	-	85/94/95	-
KYOCERA	JP	5	90	90/95	90/94	85/86/87/88/90 91/92/93/94/95	93/94/95	85/93/94/95	-
KYOWA HAKKO KOGYO	JP	5	-	-	-	85-95	-	85/93/94/95	-
L' AIR LIQUIDE	F	1	90/94/95	90/95	90/94/95	85/86/88/89/90 91/92/93/94/95	93/94/95	85/93/94/95	-
L.M. ERICSSONS	S	16	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	3
LITTON INDUSTRIES	US	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
LOCKHEED	US	23	90/94/95	90/95	90/94/95	85-94	93/94/95	85/93/94/95	-
L'OREAL	US	13	-	-	-	-	-	85/93/94/95	-
LUCAS INDUSTRIES	UK	3	-	-	-	85-95	93/94/95	85/93/94/95	3+4
LYONDELL PETRO	US	-	-	-	-	-	-	93/94/95	-
MAN	D	2	90/94/95	90/95	90/94	85/86/87/89/90/ 91/92/93/94/95	93/94/95	85/93/94/95	3
MARTIN MARRIETTA	US	-	-	-	-	85-94	-	85/93/94/95	-
MATSUSHITA ELECTRIC Industrial	JP	45	-	-	-	85-95	93/94/95	85/93/94/95	-
MATSUSHITA ELECTRIC Works	JP	2	-	-	-	85/86/89/90/91 /92/93/94/95	94/95	-	-
MAYTAG	US	-	-	-	-	-	-	85/93/94/95	-
MAZDA MOTOR	JP	9	-	-	-	85-95	93/94/95	85/93/94/95	-
McDONNELL DOUGLAS	US	11	90/94/95	90/95	90/94/95	85-95	93/94/95	85/95	-
MERCK	US	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3

Table M.6: Years used for individual firm data (continued)

COMPANY NAME	Country	Collab. 93/94/95	Employ. 90/94/95	Sales 90/95	R&D 90/94/95	Publication 85 - 95	EPO Patents 93/94/95	USPTO Patents 85/93/94/95	EC Part. 3+4 FP
MINOLTA	JP	3	-	-	-	85/86/90/91/92/ 93/94	94/95	85/93/94/95	-
mitsubishi electric	JP	54	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	-
mitsubishi kasei	JP	20	-	-	-	85-95	93/94/95	-	-
mitsubishi motors	JP	7	90/94/95	90/95	90/94	85/86/90/91/92 93/94/95	93/94/95	-	-
mitsubishi petrochemicals	JP	4	-	-	-	85-95	93/94/95	85/93/94/95	-
mitsui petrochem	JP	5	-	-	-	85-95	93/94/95	-	-
mitsui toatsu chem	JP	7	-	-	-	85-95	94/95	-	-
monsanto	US	22	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
motorola	US	81	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3
navistar international	US	-	90/94/95	90/95	90/94/95	-	-	93/94/95	-
NEC	JP	92	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
nippondenso	JP	1	-	-	-	85-95	93/94/95	85/93/94/95	-
NISSAN MOTOR	JP	9	-	-	-	85-95	93/94/95	85/93/94/95	-
NISSAN SHATAI	JP	6	-	-	-	0	-	-	-
NOBEL INDUSTRIES	S	-	-	-	-	86/89/90/91/93	93/94/95	85/93/94/95	-
NOKIA	FIN	9	90/95	90/95	90/94/95	86-95	93/94/95	85/93/94/95	-
NORSK HYDRO	NO	1	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
NORTHERN TELECOM	CA	55	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
STC (Northern Telecom)						85-90			
OCCIDENTAL PETROLEUM	US	1	90/94/95	90/95	90/94/95	85/87/89/90/91/92	93/94/95	85/93/94/95	-
OKI ELECTRIC INDUSTRY	JP	36	-	-	-	85-95	93/94/95	85/93/94/95	-
OLIVETTI	I	13	-	-	-	85/86/87/88/89/ 92/93/94	93/94/95	85/93/94/95	3
OMRON	JP	7	-	-	-	85/86/87/88/89/ 90/92/93/94/95	93/94/95	85/93/94/95	-
PACCAR	US	-	90/94/95	90/95	90/94/95	0	-	85/93/94/95	-
PEUGEOT	F	4	90/94/95	90/95	90/94/95	86/90/91/92/93/ 94/95	93/94/95	85/93/94/95	3+4
PFIZER	US	31	90/94/95	90/95	90/94/95	85-86	93/94/95	85/93/94/95	-
PHARMACIA	S	11	90/94/95	90/95	90/94/95	93-95	93/94/95	85/93/94/95	-
PHILIPS ELECTRONICS	NL	37	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
PIONEER ELECTRONIC	JP	10	90/94/95	90/95	90/94/95	86/88/89/90/91/ 92/93/94/95	93/94/95	85/93/94/95	3
PITNEY BOWES	US	-	90/94/95	90/95	90/94/95	85/89/91/92/93/94	93/94/95	85/93/94/95	-
PPG INDUSTRIES	US	1	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
RAYTHEON	US	5	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
RENAULT	F	3	-	-	-	85/90/91/92/ 93/94/95	93/94/95	85/93/94/95	3+4
RHONE-POULENC	F	28	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
RICOH	JP	5	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	-
ROBERT BOSCH	D	5	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
ROCHE	CH	35	94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
ROCKWELL INTERNATIONAL	US	25	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
ROHM&HAAS	US	10	90/94/95	90/95	90/94/95	85-95	93/94/95	-	-
ROLLS-ROYCE	UK	6	90	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
SAMSUNG	KR	26	-	-	-	-	93/94/95	85/93/94/95	-
SANDOZ	CH	13	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
SANKYO	JP	6	-	-	-	85-95	93/94/95	85/93/94/95	-
SANYO ELECTRIC	JP	25	-	-	-	85-95	93/94/95	85/93/94/95	-
SCHERING	D	9	90	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
SCHERING-PLOUGH	US	15	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
SCHNEIDER	F	2	-	-	-	-	93/94/95	85/93/94/95	-
SEAGATE TECHNOLOGY	US	3	90/94/95	90/95	90/94/95	-	93/94/95	93/94/95	-
SEKISUI CHEMICAL	JP	-	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	-
SHARP	JP	16	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
SHERMIN-WILLIAMS	US	-	90/94/95	90/95	90/94/95	86-95	93/94	-	-

Table M.6: Years used for individual firm data (continued)

COMPANY NAME	Country	Collab. 93/94/95	Employ. 90/94/95	Sales 90/95	R&D 90/94/95	Publication 85 - 95	EPO Patents 93/94/95	USPTO Patents 85/93/94/95	EC Part. 3+4 FP
SHIN-ETSU CHEMICAL	JP	5	-	-	-	85-95	93/94/95	85/93/94/95	-
SHIONOGI	D	1	-	-	-	85-95	93/94/95	85/93/94/95	-
SHOWA DENKO	JP	4	-	-	-	85-95	93/94/95	85/93/94/95	-
SIEMENS	D	69	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
SMITHKLINE BEECHAM	UK	37	90/94/95	90/95	90/94/95	89-95	93/94/95	93/94/95	3+4
SNECMA	F	6	-	-	-	89/91/92/93/94/95	93/94/95	93/94/95	-
SOLVAY	B	4	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
SONY	JP	57	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	3
SUMITOMO CHEMICAL	JP	32	-	-	-	85-95	93/94/95	85/93/94/95	-
SUN MICROSYSTEMS	US	46	90/94/95	90/95	90/94/95	85/86/88/89/90/ 91/92/93/94/95	93/94/95	85/93/94/95	-
SUZUKI MOTOR	JP	2	-	-	-	85-95	93/94/95	85/93/94/95	-
TAKEDA CHEM IND	JP	4	-	-	-	85-95	93/94/95	85/93/94/95	-
TDK	JP	2	-	-	-	85-95	93/94/95	85/93/94/95	-
TEXAS INSTRUMENTS	US	31	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
TEXTRON	US	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
THOMSON	F	23	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	3+4
TOSHIBA	JP	94	90/94/95	90/95	90/94	85-95	93/94/95	85/93/94/95	-
TOSOH	JP	4	-	-	-	88-95	93/94/95	-	-
TOYOBO	JP	-	-	-	-	85-95	93/94/95	-	-
TOYODA AUTO LOOM WORKS	JP	JP	3	-	-	-	86-95	93/94/95	-
TOYOTA AUTO BODY	JP	-	-	-	-	0	-	-	-
TOYOTA MOTOR	JP	8	-	-	-	85-95	93/94/95	85/93/94/95	-
TRW	US	10	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
UNION CARBIDE	US	6	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
UNISYS	US	35	90/94/95	90/95	90/94/95	86-95	93/94/95	93/94/95	-
UNITED TECHNOLOGIES	US	9	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
UPIJOHN	US	11	-	-	-	85-95	-	85/93/94/95	-
VALEO	F	-	90	90/95	90/94/95	95	93/94/95	85/93/94/95	3+4
VOLKSWAGEN	D	4	-	-	-	85/86/87/88/90 91/92/93/94	93/94/95	93/94/95	3+4
VOLVO	S	6	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
WARNER-LAMBERT	US	10	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
WELLCOME	UK	-	-	-	-	85-94	-	85/93/94/95	-
WESTINGHOUSE ELECTRIC	US	21	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	-
WHIRPOOL	US	-	90/94/95	90/95	90/94/95	85/86/87/88/91/ 92/93/94	93/94/95	85/93/94/95	4
EI DUPONT de Nemours	F	-	90/94/95	90/95	90/94/95	85-95	93/94/95	85/93/94/95	3+4
WR GRACE	US	5	-	-	-	85-95	93/94/95	-	-
YAMAHA MOTOR	JP	1	-	-	-	86/90/91/92/94/95	93/94/95	85/93/94/95	-
YAMANOUCHI PHARM.	JP	4	-	-	-	-	93/94/95	85/93/94/95	-
ZENECA	UK	20	-	-	-	93-95	93/94/95	94/95	3+4
ZF FRIEDRICHSHAFEN	D	2	-	-	-	94	93/94/95	-	3
ZF ZEPPELIN STIFTUNG	D	-	-	-	-	-	93/95	-	-

Source: DG XII-AS-4

Second European Report on S&T Indicators, 1997

Choice of productivity measure

Labour productivity measures the ratio between output and labour input in production. Its rate of change reflects movements in productive efficiency or shifts within the production function. Although a more comprehensive coverage of inputs, including capital services and materials, would be preferable, measurement problems mean that this is often the only readily available indicator. Total factor productivity (TFP) measures the ratio between output and a weighted set of inputs. Unlike labour productivity, TFP takes into account all inputs (labour and capital where output is defined as value-added, and labour, capital and intermediate inputs where a gross output measure is used). While labour productivity reflects both changes in production efficiency and effects of substitution of other inputs for labour, the TFP measure makes allowance for the effects of substitution and, in consequence, approximates more closely to a measure of overall efficiency.

Choice of output measure: gross output vs. value-added

The choice between gross output and value-added as measures of output is mainly governed by data availability. For TFP measures, whose objective is to reflect the efficiency of production processes, the preferred concept is that of gross output in conjunction with measures of primary and intermediate inputs. Where information on intermediate inputs is missing or in the case of simple labour productivity, value-added may be preferable as it avoids biases due to changes in the structure of the production process. For example, a rise in the share of intermediate inputs (through contracting out of certain activities) leads to a decline in employment but leaves gross output unchanged. Clearly, this will give rise to an erroneous indication of a rise in labour productivity.

Choice of input measure: labour input

For reasons of data availability, the number of employed persons is frequently chosen as a proxy for labour input. Although employee data have fewer methodological problems, data on hours worked are preferable for purposes of productivity measurement. In many European countries, for example, the average number of hours worked per employee has steadily declined. As a result, when measurement is by reference to the number of employees, genuine labour input is overstated and genuine productivity growth understated. The converse holds true in the case of Japan. Further, restricting labour input to employees omits the self-employed and unpaid family members. Finally, basic measures of labour input do not differentiate between disparate qualities of labour and workforce composition.

Method of deflation

Derivation of volume measures for output and for intermediate inputs poses one of the most difficult problems in productivity measurement. Price series used to deflate current-price measures of output often fail adequately to reflect rapid quality changes, such as those associated with information technology products. The large discrepancies that exist between quality-adjusted and traditional price series for those industries can impact substantively on measured productivity changes. Accurate deflation of value-added (double deflation) also relies on the availability of deflators for gross output and intermediate inputs - data that are often unavailable.

A. Science and Technology Indicators

A.1 Government R&D Appropriations – GBAORD

Government R&D appropriations means all appropriations by central government allocated to R&D in central government budgets. Data on government R&D appropriations therefore refer to budget provisions, not to actual expenditure. The figures on actual expenditure, which are not available in their final form until some time after the end of the budget year concerned, may well differ from the original budget provisions.

There are two types of budget: final and provisional. The final budgets of all countries covered by this publication are currently available up to and including 1994 and for some countries also for 1995. The provisional budgets for 1995 and 1996 refer to the original budget provisions, which are subject to change.

Despite all efforts, the concepts and methods used by the individual countries for collecting data on government R&D appropriations are not completely uniform. One methodological discrepancy lies in the treatment of transfers of funds for R&D purposes by the European Commission to organisations in the Member States. Some of the Member States record such transfers under national government R&D appropriations which leads to double counting.

Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets – NABS

Government R&D appropriations of the EU Member States are broken down by socio-economic objectives on the basis of the *Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets* (NABS) developed by the European Commission. The 1983 version of NABS applies to all the figures up until the 1992 final budgets and the 1993 provisional budgets. The 1993 version of NABS (Eurostat, 1994), see table M.A.1 below, applies from the 1993 final and the 1994 provisional budgets onwards. As a result of the revision of the NABS, the data for some 1- and 2-digit NABS headings cannot really be compared with those in earlier publications. The largest differences are to be found in chapters 1, 3, 5, 7, 10 and 11 of the NABS.

The figures for Austria, Finland, and Sweden as well as the non-EU OECD countries are based on a comparable OECD classification, which has been aligned with the NABS as far as is possible (FM, p 120). Figures for the Eastern European countries are from national sources.

In order to arrive at politically more interesting groups, some NABS-classes have been combined. Specifically, the NABS-classes 1, 5, 7, and 9 have been aggregated to form Human and Social Objectives and the NABS classes 2, 3, 4, and 8 form together the Technological Objectives.

Table M.A.1: NABS-chapters

1	Exploration and exploitation of the Earth
2	Infrastructure and general planning of land use
3	Control and care of the environment
4	Protection and improvement of human health
5	Production, distribution and rational utilisation of energy
6	Agricultural production and technology
7	Industrial production and technology
8	Social structures and relationships
9	Exploration and exploitation of space
10	Research financed from General University Funds (GUF)
11	Non-oriented research
12	Other civil research
13	Defence

Source: Eurostat - Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets

Second European Report on S&T Indicators, 1997

A.2 R&D Expenditure

Expenditures on R&D may be spent within the statistical unit (intramural) or outside it. The basic procedures for measuring these expenditures are:

- to identify the intramural expenditure on R&D *performed* by each statistical unit;
- to identify the *sources of funds* for these intramural R&D expenditures.

The collection of extramural expenditures is, though desirable, generally dispensed with.

Intramural expenditures are all expenditures for R&D performed within a statistical unit or sector of the economy, whatever the source of funds. Expenditures made outside the statistical unit or sector but in support of intramural R&D are included. Both current expenditure such as employment costs or expenditure on materials and capital expenditure, for example on buildings or equipment, are included. The sum of the intramural expenditure on R&D across all reporting units or sectors is equivalent to gross domestic expenditure.

UNESCO, which is the main source of R&D data for non-EU/OECD countries, uses the same definition of research and experimental development (R&D) as the one given in the Frascati Manual (see UNESCO S&T Manual, chapter II.1.1). In fact, the OECD has tried to make the Frascati Manual consistent with UNESCO recommendations for all scientific and technological activities, being specific to R&D and the needs of OECD Member countries whose rather similar economic and scientific systems distinguish them from non-OECD countries. For a comparison of the concepts presented in the UNESCO S&T Manual and the Frascati Manual, see also the Appendix D of the first.

UNESCO, however, collects data on *Total Domestic Expenditure on R&D* which is the sum of the intramural expenditures *incurred* by the national institutions (cf. UNESCO S&T Manual, chapter IV.1 and 2.3). This means that, in theory, the Total Domestic Expenditure on R&D covers a wider range than GERD, since it also includes R&D expenditure in installations physically situated abroad but used by national institutions (see also UNESCO S&T Manual, Appendix IV.2).

Where possible, the data available from international institutions (Eurostat, OECD, UNESCO) have been supplemented with data collected from national sources. In some cases, these data have already been surveyed according to the recommendations of the Frascati Manual. In all other cases, attempts have been made to align the national data as far as possible with the above mentioned standards. However, often only a rough correspondence could be achieved. For example, for some Central and Eastern European countries and some other non-OECD member countries even until the most recent years the UNESCO concept of *Science and Technology* has been used instead of OECD concept of *Research and Development*. This means that the data for these countries tend to be overestimated in comparison with other countries.

In the economies in transition, where political and economic transformations started in the late 1980s and early 1990s, work has started on revising national statistical systems to the OECD Frascati standards. Although these countries have managed to standardise their R&D statistics to a greater or lesser degree, in most cases the revisions of statistical concepts and classifications were not accompanied by the re-estimation of retrospective time series. Therefore data for these countries differ in quality: in terms of time series continuity, use of proper sectoral classifications, coverage of expenditures and availability of required breakdowns. Thus the Czech Republic data still refer to the broader category of S&T rather than R&D. Defence R&D is not always covered. For chapter 8, in some cases, estimations were made in an attempt to make data comparable.

A.3 R&D Personnel

R&D personnel comprise all persons employed *directly* on R&D, as well as those providing *direct* services such as R&D managers, administrators, and clerical staff. Those providing an *indirect* service, such as canteen and security staff, should be excluded, even though their wages and salaries are included as an overhead cost in the measurement of expenditure (cf. Frascati Manual, p 81).

Following the classification by occupation, the following types of R&D personnel can be distinguished:

Researchers (or *Scientists & Engineers*) are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, and in the management of the projects concerned.

Technicians and equivalent staff are persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life sciences, or social sciences and humanities. They participate in R&D by performing scientific and technical tasks involving the application of concepts and operational methods, normally under the supervision of researchers. Equivalent staff perform the corresponding R&D tasks under the supervision of researchers in the social sciences and humanities.

Other supporting staff include skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects.

R&D may be the primary function of some persons (e.g. workers in an R&D laboratory) or it may be a secondary function (e.g. members of a design and testing establishment). It may also be a significant part-time activity (e.g. university teachers or post-graduate students). To count only persons employed in R&D establishments would result in an underestimate of the effort devoted to R&D; to do a *headcount* of everyone spending some time on R&D would lead to an overestimate. The number of persons engaged in R&D should, therefore, be expressed in *full-time equivalents (FTE)*. (cf. Frascati Manual, par. 295 ff.)

Both the Frascati Manual and the UNESCO S&T Manual distinguish, apart from the measurement in full-time equivalents (FTE), full-time and part-time S&T personnel.

Full-time scientific and technical personnel (FT) are defined as those personnel who devote all or almost all their working time (i.e. more than 90%) to a given scientific and technological activity (UNESCO S&T Manual, chapter III.3.1; Frascati Manual, p 83).

Part-time scientific and technical personnel (PT) are defined as those personnel who devote only part of their working time to a given scientific and technological activity (UNESCO S&T Manual, chapter III.3.2; Frascati Manual, p 83).

In the tables of the statistical annex data on R&D personnel are provided as far as possible in full-time equivalents. Deviations are indicated in the footnotes.

Human Resources in Science and Technology

The OECD *Manual on the Measurement of Human Resources devoted to S&T “Canberra Manual”* (OECD, 1994) uses a wide, non Anglo-Saxon definition of science and technology. This means that it measures the numbers of people with a qualification at ISCED levels 5, 6 and 7 (i.e. a third level qualification), as well as those without these qualifications, employed in a S&T occupation where such a qualification is normally required.

Table M.A.2 gives an abridged version of the main HRST stock groups, as defined in the Eurostat paper “*Basic Indicators for Describing the Stock of Human Resources in Science and Technology (HRST)*”, (Eurostat, 1995).

The population of interest consists of all those in S&T occupations regardless of their educational attainment and also those with ISCED 5, 6 or 7 qualifications not in S&T occupations, unemployed or inactive. This is known as the HRST population.

- The ‘Core’ HRST population, or HRSTC, are those who are both in a S&T occupation and with an educational qualification at ISCED level 5, 6 or 7.
- The occupationally qualified HRST population, or HRSTO, consists of all those in a S&T occupation regardless of their educational attainment.
- And the educationally qualified HRST population, or HRSTE, consists of all persons with an ISCED level 5, 6 or 7 qualification regardless of their occupation or employment status.

Table M.A.2: The main HRST Stock Categories

	Those qualified to ISCED 5, 6 and 7	Those qualified to below ISCED 5
<i>S&T Occupations</i>		
Managers – ISCO 122, 123, 131	HRSTC	HRSTW
Professionals – ISCO 2		
Technicians – ISCO 3		
<i>Non S&T Occupations</i>		
Other managers – ISCO 1 nec	HRSTN	
Armed forces – ISCO 0		
All other occupations		
Unemployed	HRSTU	
Inactive	HRST1	

Source: Eurostat - Basic Indicators for Describing the Stock of Human Resources in Science and Technology

Second European Report on S&T Indicators, 1997

The *Canberra Manual* introduces the concept of S&T occupations, which are defined in terms of ISCO-88 (the International Standard Classification of Occupations as revised in 1988) (ILO, 1990). The S&T occupations include managers from three critical managerial occupational categories (ISCO 122, 123 and 131) plus all those in Professional occupations (ISCO 2) and all those in Technician occupations (ISCO 3).

The Educationally qualified HRST population (HRSTE) can be further broken down into:

- HRSTN - qualified but working in a non-S&T occupation
- HRSTU - qualified but unemployed
- HRSTI - qualified but inactive

Possible problems and sources of HRST data

The *Canberra Manual* is relatively new and uses data defined using two different international classifications, ISCO-88 and ISCED. The two different international definitions cause problems when the national data have to be converted into the international classifications, as each conversion introduces slight discrepancies and the intersection of the two has even more discrepancies. Thus, for the moment, the only HRST data that is currently available is that from a Eurostat/OECD pilot survey.

Most of the data supplied from the pilot survey comes from Labour Force Surveys; these are sample surveys and this means that the estimates are subject to sampling error. No estimates of the extent of the sampling error have been made. Equally no estimates of the possible errors introduced by conversion from national classifications to international classifications have yet been made. This means that the HRST data presented here should be treated with caution.

A.4 Graduates

This report concentrates on the overall total of graduates at ISCED levels 5 to 7 and the numbers in the *Canberra Manual* categories of 'Natural Sciences' and 'Engineering and Technology'. A further category which combines the two above categories Natural Science and Engineering (NSE) is also used.

ISCED, as described in the first part of this annex, also classifies educational courses and their subsequent qualifications by field of study. Within ISCED there are 21 two digit codes - of which one only exists at the ISCED 2 level, and therefore is of no in-

Table M.A.3: ISCED field of study aggregations

Aggregated field of study	ISCED-no.	Field of study
Natural sciences	42	Natural science
	46	Mathematics and computer science
Engineering and technology	54	Engineering
	58	Architecture and town planning
	52	Trade, craft and industrial programmes
	70	Transport and communications
	50	Medical science and health related
Medical sciences	50	Medical science and health related
Agricultural sciences	62	Agriculture, forestry and fishery
Social sciences	38	Law
	30	Social and behavioural science
	34	Commercial and business administration
	84	Mass communication and documentation
	66	Home economics (domestic science)
Humanities	22	Humanities
	26	Religion and theology
	18	Fine and applied arts
Teacher training	14	Education science and teacher training
Other fields	78	Service trades
	01	General programmes
	89	Other programmes

Source: OECD 'Canberra' Manual

Second European Report on S&T Indicators, 1997

terest for the report -describing the field of study. The *Canberra Manual* suggests aggregating these up into seven categories. This not only takes some account of the problems many countries have with the subject classification, but also generates groups of more science policy interest. There is only one problem, with Teacher training. In some countries people study a certain subject and later follow a short course to become a teacher. These people are counted in their original field of study. In other countries there is a separate higher education/training system for teachers. This means data for this field of study suffer from a severe lack of comparability between countries. For this reason in the report Teacher training has been combined with Other fields. The ISCED two digit categories and the field of study aggregates are given in Table M.A.3.

A.5 Bibliometrics

Bibliometrics is the application of mathematical and statistical methods to scientific literature, patents and other means of communication. It is a method which makes it possible to estimate scientific production, i.e. bibliometrics is a tool by which the state of science and technology can be observed through the overall production of scientific publications.

Bibliometrics is based on the principle that the essence of the production of scientific research is “knowledge” and that scientific knowledge is manifested in scientific literature. Of course, the scientific activity is much more complex and multi-faceted than what is captured by indicators focusing on publications only. Bibliometric indicators mainly refer to basic research, much of which is carried out in academic institutions.

Bibliometrics measure the quantity, the quality and the visibility of research. It is important to mention that the indicators are based on a comparative approach, i.e. indicators are only indicative in comparison with the values of other groups. The limitations of bibliometric data mainly concern the existence of various means of communication to transmit scientific information outside publications. The propensity to publish and cite varies, e.g. industrial research and defence-related research is often not published. The most appropriate method how to count has to be chosen, the most appropriate set of journals to refer to has to be found. The fact that the number of scientific journals changes over time has to be considered in analysis over time.

Some other points to mention are:

- works of great importance rapidly become part of a common knowledge and are thus referred to in the literature without citation;
- citations may be critical rather than positive; however it has been argued that even contested results make a contribution to knowledge;
- the various scientific fields are cultivated by groups of varying size, and thus the probability of being cited varies from sector to sector;
- the number of citations does not follow a linear rate in the course of time;
- the value of scientific work is not always acknowledged by contemporaries;
- available databases are subject to some bias toward English language publications;
- papers represent only one output of laboratory-based activity. Scientific results related to information and software are not published to the same degree.

Further possibilities and limitations of bibliometrics as science and technology indicators are discussed in the paper on bibliometrics published by OECD *Bibliometric Indicators and Analysis of Research Systems: Methods and Examples, STI working papers 1997/1 (OECD, 1997)*. This document presents also an overview on other bibliometrics databases not used for this report.

Indicators on bibliometrics

The indicators used in this volume as well as the way of their presentation conforms as much as possible with those in the previous edition (European Commission, 1994). Nevertheless, attempts were made to keep this edition self-contained and to make the presentations understandable without direct references to the first edition. In some cases the careful reader may observe some notable departures from the first edition either in the form of presentation or even in the numerical values of the indicators themselves. In all such cases the intention was to improve the form and matter. Some of the most significant differences are as follows.

- The so-called full-counting scheme was used in counting publications of countries and/or regions, i.e., a full count was recorded whenever a corporate address from a country occurred in the by-line of the publication. The same scheme has been applied to country groups, too. Double-counting has thus been avoided.
- Assignment of journals to fields/sub-fields of science (that form the basis of subject classification of publications) attempts to conform as much as possible to the definition of subject areas used in other parts of the Report.

- Some more sophisticated indicators of citation impact were introduced substituting and complementing the former *Scientific impact* indicator of the first issue, and taking into account recent methodological developments in the state of the art, while trying to make them more understandable to the layman.

Data sources

All data used to construct bibliometric indicators are taken from the bibliometric data files built by the Research Association for Science Communication and Information e.V. (RASCI, Berlin, Germany) and the Information Science and Scientometrics Research Unit (ISSRU, Budapest, Hungary). These data files are based on bibliographic data extracted from the Source, Address and Citation files of the 1980-1995 annual cumulations of the *Science Citation Index (SCI)* database of the Institute for Scientific Information (ISI, Philadelphia, PA, USA).

The databases of this institute should be mentioned in this context. The *Science Citation Index (SCI)* has become the most generally accepted basic source for bibliometric analysis. It is a database established according to precise criteria. Its unique features are basic requirements of bibliometric technology. Among these features should be mentioned:

- *Multi-disciplinarity*. All research fields in the life sciences, hard sciences, mathematics and engineering are represented.
- *Selectivity*. Periodicals covered by SCI are chosen on the basis of quantitative criteria (impact measurements), and the selection is generally reinforced by expert opinion.
- *Full coverage*. All papers published in periodicals covered by the SCI are recorded.
- *Completeness of addresses*. The addresses of all authors are indicated, allowing analyses of scientific collaboration and the application of full publication counting schemes.
- *Bibliographical references*. Together with each document their references are processed. Redefining references as sources makes it possible to analyse citation patterns and to construct citation indicators.
- *Availability*. The SCI is available in printed form, on magnetic tapes, on-line and as a CD-ROM.

Undeniably, there are several problems with the journal coverage and the data processing policies of the ISI used in preparing the SCI. Some of these problems were dealt with in great detail in the first edition of the European Report on Science and Technology Indicators (see especially pp 33 and seq.) with the conclusion: "it appears nevertheless reasonable to assume that the SCI database provides a fair insight into the internationally disseminated output of scientific communities across the world"... "Overall therefore, and bearing in mind the various limitations mentioned above, indicators based on the SCI data base are likely to provide a relatively well balanced, macro indication of the international performance of a country's scientific community."

Data processing

The fundamental principles underlying the construction of indicators and the methodology of data processing are adopted from ISSRU's experience. Software for the cleaning-up and the processing of bibliographic/bibliometric data has been developed by RASCI.

Only papers recorded in the 1980-1995 volumes of the SCI as article, letter, note or review were taken into consideration. The papers were assigned to the 50 selected countries based on the corporate address given in the by-line of the publication. All countries indicated in the address field were taken into account. The so-called full counting scheme was used, i.e., a full count was recorded whenever a country occurred in the corporate address field. Because of the extensive presence of international co-authorship, national bibliometric indicators such as publication or citation counts based on this full-counting scheme are not additive, that is, they can not be summed up over countries to regions or supra-national units. The same counting scheme was, therefore, applied again on the level of geopolitical regions and economic integration areas (EUR 15, NAFTA, EIT, DAEs, ALAI, EFTA, ASEAN), that is, at each level of aggregation one paper is assigned to one country or region, respectively, only once. Citation counts are determined on the basis of an item-by-item procedure using optimally designed publication-identifier-strings.

Subject classification of publications was based on the field and sub-field assignment of journals (in which the publications in question appeared) according to a modified version of ISI's Subject Classification Scheme. Indicators were constructed both on the level of national totals and in 8 major (or standard) fields (Clinical medicine, Biomedical Research, Biology, Chemistry, Physics, Mathematics, Engineering, Earth and Space Sciences) which are subdivided into 30 sub-fields including the advanced technology sectors: pharmacology, chemical engineering, chemistry, nuclear physics, non-nuclear physics, material science, mechanical engineering, instruments, electronic engineering.

An overview of the science fields and sub-fields used in the bibliometric analysis is given in table M.A.4.

Table M.A.4: Science fields and sub-fields used in the bibliometric analysis

1. Clinical Medicine	5. Physics
1.1 Public Health	5.1 Nuclear Sciences
1.2 Neurosciences	5.2 Applied Physics
1.3 Reproduction Medicine & Geriatrics	5.3 Solid State Physics
1.4 General Medicine	5.4 Other Physics
1.5 Internal Medicine	5.5 Instruments
2. Biomedical Research	6. Mathematics
2.1 Pharmacology & Pharmacy	6.1 Mathematics
2.2 Pathology	
2.3 Research Medicine	7. Engineering
2.4 Immunology	7.1 Materials Science
	7.2 Electronic Engineering
3. Biology	7.3 Mechanical, Civil & Other Engineering
3.1 Food Science & Agriculture	7.4 Biotechnology
3.2 Ecology	7.5 Informatics
3.3 Microbiology	7.6 Computer Science
3.4 General Biology	
4. Chemistry	8. Earth and space sciences
4.1 Inorganic Chemistry & Engineering	8.1 Geosciences
4.2 Analytical Chemistry	
4.3 Physical Chemistry	
4.4 Organic Chemistry	

Source: RASCI

Second European Report on S&T Indicators, 1997

Annual publication output data are counted for the full 1980-1995 period. Citation data are processed for the same period, but for each source year a three-year citation period (“citation window”) is used: the source year plus two subsequent years. The choice of this “citation window” is based on both long experience and methodological studies on ageing of scientific literature (e.g., Glänzel and Schoepflin, 1995) according to which, at least at the meso and macro level, a three-year citation period provides a reliable base for the calculation of citation rates and reference standards for so-called relative citation. As a consequence of this procedure, citation based indicators only for papers published up to 1993 could be determined.

Definition and description of indicators

Publication based indicators

Publication counts indicate the number of publications in which the given country or a country of the given region occurred at least once in the corporate address field (full-counting scheme, see above). Publication types other than article, letter, note and review were omitted. National and regional publication output will be determined for:

- all science fields combined;
- 8 major fields;
- 30 sub-fields.

At all levels of aggregation, annual publication counts for the period 1980-1995 were determined.

Relative Specialisation Index (RSI).

The Relative Specialisation Index indicates whether a country (or region) has a relatively higher or lower share in world publications in a particular field of science than its overall share in world total publications. *RSI* is closely related to the so-called *Activity Index* (AI) long used in bibliometrics (Frame, 1977, see also Schubert and al., 1989), which, in turn, is a version of the economists’ Comparative Advantage Index.

The definition of the Activity Index is:

$$AI = \frac{\text{the world share of the given country (region) in publications in the given field}}{\text{the overall world share of the given country (region) in publications}}$$

or, equivalently,

$$AI = \frac{\text{the share of the given field in the publication of the given country (region)}}{\text{the share of the given field in the world total of publications}}$$

The Relative Specialisation Index is then defined as: $RSI = \frac{AI - 1}{AI + 1}$

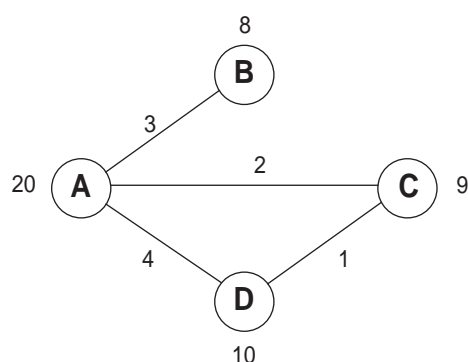
It is easy to see that *RSI* may take values in the range [-1,1]. *RSI* = -1 indicates a completely inactive research field, *RSI* = 1 if only the given field is active. *RSI* < 0 indicates a lower-than-average, *RSI* > 0 a higher-than-average activity; *RSI* = 0 reflects a completely balanced, “average” situation.

It is important to note that *RSI* reflects a certain internal balance among the fields in the given country (region), that is, positive *RSI* values must always be balanced by negative ones: in no country (or region) can all *RSI* values be positive (or negative).

International collaboration measured by international co-authorship

In the *co-authorship analyses*, binary links between countries or regions were studied. A link between two countries (regions) was established, whenever the two given countries (or members of the two given regions) co-occurred in the corporate address field of a publication. *Salton's measure* was used as a measure of international collaboration strength. *Salton's measure* is defined as *the number of joint publications* divided by *the square root of the product of the number of total publications*. The strength of co-authorship links can then be graphically presented based on *Salton's measure*. In this report the “natural topology” has been used to illustrate the structure defined by scientific co-authorship and to simplify comparisons between different sciences fields, on one hand, and different time periods, on the other (see, for instance, Braun et al., 1992).

The analysis of (international) co-authorship patterns by country pairs is the most intelligible and therefore most popular approach. As a consequence of treating collaboration links of each country pair separately, a region's value is smaller than that of almost all of the member countries. Strictly speaking this is a result of the difference between the number of *co-publications* and *co-authorship links*. In order to visualise this effect, the following figure is presented. This fictitious example describes the co-authorship links in a country group consisting of four countries (A, B, C and D). A has a publication output of 20 papers, 3 of them are jointly published with B, 4 with D and 2 with C. B has only 3 co-publications with A, etc. The share of internationally co-authored papers ranges from 33.3% (C) to 50.0% (D). The corresponding share in the region (27.0%) is, however, below all individual shares. The table also shows that due to the unique assignment of *domestic* papers to a country only this type of publications can be summed up to the total (27 papers). *International papers* (and thus all national publications) are not additive; the difference between the sum of individual publications and the factual number of papers in the group always provides information about the extent of collaboration within the group.



Country	International papers	Domestic papers	Total	Share of intern. paper
A	9	1	20	45.0
B	3	5	8	37.5
C	3	6	9	33.3
D	5	5	1	50.0
Total	1	27	37	27.0

Nevertheless, this approach makes it possible to directly compare the collaboration activity of a country or region without the necessity of studying the structure of multi-national co-authorship patterns in detail.

Identification of most active European institutions

Most active European institutions have been determined based on their occurrence in the address field of the 1992 annual cumulations of the *Science Citation Index*. Double-counting caused by intra-institutional co-authorship has been avoided by applying de-duplication procedures. Various spelling variances had to be taken into account. Errors linked to alternative names to the institutions were corrected using information from the *International Handbook of Universities* (IHU) and the *Guide to World Science* (GWS). Incomplete information on institutional affiliations, for example, only hospital or faculty affiliations are given, were manually corrected again by using detailed information from the IHU and GWS. Generally, the identification of institutions in the SCI database can be made essentially easier by means of effective search strategies. The Rheinisch-Westfälische Technische Hochschule Aachen (Germany) is used just as an example of the vast number of possible institutional spellings. 16 distinct spellings could be found in the 1992 SCI volume.

Citation based indicators

The counting of citations follows the same scheme concerning country assignment and subject classification as that of publication counts. Citations were counted in a three-year period: in the year of publication and the two subsequent years. This three-year citation window proved to be a good compromise between the relatively fast obsolescence of technology oriented literature, in most areas in life sciences, in experimental physics literature, on the one hand, and of the slowly ageing theoretical and mathematical topics in physics on the other (see Glänzel and Schoepflin, 1995). As a consequence of this procedure, citations could be counted only for papers published up to 1993.

- Citation Rate per Publication (*Mean Observed Citation Rate*). The ratio of citation count to publication count (both as defined above).
- Expected Citation Rate per Publication (*Mean Expected Citation Rate*). The expected citation rate of a single paper is defined as the average citation rate of all papers published in the same journal in the same year. (These journal averages are obviously closely related to the Journal Impact Factors, as they are defined and listed in the Journal Citation Report volumes of the SCI (Garfield, 1975). Instead of one year citation window to publications of the two preceding years as used in the *Journal Citation Report* (JCR), a three-year citation window to one source year is applied in the present report, as explained above. For a set of papers assigned to a given country (region) in a given field (sub-field) the indicator is the average of the individual expected citation rates over the whole set.
- *Relative Citation Impact Index* (RCII). RCII measures whether the publications of a country (region) attract more or less citations than expected on the basis of the average citation rates of the journals in which they appeared. Since the citation rates of the papers are gauged against the standards set by the specific journals, it is largely insensitive to the big differences between the citation practices of the different science fields and sub-fields. Therefore, this indicator is uniquely suitable for cross-field comparisons.

RCII is closely related to the so-called Relative Citation Rate (RCR) long used in bibliometrics (see, for instance, Schubert and al., 1989). RCR is defined as the ratio of the Citation Rate per Publication to the Expected Citation Rate per Publication, that is, $RCR = MOCR/MECR$. Similarly to the way *RSI* was derived from *AI*, *RCR* can be normalised into the range [-1,1] by the transformation

$$RCII = \frac{RCR - 1}{RCR + 1}$$

$RCII = -1$ corresponds to no citations, $RCII = 1$ to the fictitious case of an infinite number of citations; $RCII < 0$ means lower-than-average, $RCII > 0$ higher-than-average citation rate, $RCII = 0$ if the set of papers in question attracts just the number of citations expected on the basis of the average citation rate of the publishing journals.

A.6 Patent Indicators

Characteristics and limitations

Patents are a means of protecting inventions, developed by enterprises, institutions or individuals, in order to reap the market benefits which stem from the invention or innovation. They are just one of a number of methods of securing intellectual property rights (IPR), others being, for example, trademarks, industrial designs, and copyrights. Patenting gives an invention a legal status and provides protection from unlicensed copying. Within companies, patenting may sometimes serve more strategic aims, for example by lending greater status and credibility to inventions and thus helping to attract further internal or external funding. At the same time, patenting leads to the publication of the technical details of the invention. Patent data are therefore publicly available, cover a wide range of technologies, and usually extend over a long time period. In being so closely linked to in-

vention, and so easily accessible, data on patent applications are often considered as an extremely useful proxy for technological output.

However, patent based indicators have a number of limitations:

- The propensity to patent varies across enterprises, industry sectors and countries.
- For certain firms in particular sectors, there may be other more effective means of appropriating the market benefits of their inventions, such as secrecy, rapid launching or low prices.
- Not all inventions can be patented, for example computer software.
- The requirement of novelty for the granting of patents means that certain more incremental technological innovations will not be covered (which is important for all countries, but particularly so for less developed countries, whose technological activity may not be adequately portrayed by patents).
- For a complex invention, the number of patent applications which need to be filed may vary from one patent office to another.
- Each patent system – either national systems such as the US Patent and Trademark Office (USPTO) or regional systems such as the European Patent Office (EPO) – provides protection for a specific geographic area. Therefore, export and market strategies will strongly influence the specific patent office(s) at which a patent application is filed. Consequently, for each geographic area, there is always a bias towards domestic applications.

This last phenomenon - often referred to as “home advantage” - deserves some further elaboration. For the US inventor, a USPTO patent is a ‘domestic patent’, and in many cases this may refer ‘low technology’ areas where patent protection is only sought for the US market. Consequently, the USA’s share of USPTO patents will be high, and the proportion of these patents in high-tech sectors - those considered in this Report - will be relatively low. Symmetrically, US patents taken out at the EPO characterise the technological positions taken by US inventors to develop their exports in Europe. Conversely, for the European countries, there will be a home advantage in their EPO patenting, while their patents at the USPTO will be related to their export strategy in the USA. For countries other than the United States and the European countries, both USPTO and EPO refer to export strategies. This is all the more important to bear in mind, because the eight sectors considered in this report do not include ‘low tech’ sectors, which will be large for the US in USPTO data and for European countries in EPO data.

For further information on patent information and its use in constructing science and technology indicators, see OECD (1994): *Using patent data as science and technology indicators - patent manual*.

Data sources used

The patent indicators used in the Report have been calculated using data extracted from two databases. The first is the database of the USPTO, which covers patents that are valid on US territory. The second is the EPO database, relating to the patents of the ‘European patent system’ which are filed under a regional application procedure, and provide protection in the countries that have signed the European Patent Convention, or a selected subset of these countries.

USPTO data

The USPTO data refer only to patents that are granted since, in the US system, only granted patents are published.

It is also important to note the difference between the priority date (i.e. the date of first application) and the date of publication, which may be between 1.5 and 4 years after the priority date. Moreover, while the priority year for US inventions coincides with the year of application, for non-US inventors it precedes (external) US application by up to one year. Consequently, the data relating to the priority years after 1991 are not complete, since some patents filed during this period are still pending, and as a result the data by priority year for 1992 to 1994 have been estimated. However, the data by publication year are available and complete up to 1995.

For more details of the differences between priority year and publication year, and of the dating conventions used throughout the Report, see the box on this subject in Chapter 2 section b.

EPO Data

The EPO data refer to patent applications, not patents granted as for the USPTO. All EPO patent applications are published 18 months after the first application, whether subsequently granted or not. An analysis of the proportion of European patents applied for versus those granted is the subject of a box in Chapter 2 section b.

As for USPTO data, EPO patent statistics can be presented by priority year or by publication year. The data by publication year go up to the end of 1995. Given the 18 month gap between first filing and publication mentioned above, the EPO statistics by priority dates are complete until mid-1994. Therefore the 1994 priority year data are estimates of the whole year from its six first

months. It should also be noticed that the EPO data also include the so-called EURO-PCT applications, i.e. those patent applications that designate European countries in an international application (under the Patent Co-operation Treaty - PCT). Such applications are also published 18 months after priority date.

Allocation of patents to sectors

In order to analyse patenting activity at the level of individual sectors, it was necessary to relate patents to specific industries. This can be done using certain coded information contained in the patent itself.

In the case of EPO patents, the allocation to sectors was performed by linking the International Patent Classification (IPC) code on each patent to one or several sectoral ISIC codes, using a concordance scheme developed by MERIT (see Verspagen *et al.* (1994)). The concordance is between ISIC rev. 2 and the fifth edition of IPC (1989). The assignment of 4-digit IPC-classes to one of 22 ISIC sectors (2-4 digit) was done on the basis of the technical description of the IPC class and the ISIC class. Thus, a patent in computer technology would be placed in 'computers and office machinery'. The firm that applies for the patent does not enter the considerations (and thus a patent on computer technology applied for by an electronics firm will also be classified into 'computers and office machinery'). The MERIT concordance was carried out by economists. Technical experts in relevant fields were consulted to check the concordance ex-post, as well as in cases where the decisions were difficult. In many cases, a 4-digit IPC class could not be assigned to a single ISIC class. In this case, weights (summing to 100%) were introduced which assign one IPC to multiple ISIC classes, although there is some degree of arbitrariness in setting up these weights.

For USPTO patents, the procedure used was more straightforward. Sectoral (US SIC) codes, which are recorded on US patents, were used directly to allocate patents to each of the eight sectors used in the Report, see table M.A.5.

Table M.A.5: Definitions of 8 most R&D intensive industry sectors in terms of US SIC

aerospace	SIC 372
computers & office machinery	SIC 357
electronics	SIC 365, 366, 367
instruments	SIC 38
pharmaceuticals	SIC 283
chemicals	SIC 281, 282, 284, 285, 286, 287, 289
electrical machinery	SIC 361, 362, 364, 369
motor vehicles	SIC 371

Source: FhG-ISI

Second European Report on S&T Indicators, 1997

Regional patent indicators

For comparisons between EU regions, Eurostat's database on regional patent applications was used. This is a special extraction from the database of the European Patent Office (EPO), and contains information on European patent applications with at least one inventor resident in EU 15. The criteria used for establishing the database were chosen with a view to measuring the regional potential for innovation, following the ideas outlined in "*The Regional Dimension of R&D and Innovation Statistics – Regional Manual*" (Eurostat 1996, pp 164-178). These criteria are not the same as those used to extract the EPO data at industry and country level. Hence national totals calculated by summing the regions may differ from the corresponding country level data presented elsewhere.

The regional patent data refer to applications filed directly under the European Patent Convention or to applications filed under the Patent Convention Treaty and designating the EPO (EURO-PCT). Applications are counted according to the date of filing. Filings are indicated yearly from 1989 to 1995 (1995 data are provisional).

The regional distribution is assigned according to the address of the inventor. If an application has more than one inventor, the application is divided equally among the inventors and therefore subsequently among the regions. Shares of applications assigned to inventors with an address outside EU 15 are disregarded.

The applications are classified according to the International Patent Classification (IPC) which indicates the field of technology. One application is usually assigned to more than one IPC code. The most detailed reference class for the data is at sub-class

level. If more than one sub-class is mentioned, the application is divided equally between all indicated sub-classes. For further information see “*R&D: Annual Statistics 1997, Eurostat 1997*”.

Definition and analysis of key technologies

The analysis of patents according to “key technologies” is based on the approach used in a study by the French Ministry of Industry (“*Les 100 technologies-clés pour l’industrie française à l’horizon 2000*”, DGSI-Ministère de l’industrie, Paris, July 1995). The study identified 100 so-called ‘key technologies’, of which 88 involved patent numbers large enough to allow statistical analysis (the threshold was put at 50 patents in total since 1985).

The same key technology definitions have been used to analyse EPO patents in sections 2b and 3b of this report. The indicators calculated are of two kinds:

- indicators of key technology areas: the 88 technologies have been clustered in 10 key technology areas: Electric and electronic components (EC), Audiovisual-Telecommunications (AT), Computers (C), Instruments-Optics (IO), Pharmaceuticals-Drugs (PD), Biotechnologies (B), Materials (M), Industrial processes (IP), Environment processes (EP), Transport (T). The share of a country in such an area is the arithmetic mean of its shares in each of the technologies belonging to the area,
- indicators of individual key technologies: for 24 individual key technologies falling within the 10 key technology areas, shares per country are also calculated (see box below).

List of 24 individual key technologies

- 1 Batteries for portable electronic equipment (EC)
- 2 Conception and fabrication of low consumption components (EC)
- 3 Electric vehicles (EC)
- 4 Flat screens (AT)
- 5 Broad band transmission and commutation (AT)
- 6 Technologies for the management of ‘intelligent’ networks (AT)
- 7 Technologies for optic cables and fibres (IO)
- 8 Robotics for hostile environments (IO)
- 9 Medical imaging (IO)
- 10 Vaccines from genetic engineering (PD)
- 11 Recombinant drugs (PD)
- 12 Monoclonal antibodies (PD)
- 13 DNA sequencing (B)
- 14 Genetic modification of plants (B)
- 15 Production of recombinant proteins (B)
- 16 Aluminium and magnesium structures (for cars) (M)
- 17 Piezo-electric, ferroelectric and magnetic polymers (M)
- 18 Membrane separation technologies (M)
- 19 Polymer recycling (IP)
- 20 New materials with organic matrix (IP)
- 21 Biological water treatment and sludge treatment (EP)
- 22 Technologies for water treatment and drinking-water quality control (EP)
- 23 Technologies for urban waste treatment (EP)
- 24 Improvement of the recyclability of cars (T)

A.7 External Trade in High-tech Products

The share of high-technology products in the total trade flows of a given country is an important indicator for its competitiveness. Unfortunately, there is no unambiguous way to define the “high-tech” content of a product or product group. Several concepts have been proposed. They refer for example to the input to, market share or value of high-tech products. They have in common, that a cut-off point has to be set to distinguish high-tech from the other products. But already the selection of “the” appropriate criterion is subject to a certain amount of arbitrariness as well as the decision over a cut-off point.

Furthermore, high-tech trade can be examined on the basis of sectoral data or data on products. The sectoral data (for example from the OECD STAN database) allow the construction of four industry groupings based on R&D intensity: a high-technology grouping (comprising aerospace, computers, electronics, pharmaceuticals), as well as medium-high, medium-low and low-technology groupings. Such data also make it easy to combine R&D with trade and industrial data for analyses. Industrial data however have three main limitations. First, the lack of sufficiently disaggregated data (only four sectors are classified in high-tech), Second, many of the products manufactured by some sectors in fact correspond to the activity of other sectors, given that all the research and products are attributed to the principal activity of the firms which make up the sector. Finally, many of the products manufactured by the high-tech sectors are medium or even low-tech, while, conversely some of the products made by the medium or low technology sectors are high tech.

It was to overcome these difficulties, that the approach by product was developed. The OECD in co-operation with Eurostat recently (in November 1995) developed a more detailed list by product (see OECD document DSTI/EAS/IND/STP(95)1 for further detail). In the first stage a new list by product was prepared as the outcome of calculations concerning R&D intensity by groups of products (R&D expenditure/total sales) corresponding to the third revision of the Standard Industrial Trade Classification (SITC Rev. 3), for the purposes of which six countries were taken into consideration (United States, Japan, Germany, Italy, Sweden and the Netherlands). In the second stage, the content of these product groups was analysed at a more disaggregated level of digit 4 and digit 5. At this level of aggregation many products could not justifiably be considered high tech and had subsequently to be excluded. This leads to an underestimation of the respective trade flows in high-tech products. However, the degree of this underestimation is not known. Therefore the results have to be reviewed carefully. Where doubts remained, experts in the products concerned were consulted.

A main choice for the final list was the treatment of the automobile industry. In the sectoral approach, this industry is considered to be medium-high tech and it would be difficult to justify different global treatment for motor vehicles depending on whether the sectoral approach or the approach by product was adopted. For this reason, it was decided that it was preferable to exclude motor vehicles from the list of high tech products.

Furthermore, the third revision of the SITC is only in use since the year 1988. To extract the corresponding data for the period 1980 to 1987, the high-tech product list had to be expressed in the terms of SITC Rev.2. Unfortunately, not in all cases an unambiguous conversion was possible. Therefore the data for the years since 1988 are not strictly comparable with the results gained for the previous period of time.

Table M.A.6: High Technology Products List - SITC Revision 3

Aerospace	7921 + 7922 + 7923 + 7924 + 7925 + 79291 + 79293 + (714 - 71489 - 71499) + 87411
Computers & Office Machinery	75113 + 75131 + 75132 + 75134 + (752 - 7529) + 75997
Electronics	76381 + 76383 + (764 - 76493 - 76499) + 7722 + 77261 + 77318 + 77625 + 77627 + 7763 + 7764 + 7768 + 89879
Instruments	774 + 8711 + 8713 + 8714 + 8719 + 87211 + (874 - 87411 - 8742) + 88111 + 88121 + 88411 + 88419 + 89961 + 89963 + 89966 + 89967
Pharmaceuticals	5413 + 5415 + 5416 + 5421 + 5422
Electrical Machinery	77862 + 77863 + 77864 + 77865 + 7787 + 77884
Chemicals	52222 + 52223 + 52229 + 52269 + 525 + 531 + 57433 + 591
Non-electrical Machinery	71489 + 71499 + 71871 + 71877 + 71878 + 72847 + 7311 + 73131 + 73135 + 73142 + 73144 + 73151 + 73153 + 73161 + 73161 + 73163 + 73165 + 73312 + 73314 + 73316 + 7359 + 73733 + 73735
Armament	891

Source: OECD - Classification of High-Technology Products and Industries

Second European Report on S&T Indicators, 1997

A.8 Technology Balance of Payments

The Technological Balance of Payments (TBP) records the flow of funds for transactions concerning industrial property rights. It covers invisible transaction in a country's balance of payments concerning the purchase and sale of "disembodied" technology in the form of intellectual and industrial property rights including patents, licenses, know-how and technical assistance. It is therefore an indicator of technology transfer across countries.

The main features of the indicator are the following:

- the TBP offers a partial view of the general phenomenon of world technology transfer and may thus be used as an indicator of the diffusion of technology or competitiveness, possibly together with other indicators including, for instance, data on foreign trade and direct investment;
- the range covered by the technological balances of the various countries is not uniform: in addition to the flow of funds relating to technological transfer in the strict sense of the term (patents, manufacture licences, technical know-how), in some case they also include technical services (technical assistance, staff training, consultancy services), while in other cases they may even cover payments for intellectual and industrial property rights not directly connected with technology (management services, film rights, etc.);
- international comparability of the TBP indicator is also limited by the different survey procedures (direct survey through agent banks or indirect ad hoc survey, sample survey or census);
- by its very nature, "disembodied" technology, which can be exchanged without financial transactions, gives rise to problems of interpretation; it may occur in the context of cross-licensing agreements, with transfer of know-how to a foreign subsidiary, or in the field of non-commercial international co-operation;
- trends in transactions included in TBP are significantly conditioned by the multinationals which, according to the available data, are responsible for about two thirds of the total value of transactions recorded in the technological balance of payments (in the case of the United States these in-company transactions account for 80% of the TBP receipts).

In 1982 the OECD began the systematic collection and publication of member countries' TBP data, and a series of seminars and conferences on the subject led to the adoption of the OECD *Proposed Standard Method of compiling and interpreting technology balance of payments data - TBP Manual* (OECD, 1990) and to later methodological development in the area.

Here shall be listed the operations suggested by the OECD experts for inclusion in member countries' TBP: patents (purchase, sale, licences), know-how (non-patented), trade-marks (including franchising), technical assistance, R&D financed abroad. The manual recommends the omission of the following operations: commercial, financial, managerial and legal assistance, advertising, insurance, transport, films, recordings, materials covered by copyright, design, software.

European market liberalisation appears to have had a significant effect on TBP statistics in the 1990s, since the public administrations are now obtaining technology transfer data from operators on the basis of the intrinsic merit and usefulness of the statistics rather than merely applying an administrative act. The abolition of currency controls by many countries has given operators greater freedom in their currency transactions overseas. Residents enjoy the right to open bank accounts in foreign currency in their own and other countries, are no longer obliged to convert currency purchased abroad and may acquire foreign currency whenever they like without having to prove that it serves for the payment of imports. In other words, possession and conversion of foreign currency are no longer tied to or limited by specific trading transactions. This has modified the role played by banks as authorised intermediaries, and thus the function of notifying the central bank on currency operations between resident and overseas operator. Data gathering on TBP in European countries is now carried out through statistical surveys: therefore a break in series has occurred since the beginning of the 1990's. A major problem at present is the linking of old and new series which are based on different statistical populations and data gathering procedures.

A.9 Innovation

The ranking of sub-questions according to their perceived importance

Tables A.9.2-A.9.4 contain rankings derived from answers to sub-questions in the first Community Innovation Survey. The methodology used to calculate these rankings is described below.

Let Q be a question that is divided in, say, 4 sub-questions.

Let Q_i be the vector of answers to Q. The elements of the vector are the answers to the sub question (Q_{ij} = answer of enterprise i to the sub-question j).

For each enterprise, these elements are ranked according to their values. Rank 1 is assigned to the element that has the smallest number, rank 2 to the next largest, and so on up to rank n , n being the number of elements that have non missing values. Two elements that have the same value are called “tied elements”, which are given “average ranks”.

Below are some examples of how those ranks are computed. Let Q_i be the vector of answers of an enterprise. Suppose that each element of the vector consists of a question to which people can respond by an integer ranging from 1 (not important) to 5 (important). Here are some possible answers. Ranks have been attached to those answers.

	Q_{11}	Q_{12}	Q_{13}	Q_{14}
answer	1	5	3	4
ranks	1	4	2	3
	Q_{21}	Q_{22}	Q_{23}	Q_{24}
answer	1	2	3	3
ranks	1	2	3.5	3.5
	Q_{31}	Q_{32}	Q_{33}	Q_{34}
answer	1	1	1	1
ranks	2.5	2.5	2.5	2.5
	Q_{41}	Q_{42}	Q_{43}	Q_{44}
answer	1	2	3	.
ranks	1	2	3	.

High ranks are given to questions that were considered by the enterprise as being the most important. Suppose that an enterprise has answered “3” maximum. The highest ranks will be given to the answers with 3 as answer.

By summing the ranks over i , an idea develops of which questions are considered as being the most important for the enterprises. These sums are called: “total score of the question”.

For the example:

	Q_1	Q_2	Q_3	Q_4
Total score	5.5	10.5	11	9

To improve readability, the questions are ranked according to their total score. The question with the smallest score will correspond to the question that is considered as being the most important.

This leads to the following ranking for the example:

	Q_1	Q_2	Q_3	Q_4
Total score	4	2	1	3

A.10 R&D Co-operation in Europe

International research collaboration

Given the scarcity of the information necessary for chapters 10, 12, 13, 14 and 15 and the disparate sources from which it could be obtained, it was decided to undertake a survey. This involved a number of primary questionnaires and direct interview surveys of:

1. European Scientific Facilities and Organisations (ESFOs) in Europe;
2. International Fellowships Survey; and
3. Survey of International Inter-Governmental Scientific and Technological Agreements

To provide additional verification of the data collected via the primary surveys, secondary data sources were used to check the quality and consistency of the information supplied and to provide additional material for the review and analysis. A brief outline of each of the surveys is provided below and, where applicable, a short description of the methodologies used in the analysis.

European Scientific Facilities and Organisations (ESFOs)

In terms of the ESFOs survey, a 'population list' of organisations and facilities was constructed for the survey. These organisations and facilities were broadly defined to encompass those bodies, with varying organisational status (see Table 10.3) that sought, in some way, to facilitate communication and joint research between European scientists (i.e. that involved researchers and scientists from more than one country) and to help support the sharing of costs and expertise on research themes of mutual interest. This included organisations that were essentially based around physical facilities, notably large-scale research units, and those organisations that had no physical laboratories or facilities, but which instead sought to establish a network or association of European scientists concerned with a topic or field of mutual scientific interest.

On the basis of the above definition, 12 such ESFOs were identified and a postal questionnaire was sent out to these organisations. 9 useable replies were returned and these organisations were used as the basis of the survey information (see, for example, Table 10.5 for their listing). The information collected included information on the characteristics of their research and scientific programmes, the overall size of their budget, their R&D expenditure, the number of staff involved and the number and nature of involvement by national governments (see, for example, Tables 10.3, 10.4, 10.5 and 10.6). In turn, officials from these 9 ESFOs (except EISCAT) and 3 related organisations were interviewed to gain additional background information on the nature and role of these organisations and their pattern of international collaboration. More details of the survey should refer to the working paper by Howells, McKinlay and Barker (1997).

International fellowship survey

The International Fellowship Survey is based on 94 major international fellowship schemes run by scientific and technical institutes and agencies across Europe and selected countries across the world. A target 'population list' of all international fellowship awarding organisations in the European Union and the rest of Europe, the USA, Japan and other developed countries was compiled. International fellowship schemes that were included in the survey population list covered those schemes where an employee from one organisation is funded (by either another organisation or the same organisation that employs that person) under a specific institutional arrangement, to undertake scientific research or related technical and educational work at another organisation located in another sovereign country. Most international research fellowship schemes were highly specific concerning what type (age, qualifications and so on) of people are qualified to be supported under such schemes and in what host organisation and what country(ies) they could work in. The survey sought to exclude those schemes involved in purely training, although some schemes with a research and training component were included. In total 107 research fellowship organisations were contacted, of which 31 replied (a response rate of 28.97%) who were responsible for 94 international research fellowship schemes. In terms of the 31 organisations responding to the survey, they came from the following countries:

Denmark (2), Germany (4), Spain (1), France (2), Ireland (1), Austria (1), Sweden (5), UK (6), Canada (1), USA (1), Japan (1), International Agencies (5), European Commission (1).

It should be noted, that although the study seeks to be as comprehensive as possible, the survey remains partial and focuses on the European Union; in this sense, by its nature and remit, the survey is 'Euro-centric' but it does seek to include other fellowship schemes run by major scientific and technical institutes and agencies across the world, such as those run by NATO and Fulbright. Moreover, the study is intended to be the first of a number of surveys of fellowship schemes and therefore represents in some ways a trialing or piloting of some of the questions and methods used in the analysis. The data were then analysed through multidimensional scaling using an SPSS-X™ package. For more specific details about multidimensional scaling, readers should refer to the texts by Schiffman and Reynolds (1981) and Kruskal and Wish (1978).

In the figures in chapter 12, the distance separating two countries is dependent on the intensity of co-operation between those countries (the closer together the more interaction), whilst the position of that country overall within the diagram indicates the 'centrality' of that country in terms of its overall network connectivity with the other countries shown. In turn, the arrowheads in the said figures indicate the direction of flow of research personnel, because not in all cases were there reciprocal schemes and therefore reverse flows of personnel did not take place (see Howells, McKinlay, Hinder, and Nedeva (1997)).

Survey of International Inter-Governmental Scientific and Technological Agreements

In the context of the survey of inter-governmental scientific and technological agreements, this was undertaken via a postal questionnaire survey or via direct interview with the relevant governments of EU Member States, European Commission and major trading partners, such as the United States, Japan and Canada. Again although care was taken for the survey to be as comprehensive and accurate as possible, there was a number of non-responses and cases where only one country to a bi-lateral agreement had the agreement noted on their official records.

There were also additional problems in defining the boundaries of governmental international scientific and technological agreements. Thus, for example, some agreements were between ‘national’ and ‘regional’ governments (as between Italy and Quebec), whilst other scientific and technological agreements were part of much wider economic and social agreements. Moreover scientific and technological agreements varied greatly in terms of their stated and real intent. Thus some had specific budget lines supporting the collaboration they outlined in the formal agreement document. Some others had no specific budget line, but had provided an impetus for many bilateral agreements to take place; whilst others seemed to have instigated no actual collaboration at all.

Further work needs to be undertaken to define, classify and refine what multilateral and bilateral international science and technological agreements between governments more specifically represent and how they may shape future research and technical ties between the countries involved. As noted in Chapter 12, international bilateral scientific and technological agreements can be best seen as providing an overarching framework between two or more sovereign countries and a statement of intent for further science and technological collaboration between parties within the countries in question.

Inter-enterprise alliances

Databases used

Three main databases were used in the preparation of indicators on inter-enterprise alliances (see Chapter 11):

- the INSEAD database on strategic alliances,
- the MERIT/CATI database on co-operative agreements and technology indicators,
- the IFR/Securities Data Company joint ventures and strategic alliances database.

Some use was also made of a fourth database - the M & A Asia database on joint ventures in Asia - which, although not directly cited, was used to confirm and provide supporting evidence for some of the analysis in the text.

All the databases were assembled by their authors in much the same way - that is by combing through books, articles, journals and newspapers for details of alliances and joint ventures. To this basic methodology may be added direct information from companies or other sources such as information provided by investment banks or corporate advisers. The strengths and weaknesses of this approach have often been commented upon. There is usually under-reporting of deals from smaller and less developed economies, and often better coverage of the activities of larger companies as opposed to smaller ones. An additional problem is the probably spurious “growth” in the number of deals recorded over time due to increasing newspaper and academic interest in the subject. In other words, rather like crime statistics, more events have been recorded in recent years, but the underlying reality may not be changing quite as fast as the figures suggest.

Thus, unlike the statistical material used in some other chapters of this Report, the alliance data are “softer” and may contain hidden biases. To counteract this, extensive use has been made of more qualitative information sources to qualify any conclusions that may have been drawn. In particular, a programme of selective interviewing was undertaken with a number of experts, academics, industry observers, and practitioners from individual companies, who between them have considerable knowledge and experience of technology-based alliances. This qualitative input, particularly as regards the analysis of trends in industry sectors, has been extensively used to complement the purely statistical evidence.

For the reasons outlined above, none of these databases pretends to be a fully comprehensive account of all the alliances or joint ventures entered into by companies. Indeed, it would appear that no such comprehensive or complete database exists. Consequently, and in an attempt to provide the best collection of this type of information currently available, the approach in this report has been to exploit the three databases in a complementary fashion, using each one for the analyses to which it is best suited:

1. The INSEAD database focuses on the more important “strategic” alliances - deals which are longer term and aimed at improving the partners’ competitive positions. About one third of these deals relate to technology, while the others include alliances which involve marketing and production. The INSEAD database was therefore used to look at longer term trends and the relationship between TBAs and other kinds of alliances.
2. MERIT/CATI is a relational database focusing exclusively on technology co-operation. Smaller “non-strategic” deals are included too. This database has been used to “get inside” the specific technologies (e.g. biotechnology, risc technology, etc.) used in different industrial sectors.
3. The IFR/SDC database contains over 9000 alliances where there is a very strong and clear research, development and technology agenda. Because it is the most comprehensive and geographically broad-based dataset, it has been used extensively to look at country, bloc and industry sectors.

In each table and figure it is clearly indicated which database has been used.

Counting alliances

Counting alliances is quite complicated. The reason for this is that one alliance automatically has two or more partners, who may be from the same or different industries or the same or different countries and economic blocs. In this report, three methods have been used for counting alliances.

(1) Pure Alliance Count (PAC)

Where one needs to know, quite straightforwardly, how many alliances there were in a particular time period or inside a particular area, alliances are simply counted irrespective of partner, country, or sector relationships. In this case, each separate alliance (or agreement) is counted once only, irrespective of how many different companies take part. Thus an alliance between, say BP and Mobil to sell gasoline is “one” alliance, as is an alliance between 40 separate computer companies to create an industry standard for intranet communications. In the Pure Alliance Count, both these examples would score as one, and only one, alliance.

(2) Alliance Representation (AR)

Unfortunately, there are many occasions when the PAC is not a useful measure. For example, supposing one wants to know how many companies took part in a given number of alliances as measured by PAC? The number of companies must be at least twice the PAC because each individual alliance must have at least two participants (by definition). In fact, many alliances (around 20%) have more than 2 members. So the number of companies “represented” in a given set of alliances will always be more than twice the PAC. For this reason, if one wants to know how many times a particular company, or group of companies took part in a given set of alliances, the concept of Alliance Representation must be used.

A simple arithmetic example will illustrate the idea. Suppose there are only 3 companies, A, B and C, and their alliance behaviour is as follows:

- 1) A allies with B; and
- 2) A allies with B and C.

The PAC is clearly two. However, if one asks how many alliances each company has, the answer is: A has 2, B has 2 and C has 1 - making 5 in all. However, this total, 5, is misleading for the purpose of understanding what the relationships between companies looks like. The Alliance Representation concept is needed to show these interconnections. How many times is A “represented” in alliances with other companies? The answer is:

- 1) A is represented 3 times, since it is allied once with B separately, once with B in the joint alliance, and once with C - also in the joint alliance.
- 2) B is also represented 3 times, since it is allied once with A separately, and once each with A and C in the joint alliance.
- 3) C is represented twice, since it is allied with both A and B in the joint alliance.

Alliance Representation is important when considering the linkages between companies (or between regions). The following table shows how A, B and C would be represented in a matrix of alliances:

	A	B	C
A	-	2	1
B	2	-	1
C	1	1	-

The total representation shown is 8. Remembering that the matrix is a “mirror”, the count exceeds the total number of alliances by **at least** a factor of two; in fact the PAC is 2.

(3) Partnership Distribution (PD)

In one case, Table 11c.1 “Technology Alliances between Sectors”, it was necessary to develop an additional method of counting. This is called Partnership Distribution (PD). In this instance the starting point was a Pure Alliance Count. Suppose there are 100 alliances within an industry sector - e.g. Chemicals. The next step is to count the number of companies involved in the 100 alliances. For this purpose, one ignores the “representation” and simply looks at the overall company count. So, if ICI was involved in 2 alliances and Solvay only in 1, one would still, for this analysis, count ICI once and Solvay once. Suppose that in the 100 alliances there are 20 companies. One then looks at the SIC code of each of the 20 companies. It may be that 10 only of these are actually “chemicals” companies, 5 are “pharmaceutical” companies and 5 are “instruments” companies. The PD in this example is therefore 10/5/5 or 50%/25%/25%. The implication of this analysis would be that only half of the companies involved in alliances in the chemicals industry are in fact chemical companies.

B. General Economic Indicators

B.1 Macro economic

The national accounts data used throughout the report are gross domestic product, gross national product, gross fixed capital formation and gross domestic saving.

Gross domestic product at market prices represents the final result of the production activity of resident producer units. It corresponds to the economy's total output of goods and services, less intermediate consumption, plus VAT on products and net taxes on imports excluding VAT.

Gross national product can be calculated by adding to gross domestic product at market prices the compensation of employees and the property and entrepreneurial income received from the rest of the world and by deducting the corresponding flows paid to the rest of the world.

Gross fixed capital formation consists of resident producers' acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets realised by the productive activity of producer or institutional units. Fixed assets are tangible assets produced as outputs from processes of production that are themselves used repeatedly, or continuously, in processes of production for more than one year.

Finally, gross domestic saving equals gross domestic product minus final national consumption.

The data have been drawn from many different sources, such as Eurostat, OECD, World Bank, IMF, UN and national sources. Since all sources use the results from the base questionnaire, sent to the national statistical offices, they all use the same raw data, which means that the different sources produce more or less comparable data.

B.2 Price Indices

Indices shown for consumer prices are the most frequently used indicators of inflation and reflect changes in the cost of acquiring a fixed basket of goods and services by the average consumer.

The consumer price indices given here are the national general indices which have different names in each country; they are not harmonised. The coverage of these general indices varies between countries as regards the proportion of the population covered (e.g. specific income groups or other categories may be excluded), the goods and services covered (e.g. owner occupiers' housing costs may be excluded). A system of fixed weighting is used in some countries, whereas others use a chain system updating weights each year. The sources used are Eurostat, ILO, IMF and the European Comparison Program for the Eastern European countries.

Conversion

In order to allow for inter temporal comparison of variables, time series need to be deflated to remove the effect of inflation on the comparability of the data. The price component must be eliminated, so that only the volume element remains. For this purpose the national accounts series are deflated by means of the implicit GDP price index.

The Implicit GDP Price Index

The implicit GDP price index is not a direct measurement of prices, but is derived implicitly by dividing GDP at current prices by GDP at constant prices. The price indices are implicitly chain indices of the Paasche type, expressed in index form, with the base 1990=100.

B.3 Exchange rates

Comparisons between countries can be made on the basis of the data in national currencies; for example growth rates of certain aggregates in current values, prices or volumes, shares of a given aggregate in GDP, etc. In order to compare the levels of aggregates in different countries, they have to be converted into a common unit.

Two such units are used in the report:

- (i) European currency unit (ECU) based on exchange rates;
- (ii) Purchasing power standard (PPS), the Community unit of the purchasing power parity, based on relative prices and used to make volume comparisons.

The European Currency Unit

The ECU is a "basket" monetary unit based on the market exchange rates of a certain quantity of each Community currency. The rates used here are annual averages of the daily rates. If from some source there is no ECU exchange rate, the US dollar exchange rate is used and multiplied by the Eurostat dollar-ECU exchange rate.

Need for purchasing power parities

Data converted at market exchange rates do not give a true comparison of the actual volumes of goods and services produced and used in different countries. For example GDP per head in ECU in the Federal Republic of Germany or in Denmark is considerably greater than in Italy or the United Kingdom. However, this represents not just a greater volume of goods and services consumed, but also a higher general price level. The purpose of purchasing power parities is to eliminate this difference in price level to improve the comparison of volumes.

Moreover, over time exchange rates move in response to many factors independent of domestic price movements and this further distorts the comparison. The parities can be compared with the ECU exchange rates mentioned above.

While there is only one exchange rate, price level differences between countries at any point in time are not the same for different commodities; so there is potentially a whole family of specific purchasing parities in any one year. Thus, for example, there are specific parities for consumption of food, total consumption, for gross fixed capital formation, etc. which differ slightly from the overall GDP parity. Only the specific parity for a given aggregate gives a true volume comparison. In this report however, only the parity for GDP is used. The use of only one parity has the advantage of simplicity, maintains the relative importance of sub-aggregates (such as consumption) in GDP and gives generally a closer approximation to a volume comparison than is given by the exchange rate.

Method of calculation

The basis for the calculation of purchasing power parities is data on prices of an agreed list of products. Very great attention is given to obtaining a list of products which are both representative in the countries participating and strictly comparable between countries.

Each product gives rise to price ratios such that if 1 unit of the product costs DEM 2 in Germany, FRF 4 in France and ITL 600 in Italy, then for this product DEM 2 is equivalent to FRF 4 is equivalent to ITL 600, etc. Price parities for the aggregates and for GDP are then obtained as suitably weighted averages of these price ratios.

The purchasing power standard (PPS)

Such parities would be enough to express all the data, in real terms, in the currency of one country (the method guarantees that they are transitive and independent of the base country chosen). For the Community calculations another *numéraire* is used. It is called the purchasing power standard (PPS) and is defined by applying these price ratios to the gross domestic product in national currencies of the countries and scaling the parities such that the value of GDP of the Community (EUR 15) in PPS is the same as in ECU. Contrary to the past practice, the identity "Community total in ECUs" = "Community total in PPS" used to define the numéraire will from now on be calculated for every year.

Parities for other countries

The parities used for the USA and Japan have been derived from the international dollar parities calculated by the OECD. Methodologically they are entirely consistent with the parities of the Community countries calculated by Eurostat. For all other countries the international dollar parity from the respective sources (OECD, Penn World Table) are taken and multiplied by the PPS of the USA as calculated by Eurostat.

B.4 Population

Definitions on population

In general the statistics refer to the resident population of each country. In accordance with this concept, persons normally resident in a country but temporarily absent on business, holiday, etc., are included in the total population figure, whilst foreigners temporarily resident in the country for similar reasons are excluded. Nationality is not taken into consideration when this concept is applied, and foreigners whose usual place of residence is in that country are included along with citizens of that country. Armed forces personnel and members of the diplomatic corps of that country, and their families, who happen to be abroad are considered as normally resident and are therefore included in the total population, whereas foreign armed forces personnel and members of foreign diplomatic corps, and their families are excluded. Merchant seamen who have their domicile in that coun-

try, and who are working on ships trading abroad, are included. For the United Kingdom exceptionally, the population includes foreign armed forces.

Problem areas

The most important impediment to comparability of total population is the difference between de facto and de jure population. A de facto population should include all persons physically present in the country or area at the reference date. The de jure population, by contrast, should include all usual residents of the given country or area, whether or not they were physically present there at the reference date.

Comparability of even two ostensibly de facto totals or of two ostensibly de jure totals is often affected by the fact that, simple as the two concepts appear, strict conformity to either of them is rare. The necessary detailed information has not been available in many cases. It cannot, therefore, be assumed that figures not thus qualified reflect strict de facto or de jure definitions.

A possible source of variation within the statistics of a single country may arise from the fact that some countries or areas collect information on both the de facto and the de jure population in, for example, a census, but prepare detailed tabulations for only the de jure population. Hence, even though the total population is de facto, the figures shown in the tables presenting age and sex may be de jure. These de jure figures are footnoted when known.

The classification of population by age is a core element of most analysis, estimation and projection of population statistics. Unfortunately, age data are subject to a number of sources of error and non-comparability.

There are two methods of collecting age data. The recommended method is to calculate age at last birthday by subtracting the exact date of birth from the date of the census. Some places, however, do not use this method but instead calculate the difference between the year of birth and the year of census. Classifications of this type are footnoted whenever possible.

Errors in age data may be due to a variety of causes, including ignorance of correct age; reporting years of age in terms of a calendar concept other than completed solar years since birth, carelessness in reporting and recording age; a general tendency to state age in figures ending in certain digits (such as zero, two, five and eight); a tendency to exaggerate length of life at advanced ages; possibly subconscious aversion to certain numbers and wilful misrepresentation arising from motives of an economic, social, political or purely personal character. These reasons for errors in reported age data are common to most investigations of age and to most countries or areas, and they may impair comparability to a marked degree.

B.5 Labour Force

ILO definitions

The data on employment, unemployment and economic activity has been collated using the International Labour Organisation's (ILO) definitions. These definitions were initially agreed at the 13th International Conference of Labour Statisticians, convened in 1982 by the ILO. The definitions have been revised and updated and can, for example, be found in any issue of ILO's *Yearbook of Labour Statistics*. It is usually necessary to use a Labour Force Survey or a General Household Survey to generate the data required by these definitions. This requirement combined with the relatively recent international definition means that some countries are unable to generate internationally comparable data. This also means that the available time series are limited.

Employment

A shortened version of the ILO definition of employment is given below from the ILO Statistical Yearbook (ILO, 1997). Fuller definitions with all the provisos are available in the ILO publications on concepts and methods for performing labour force surveys (ILO, 1990 and 1988).

The "employed" comprise all persons above a specified age who during a specified brief period, either one week or one day, were in the following categories:

- (a) "paid employment":
 - (a1) "at work"
 - (a2) "with a job but not at work"
- (b) "self-employment":
 - (b1) "at work"
 - (b2) "with an enterprise but not at work"

Unemployment

A basic version of the ILO definition of unemployment is given below. Importantly, this definition of unemployment differs from many “headline” versions, which are usually based on administrative records such as unemployment benefit claimants. These “headline” unemployment figures therefore tend to under-report the numbers of unemployed using the ILO definition. The main differences tend to be with young people who have yet to enter employment, and those otherwise excluded from unemployment benefits who are not counted. As with the definition of employment the fuller definition can be found in (ILO, 1988) and (ILO, 1990).

The “unemployed” comprise all persons above a specified age who during the reference period were:

- (a) “without work”
- (b) “currently available for work”
- (c) “seeking work”, i.e. had taken specific steps in a specified recent period to seek paid employment or self-employment.

Economically Active

By comparison to the definitions of employment and unemployment, the definition of the economically active is simply the sum of the employed and unemployed. The only problem here is that since the numbers reported for unemployment based on administrative records are an under-count this in turn means that in countries without Labour Force Surveys, the reported numbers of economically active are also an under-count.

Data sources

Although most of the countries are now using either Labour Force Surveys or Household Surveys to establish the size of their employed and unemployed populations, in many countries outside of the OECD these sources are often a recent introduction. When data is not from such surveys, this is footnoted in the tables. For the European countries the data is from the harmonised Community Labour Force Survey.

Community Labour Force Survey

The survey is intended to cover the whole of the resident population, i.e. all persons whose usual place of residence is in the territory of the Member States of the Community. For technical and methodological reasons, however, it is not possible in all countries to include the population living in collective households, i.e. people living in old peoples’ and other special homes, boarding schools, hospitals, religious institutions, workers’ hostels, etc. Consequently, for the purpose of harmonising the field of survey, the Community results are compiled on the basis of the population of private households only.

The concepts and definitions used in the European Labour Force Survey have been derived from the ILO guidelines since 1983. This has guaranteed the comparability of the results between all the surveys held since that year. The results of surveys held before 1983 are not comparable since they were not based upon these guidelines.

The integration into the 1992 series of a more exact implementation of the guidelines implies that the degree of comparability between the 1983-91 series and the new series from 1992 is slightly less than the comparability within each series. However, the fact that both sets of definitions continue to be based on the ILO guidelines ensures that the differences are minimal.

B.6 External Trade in Goods

The trade data published in the statistical annex are obtained from the UN COMTRADE database which contains the external trade statistics of all UN member states. Detailed explanations of the concepts and definitions used in international trade are provided in the United Nations publication *International Trade Statistics: Concepts and Definitions* (New York, 1982). Below a brief overview is given.

Statistical territory

The statistics reported by a country refer to the *customs area* of the country. In most cases this coincides with the geographical area of the country. Unless otherwise stated, the combination of two territories, formerly separate, results in the elimination from the statistics of their trade with each other. The separation of two territories, formerly together, results in the appearance of their trade with each other in the statistics for each territory.

System of trade

The statistics provided by the COMTRADE database refer often to *General trade*. General imports are the combined total of imports for direct domestic consumption and imports into bonded warehouses or free zones. General exports are the combined total of national exports and re-exports. Re-exports, in the general trade system, consist of the outward movement of nationalised

goods plus goods which, after importation, move outward from bonded warehouses or free zones without having been transformed.

Alternatively, many countries provide statistics referring to *special trade*. Special imports are the combined total of imports for direct domestic consumption (including transformation and repair) and withdrawals from bonded warehouses or free zones for domestic consumption. Special exports comprise exports of national merchandise, namely, goods wholly or partly produced or manufactured in the country, together with exports of nationalised goods (nationalised goods are goods which, having been included in special imports, are then exported without transformation).

Direct transit trade, i.e., goods merely being trans-shipped or moving through the country for purposes of transport only, is excluded from the statistics of both special and general trade.

Valuation

In most cases, imports are valued at c.i.f.. This means that the transaction value is the value at which the goods were purchased by the importer plus the cost of transportation and insurance to the frontier of the importing country. In the case of exports, the transaction value is preferably the value at which the goods were sold by the exporter, including the cost of transportation and insurance, to bring the goods onto the transporting vehicle at the frontier of the exporting country (f.o.b. valuation).

Partner country

For imports, the country of origin or production, the country of consignment, the country of purchase or country of provenance can be recorded. Regarding exports, the country of consumption or consignment, and the country of sale can be distinguished.

Comparability

Because of the different concepts that can be followed by the single countries and a lack of harmonisation, comparisons of the trade statistics between countries are restricted and should be undertaken with caution.

B.7 Direct Investment

Foreign Direct Investment (FDI) is the category of international investment that reflects the objective of obtaining a lasting interest by a resident entity in one economy in an enterprise resident in another economy. The resident entity is the direct investor and the enterprise is the direct investment enterprise. The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the investor on the management of the enterprise.

However, the concept of direct investment differs from the concept of control. To be classified as a direct investor, an investor needs not have the controlling share, or even the largest share, of ownership in an enterprise.

A direct investment enterprise is an unincorporated or incorporated enterprise in which a direct investor owns 10% or more of the ordinary shares or voting power (for an incorporated enterprise) or the equivalent (for an unincorporated enterprise) (Balance of Payments Manual, IMF, 5th edition).

Often the motivation for direct investment is to receive benefits in addition to income that would otherwise accrue on invested capital, such as to obtain resources (also human resources) and access to markets that might otherwise be unavailable to the investor.

FDI comprises equity capital, other capital and reinvested earnings.

- *Equity capital* includes equity in branches, all shares in subsidiaries and associates (except non participating, preferred shares that are treated as debt securities and included under other direct investment capital).
- *Other capital* covers the borrowing and lending of funds, including debt securities and suppliers' credits, between direct investors and subsidiaries, branches and associates. The borrowing and lending are reflected in inter company claims and liabilities respectively. Both loans to subsidiaries from direct investors and loans from subsidiaries to investors are included.
- *Reinvested earnings* consist of the direct investor's share (in proportion to direct equity participation) of earnings not distributed as dividends by subsidiaries or associates and earnings of branches not remitted to the direct investor.

Disinvestment is formally defined as capital invested by the direct investment enterprise in its direct investor, i.e. reverse investment. In other words, the direct investor sells or transfers back the stock it had invested in the direct investment enterprise. A disinvestment is presented in the statistical tables as a negative number.

Despite the availability of the *OECD Benchmark Definition of Foreign Direct Investment, 3rd Edition*, a detailed operational definition fully consistent with the *IMF Balance of Payments Manual, 5th Edition*, the reporting countries often rely on different collection methods and employ different concepts and classifications.

To reach its final objective of compiling meaningful and reliable EUR 15 statistics and comparable Member State statistics, Eurostat collects FDI data via common questionnaires from the Member States. Since 1992 as first reporting period, a joint Eurostat/OECD questionnaire has been adopted. As a result, a lack of coherence in the statistics coming from national sources diminishes the comparability of the data between countries.

As a first step of the harmonisation, Eurostat checks that all instructions to fill in the questionnaire have been followed by the reporting countries. When Eurostat detects relevant deviations from the recommended rules it reallocates national statistics according to the common classification.

A major source of differences is the treatment of reinvested profits. Reinvested earnings (RIE) are not always treated in the same way by the different countries. The main discrepancies are generally due to different allocation periods and also different calculation methods. Some countries allocate the reinvested profits according to the period where these profits will be used, instead of the period where they are earned (the IMF recommendation). Moreover, various calculation methods are applied, the most common being:

$RIE(\text{year}_n) = \text{Result}(\text{year}_n) - \text{dividends paid or due for payment}(\text{year}_n)$

$RIE(\text{year}_n) = \text{Result}(\text{year}_n) - \text{dividends to be paid or due for payment}(\text{year}_{n+1})$

For the moment, Eurostat tries to ensure that all the information about the reinvested earnings is based at least on enterprises balance sheet made at the same period (generally the end of the calendar year). Moreover, Eurostat decided to allocate the RIE according to the year of distribution.

After the harmonisation of Member State data Eurostat performs a set of operations to estimate missing information (mainly due to unavailable and/or confidential data) for each Member State. Once this process is completed Member State data are aggregated to calculate the EUR 15 total. As a general rule country specific estimates are not published.

C. Estimations

Estimations of missing values are made in two cases: to fill in gaps in time series, and to give the reader an indication of the developments in the most recent years. Due to the lack of detailed background information, which would only be available at the level of national institutes, the estimations are relatively crude. For this reason, no individual estimates are published at the country level, but only the sum of the country values into a block total. Such estimated block totals are printed in italics and usually rounded to the nearest 100, to avoid the false idea of exactness, and to highlight the fact that they should be treated with caution.

Methods

Several methods were used for the interpolation of a missing year. One method is based on assuming compound growth between the known data points. This method has advantages over straight line interpolation, but it only allows the two immediate data points to enter the interpolation. If the gap between the known data is more than four years the interpolation has not been attempted and if interpolated data represents more than 25 per cent of a block total this is also ignored.

R&D Expenditure

Some of the gaps in the R&D database were filled by inter- and extrapolating the R&D expenditures time series. This was done in the following way. Time series were constructed for R&D expenditures by performing sector and by funding sector. These data were then expressed as a percentage of GDP (so-called R&D-intensity; because the same deflator is used for R&D as is for GDP, it doesn't matter whether this is done in fixed prices or in current prices). For each of the resulting time series in which data for one or more years of 1980 - 1995 were missing, inter- and extrapolations using so-called 'natural cubic splines' were made for the missing years. Cubic splining is a method of interpolation which not only uses the observations directly adjacent to the missing data, but also data further back or forward in time. It thus uses the general shape of the curve of available data to fill in the gaps. Relative to linear inter- or extrapolation, this method has the advantage that it uses more information than just the two years 'bordering' the gap in the time series. The algorithm provided by Press et al. (1989) was used to do this. The resulting estimates of R&D-intensity were checked, and corrected where the estimations did not seem 'realistic'. There are no 'hard rules' used in the last part of this procedure, but in some cases, mainly where there is only a small number of data points available, the estimations may imply rather large jumps compared to the existing data. This is especially true for extrapolated data. In cases where, the 'cubic spline' estimations didn't seem realistic, they were replaced either by linear interpolations, or by extrapolations using the same value of R&D-intensity as the last (or first, in case of reinterpolation) data point available (a so-called flat trend).

R&D Personnel

Some countries only generate headcount data for their R&D personnel and RSEs. This is usually presented in terms of the numbers of Full Time personnel and the numbers of Full-Time and Part-Time (FT plus PT) personnel. The method used is to apply a fixed conversion factor from the FT plus PT data to an FTE estimate. It is, of course, likely that the conversion factor will change with time and between countries, but the use of a fixed conversion factor has the advantage of transparency and the national conversion factors usually can be established on the basis of at least one year's data. Where the data are available, conversion factors are established and applied at the sectoral level. This method is similar to that used by the OECD to generate their series of adjusted Japanese data (OECD, 1995).

Nowcasting

For the "nowcasting", i.e. the forecasting of not yet available data for 1995 and/or 1996, different models have been applied. Sometimes the latest available data points were extrapolated, either linearly or exponentially. Whenever possible though, ARIMA models were fitted. ARIMA stands for **A**uto **R**egressive **I**ntegrated **M**oving-**A**verage. The analysis performed by ARIMA models is divided in three stages, corresponding to the stages described by Box and Jenkins (1976). In the *identification stage* candidate models are selected, using differencing, autocorrelations, partial autocorrelations and cross correlations. In the *estimation and diagnostic checking stage* the parameters of the candidate models are estimated, and the most appropriate model is chosen based on the diagnostic statistics. In the *forecasting stage* this model is used to forecast future values of the time series under consideration and to generate confidence intervals.

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GLOSSARY of countries, abbreviations and organisations, and specific programmes

Abbreviations for Countries (ISO 3166 2 alpha codes, except for certain European Union countries)

A	Austria	KR	South Korea (sometimes referred to simply as Korea in the report)
AL	Albania	KZ	Kazakhstan
AM	Armenia	L	Luxemburg
AR	Argentina	LB	Lebanon
AU	Australia	LI	Liechtenstein
B	Belgium	LT	Lithuania
BG	Bulgaria	LV	Latvia
BR	Brazil	MA	Morocco
BY	Belarus	MD	Moldova
CA	Canada	MT	Malta
CH	Switzerland	MX	Mexico
CL	Chile	MY	Malaysia
CN	China	NL	The Netherlands
CS	former Czechoslovakia	NO	Norway
CY	Cyprus	NZ	New Zealand
CZ	Czech Republic	PH	The Philippines
D	Germany	PK	Pakistan
DD	former GDR	PL	Poland
DE	former FRG	P	Portugal
DK	Denmark	RO	Romania
DZ	Algeria	ROW	Rest of the World
E	Spain	RU	Russian Federation
EE	Estonia	S	Sweden
EG	Egypt	SG	Singapore
EL	Greece	SI	Slovenia
FIN	Finland	SK	Slovak Republic
F	France	SU	former USSR
GE	Georgia	SY	Syria
HK	Hong Kong	TH	Thailand
HU	Hungary	TN	Tunisia
ID	Indonesia	TR	Turkey
IL	Israel	TW	Taiwan
IN	India	UA	Ukraine
IRL	Ireland	UK	The United Kingdom
IS	Iceland	US	The United States of America
I	Italy	VE	Venezuela
JP	Japan	ZA	South Africa

Abbreviations and organisations

ALAI	Association of Latin American Integration	DAE	Developed Asian Economies
ANBERD	Analytical BERD section the STAN data prepared by OECD	DC	Developing countries
ASEAN	Association of South East Asian Nations	DG	Directorate General (see below for further details)
AVICENNE	European Union Cooperation Initiative with Mediterranean Universities and Research Centres	DSTI	OECD Directorate for Science, Technology and Industry
BECU	Billions (thousands of millions) of ECUs	EC	European Community
BE	Business Enterprise	EEC	European Economic Community
BERD	Business enterprise expenditure on R&D	ECMWF	European Centre for Medium Range Weather Forecasting
BIG	Big companies - framework programme participant type	ECON	Committee on Economic and Monetary Affairs and Industrial Policy of the European Parliament
CEC	Commission of the European Communities (also referred to in the text as the European Commission and the Commission) - <i>senso stricto</i> all three forms mentioned refer to the college of Commissioners rather than the services of the Commission, however, in most cases in this report the three names mean the services of the Commission	ECU	European Currency Unit
CEEC	Central and Eastern European Countries	EDU	High Education Establishment - framework programme participant type
CEFTA	Central European Free Trade Area	EEA	European Economic Area
CERN	Centre Européen Recherche Nucléaire (Geneva, CH)	EFTA	European Free Trade Association
CERT	Committee on Energy, Research and Technology of the European Parliament	EISLAT	European Ion Scattering Facility
CMEA	Council of Mutual Economic Assistance (more often known as COMECON)	EIT	Economies in Transition
CODEST	Committee for the European Development of Science and Technology	EMBL	European Molecular Biology Laboratory (Heidelberg, D)
COM(xx)yyy	Official Commission document reference number	EMBO	European Molecular Biology Organisation
COMECON	see CMEA	EMU	European Monetary Union
COPERNICUS	Co-operation in Science and Technology with Central and Eastern Europe	EP	European Parliament
COST	European Co-operation in the field of Scientific and Technical Research	EPAT	European Patent Office database
CREST	Committee on Research, science and Technology (which advises both the Commission and the Council of Ministers)	EPO	European Patent Office
CSFs	Community Support Frameworks	ERDF	European Regional Development
DABLE	A database (run by the European Commission) of information on companies	ERSTI	European Report on Science and Technology Indicators
		ESA	European Space Agency
		ESF	European Science Foundation
		ESO	European Southern Observatory (CL)
		ESRF	European Synchrotron Radiation Facility
		ESTA	European Science and Technology Assembly
		ET	Engineering and technology
		ETAN	European Technology Assessment Network
		EU	European Union
		EUMETSAT	European Meteorological Satellite
		EUR 12 (EU 12)	the 12 members of the European Union immediately prior to 1995 taken as a whole
		EUR 15 (EU 15)	the 15 members of the European Union post 1995 taken as a whole

EUR XXXXX YY	Official reference number for documents published by the European Commission	IMF	International Monetary Fund
EUROSTAT	Statistical Office of the European Communities	INCO-DC	International Cooperation - Developing Countries
FAO	Food and Agriculture Organisation of the United Nations	INO	International Organisations - framework programme type
FDI	Foreign direct investment	INTAS	International Association for the Promotion of Co-operation with Scientists from the Independent States of the Former Soviet Union
FP1	First Framework Programme for Research, Development and Demonstration Activities (1984 - 1987)	IPC	International Patent Classification
FP2	2nd Framework Programme for Research and Technological Development (1987-1991)	IRDAC	Industrial R&D advisory committee
FP3	3rd Framework Programme for research and technological development (1990 - 1994)	ISCED	International standard classification for education
FP4	4th Framework Programme for Research and Technological Development and Demonstration (1994 - 1998)	ISCO	International standard classification of occupations
FP5	Fifth Framework Programme for Research, Technological Development and Demonstration (1998 - 2002)	ISDB	OECD International Sectoral Database
FSU	Countries of the former Soviet Union	ISIC	International Standard Industrial Classification
FT	Full-time	ISTC	International Science and Technology Centre (Moscow, RU)
FTE	Full-time equivalent	IT	Information Technology
G7	CA, US, D, F, I, JP, UK	LFR	Less Favoured Region
GBAORD	Total government budget appropriations or outlays for R&D	LIHRE	Le Laboratoire Interdisciplinaire de recherche sur des Ressources Humaines et de l'Emploi, Université des Sciences Sociales, Toulouse
GDP	Gross domestic product	LT	Low tech
GERD	Gross domestic expenditure on R&D	MECU	million ECUs
GFCF	Gross fixed capital formation	MERCOSUR	Common Market of Southern Hemisphere
GOVERD	Government intramural expenditure on R&D	MERIT	Maastricht Economic Research Institute on Innovation and Technology (NL)
GNP	Gross national product	MHT	Medium high tech
GUF	General university funds	MLT	Medium low tech
HC	Head Count	NABS	Nomenclature for the Analysis and Comparison of Scientific Programmes and Budgets
HE	Higher education	NACE	General industrial classification of economic activities within the EC
HEE	Higher education establishment	NAFTA	North American Free Trade
HERD	Higher education expenditure on R&D	NATO	North Atlantic Treaty Organisation
HRST	Human resources in science and technology	NICs	Newly Industrialised countries
HT	High tech	NIS	Newly Independent States of the former USSR
ICST	International Centre for Science and Technology (Moscow, RU)	NISTEP	National Institute of Science and Technology (JP)
IES	Institute for Employment Studies (Brighton, UK)	NS	Natural sciences
ILL	Institute Max von Laue - Paul Langevin (Grenoble, F)	NSE	Natural sciences and engineering
ILO	International Labour Organisation		

NSF	National Science Foundation (US)	USPTO	US Patent Office and Trademark Office (sometimes referred to as USPO)
NTBF	New Technology Based Firms	UN	United Nations Organisation
NUTS	Nomenclature of statistical territorial units	UNCTAD	United Nations Conference on Trade and Development
OECD	Organisation for Economic Co-operation and Development	UNDP	United Nations Development Programme
OI	Other industrialised countries	UNESCO	United Nations Education, Scientific and Cultural Organisation
OJ	Official Journal of the European Communities	UNEP	United Nations Environment Programme
OST	Observatoire des Sciences et des Techniques, Paris	UNIDO	United Nations Industrial Development Organisation
OTH	Framework programme participants of types other than BIG, SME, REC, EDU and INO	WB	World Bank
Ph.D.	Doctorate of Philosophy degree	WEU	Western European Union
PECO	countries of Eastern and Central Europe	WHO	World Health Organisation
PPP	Purchasing power parities	WTO	World Trade Organisation
PPS	Purchasing power standards		
PREST	Policy Research in Engineering, Science & Technology, University of Manchester (UK)		
PT	Part-time		
RASCI	Research Association for Science Communication and Information (Frankfurt (Oder), D)		
R&D	Research and development		
REC	Research Centres - framework programme participant type		
RS	Relative specialisation (index)		
RSE	Research scientists and engineers		
RTD	Research and technological development (terminology first used in the Council Decision on 2nd Framework Programme, from the 4th Framework Programme onwards RTD is defined as including not only research and technological development but also demonstration projects)		
S&T	Science and technology		
SCI	Science citation index of ISI		
SME	Small and medium sized enterprises (for definitions see text of the Report), also framework programme participant type		
STAN	OECD structural analysis programme and database		
STI	Science and technology indicators		
STOA	Scientific and technical options assessment programme of the European Parliament		
STS	Scientific and technical services		
TBP	Technology balance of payments		
TIMMS	Third International Mathematics and Science Study (CSTEED, Boston, US)		
TPP	Technology Product and Process		
Triad	Europe - North America - Japan		

FP2 Specific Programmes: Names and Acronyms

(Source: EC Research Funding, 2nd updated Edition, May 1990, CEC - DG XII)

Aeronautics (Part of BRITE-EURAM)

AIM (Advanced Informatics in Medicine)

BCR (Applied metrology and Chemical Analysis)

BRIDGE (biotechnology)

BRITE-EURAM (industrial technologies and advanced materials)

CAMAR (Competitiveness of agriculture and management of agricultural resources)

Decommissioning of nuclear installations

DELTA (Informatics in Education)

DOSES (Statistical Expert Systems)

DRIVE (Informatics and Telecommunications in Road Safety)

ECLAIR (Agro-industrial Technologies)

EPOCH (Environmental Protection, Climatology and Natural Hazards, see also STEP)

ESPRIT (Information Technologies)

EURET (Transport)

EUROTRA (Machine Translation)

FAR (Fisheries and Aquaculture)

FAST (part of the MONITOR specific programme, dealing with Forecasting and Assessment in Science and Technology)

FLAIR (Food Technologies)

Human Genome

JOULE (Non-Nuclear Energies and Rational Use of Energy)

Large Facilities (Large Scale Scientific Facilities and Installations)

MAST (Marine Science and Technology)

Medical and Health

MONITOR (Strategic Analysis, Forecasting and Evaluation)

RACE (Advanced Communication Technologies)

Radiation Protection

Radioactive Waste

Raw Materials

SAST (part of the MONITOR specific programme, dealing with Strategic Analysis in Science and Technology)

SCIENCE (Scientific and Technical Co-operation)

SPEAR (part of the MONITOR specific programme, dealing with Evaluation Activities in Research)

SPES (Economic Science)

SPRINT (Innovation and Technology Transfer)

STD (Science and Technology for Development)

STEP (Environmental Protection, Climatology and Natural Hazards, see also EPOCH)

STRIDE (Science and Technology for Regional Innovation and Development in Europe)

TELEMAN (Remote Handling in Hazardous or Disordered Nuclear Environments)

VALUE (Dissemination of Results)

FP3 Specific Programmes: Names and Acronyms

(EC Research Funding, 3rd fully revised edition, September 1992, CEC - DG XII)

Aeronautics (part of Industrial and Materials Technologies)

Agriculture and agro-industry (including fisheries)

Biomedicine and Health

Biotechnology

Communications Technology

CRAFT (part of the Industrial and Materials Technologies)

Environment

FUSION (Controlled Thermonuclear Fusion)

Human Capital and Mobility

Industrial and Materials Technologies

Information Technology

Life Sciences and Technologies for Developing Countries

Marine Science and Technology

Measurement and Testing

Non-nuclear Energies

Nuclear Fission Safety

TELEMATICS (Telematics Systems of General Interest)

FP4 Specific Programmes: Names and Acronyms

(EC research funding, a guide for applicants, 4th edition completely revised 1996, CEC - DG XII)

Advanced Communications Technologies and Services - ACTS

Agriculture and Fisheries

Biomedicine and Health

Biotechnology

Controlled Thermonuclear Fusion

Co-operation with Third Countries and International Organisations

Dissemination and Optimisation of Results

Environment and Climate

Industrial and Materials Technologies

Information Technologies

Marine Science and Technology

Non-Nuclear Energy

Nuclear Fission Safety

Standards, Measurements and Testing

Telematics Applications

Targeted Socio-economic Research

Training and Mobility of researchers

Transport

List of the Directorates General and principal services of the European Commission

Secretariat-General of the Commission

Forward Studies Unit

Inspectorate-General

Legal Service

Spokesman's Service

Joint Interpreting and Conference Service

Statistical Office (Eurostat)

Translation Service

Informatics Directorate

Security Office

DG I External Relations - North America, the Far East, Australia and New Zealand

DG IA External Relations - Europe and the NIS

DG IB External Relations - Southern Mediterranean, Middle East, Latin America, South and South East Asia and North - South Co-operation

DG II Economic and Financial Affairs

DG III Industry

DG IV Competition

DG V Employment, Industrial Relations and Social Affairs

DG VI Agriculture

DG VII Transport

DG VIII Development (Africa, the Caribbean and the Pacific)

DG IX Personnel and Administration

DG X Information, Communication, Culture and Audio-visual Media

DG XI Environment, Nuclear Safety and Civil Protection

DG XII Science, Research and Development

JRC Joint Research Centre

DG XIII Telecommunications, Information Market and Exploitation of Research

DG XIV Fisheries

DG XV Internal Market and Financial Services

DG XVI Regional Policy and Cohesion

DG XVII Energy

DG XVIII Credit and Investments

DG XIX Budgets

DG XX Financial Control

DG XXI Customs and Indirect Taxation

DG XXII Education, Training and Youth

DG XXIII Enterprise Policy, Distributive Trades, Tourism and Co-operatives

DG XXIV Consumer Policy and Consumer Health Protection

European Community Humanitarian Office

Eurotom Supply Office

Office for Official Publications of the European Communities (OPOCE)