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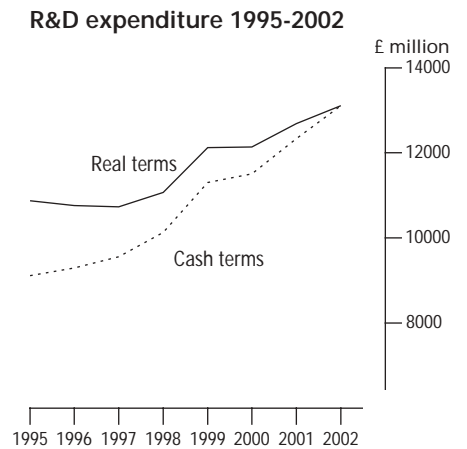
Business Enterprise Research and Development 2002

In 2002, in cash terms and compared to 2001:

- Total expenditure increased by six per cent to £13.1bn
- Civil expenditure increased by nine per cent to £11.5bn
- Defence expenditure decreased by ten per cent to £1.6bn

In 2002, in real terms (2002 prices) and compared to 2001:

- Total expenditure increased by three per cent to £13.1bn
- Civil expenditure increased by six per cent to £11.5bn
- Defence expenditure decreased by twelve per cent to £1.6bn



The 2001 estimates have been revised due to the availability of updated company information. All associated expenditure tables in this release have been affected. Employment data is unchanged.

Expenditure performed by Business Enterprise in cash & real terms 1998 to 2002

	£ million					Percentage change
	1998	1999	2000	2001r	2002	01-02
In cash terms						
Civil	8,600	9,626	9,838	10,513	11,461	+9
Defence	1,533	1,675	1,671	1,824	1,649	-10
Total	10,133	11,302	11,510	12,336	13,110	+6
In real terms (2002 prices)						
Civil	9,398	10,329	10,377	10,813	11,461	+6
Defence	1,675	1,797	1,763	1,876	1,649	-12
Total	11,073	12,127	12,141	12,688	13,110	+3

r= revised

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UK Business Enterprise R&D 2002

Expenditure on R&D performed in UK businesses: cash and real terms; 1995 to 2002 (Table 1)

In 2002, £13.1 billion was spent on R&D performed within UK businesses – a rise of 6 per cent at current prices compared to the 2001 total. Total R&D Expenditure in 2002 represented approximately 1.2 per cent of GDP as in previous years.

Expenditure on R&D performed in UK businesses: product groups, 1995 to 2002 (Table 2)

The product group with the largest R&D expenditure was pharmaceuticals: expenditure in 2002 was £3,304 million, 25 per cent of all spending. Other major product groups were aerospace accounting for £1,347 million (10 per cent) and radio, television and communication equipment £957 million (7 per cent).

Sources of funds for R&D performed in UK businesses: 1995 to 2002 (Table 3) and 1997 to 2002 (Table 6)

Funding of R&D from businesses' "own funds" was £7,712 million in 2002 (59 per cent of the total). Funding of R&D in UK businesses from abroad was £3,567 million in 2002 (27 per cent of the total). Funding of R&D in UK businesses by the UK Government was £884 million in 2002 (7 per cent of the total). The distribution of the sources of funds for business R&D in 2002 is shown in Chart 1. Table 6 shows the sources of funds broken down by civil and defence. The distribution of the source of funds for civil and defence R&D in 2002 is shown in Chart 4.

Employment on R&D performed in UK businesses: 1995 to 2002 (Table 4)

The number of staff employed on R&D increased by 10 per cent between 2001 and 2002 with scientists and engineers accounting for 63 per cent of the staff employed on R&D in 2002. The level of technicians increased by 9 per cent on 2001 figures and administrative staff increased 3 per cent between 2001 and 2002. This distribution is shown in Chart 2.

Expenditure on R&D performed within UK businesses: civil and defence, by broad product group, 1997 to 2002 (Table 5)

In real terms, civil R&D increased by 6 per cent in 2002 and defence R&D decreased by 12 per cent from 2001.

In 2002 in cash terms chemical products accounted for 34 per cent of the total civil R&D expenditure. The second largest civil R&D broad product group was services, accounting for 22 per cent of total civil R&D expenditure. Defence R&D continued to be dominated by the aerospace product group, followed by electrical machinery and mechanical engineering. The distribution of civil and defence R&D expenditure by broad product groups for 2002, are shown in Chart 3.

Regional breakdown for Business Enterprise expenditure on R&D in the UK: 2000 to 2002 (Table 7)

In 2002, 93 per cent of business R&D expenditure was carried out in England, a similar level to previous years. The regions with the largest R&D expenditure were again the South East which accounted for 25 per cent of the total expenditure and Eastern which accounted for 21 per cent, followed by the North West and Merseyside with 13 per cent. The regional breakdown for business R&D in 2002 is shown in Chart 5.

BACKGROUND NOTES

The 2002 Survey

Sample design

1. The 2002 survey was an annual sample survey based on a continually updated register of R&D performers.
2. Approximately 4000 forms were sent out to businesses believed to be performing R&D. These companies were selected using a stratified sample.
3. The 399 largest R&D spenders in 2002 were all sampled. These accounted for 85 per cent of the 2002 total R&D expenditure figure. Smaller R&D performers and others believed to be performing R&D were selected using various sampling fractions. Industry group and company employment were the stratification variables.
4. Completed forms were returned by 3,844 businesses, representing a response rate of 96 per cent.
5. Estimates were made for the R&D activity of unsampled and non-responding businesses.

Revisions to past data

6. The 2001 data have been revised where necessary to take account of company misreporting.

More detailed information

7. A more detailed analysis of the results of this survey, and description of methods used, will be published in Business Monitor MA14, which will be available on the internet at www.statistics.gov.uk 23 January 2004.

Definitions

Research and Experimental Development (R&D)

8. R&D and related concepts follow internationally agreed standards defined by the Organisation for Economic Co-operation and Development (OECD) and published in the Frascati manual. R&D is defined as "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 the stock of knowledge to devise new applications".

R&D performed in UK businesses

9. This refers to R&D performed in the UK within business enterprises. It excludes R&D funded by UK businesses that is performed overseas or in other sectors of the UK economy (such as higher education; government departments, agencies, and non-departmental public bodies; local authorities; and private non-profit organisations). Public corporations are counted as business enterprises.

Product Groups

10. The broad product groups consist of aggregations of the detailed product groups. "Services" includes R&D consultancy and other services in support of manufacturing industry.

Employment

11. Employment is calculated by respondents on the basis of "full-time equivalent" staff averaged over the year. The categories of employment used are:
 - **Scientists and Engineers:** professionals engaged in the conception or creation of new knowledge, products, methods and systems.
 - **Technicians:** qualified personnel who participate in R&D projects by performing scientific and technical tasks, normally under the supervision of professional scientists and engineers. They will usually have a scientific or engineering qualification.
 - **Administrative and Other:** other supporting staff, including skilled and unskilled craftsmen, secretarial and clerical staff participating in R&D projects or directly associated with such projects.

Rounding of Figures

12. There may be discrepancies between totals and the sum of their independently rounded components.

General

13. For information on available aggregated data on Research and Development please contact Jane Morgan on 01633 813109, (e-mail jane.morgan@ons.gov.uk).
14. Details of the National Statistics policy governing the release of new data are available from the ONS press office. Also available is a list of the names of those given pre-publication access to the contents of this release.
15. **National Statistics** are produced to high professional standards set out in the National Statistics Code of Practice. They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from any political interference. © Crown Copyright 2003.

1 EXPENDITURE ON R&D PERFORMED IN UK BUSINESSES: CASH AND REAL TERMS AND AS A PERCENTAGE OF GDP, 1995 TO 2002

		£million							
		1995	1996	1997	1998	1999	2000	2001	2002
In cash terms	DLBX	9 116	9 297	9 556	10 133	11 302	11 510	12 336	13 110
In real terms (2002 prices)		10 873	10 764	10 728	11 073	12 127	12 141	12 688	13 110
Current prices GDP	DLHT	729 389	774 140	823 599	869 275	919 696	963 508	1 006 043	1 054 974
As a % of GDP		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

2002 = 100

Source: National Statistics

	1995	1996	1997	1998	1999	2000	2001	2002
GDP deflator used to convert cash terms to real terms	83.8	86.4	89.1	91.5	93.2	94.8	97.2	100.0

1 2001 R&D cash & real terms data have been revised due to the availability of updated company information.

2 EXPENDITURE ON R&D PERFORMED IN UK BUSINESSES: DETAILED PRODUCT GROUPS, 1995 TO 2002

		£million								% of total
		1995	1996	1997	1998	1999	2000	2001	2002	2002
TOTAL	DLBX	9 116	9 297	9 556	10 133	11 302	11 510	12 336	13 110	100
Agriculture, hunting and forestry; Fishing	DLBY	..	76	84	102	115	135	96	122	0.9
Extractive Industries	DLBZ	..	64	44	41	42	46	43	52	0.4
Food products and beverages; Tobacco products	DLCF	189	198	180	242	237	264	314	299	2.3
Textiles, clothing and leather products	DLCQ	23	27	33	33	28	29	17	19	0.1
Pulp, paper and paper products; Printing and publishing; Wood and straw products	DLCT	39	57	44	49	45	38	34	44	0.3
Refined petroleum products and coke oven products; Processing of nuclear fuel	DLCE	239	230	225	234	212	182	250	258	2.0
Chemicals, man-made fibres	DLCB	701	627	680	688	718	682	522	583	4.4
Pharmaceuticals, medical chemicals and botanical products	DLCD	1 813	1 852	2 151	2 238	2 535	2 846	3 040	3 304	25.2
Rubber and plastic products	DLCR	60	67	60	66	72	54	45	64	0.5
Other non-metallic mineral products	DLCG	54	60	47	56	59	..	41	46	0.4
Casting of iron and steel	DLCJ	46	39	39	47	41	..	31	32	0.2
Non-ferrous metals	DLCK	20	15	15	20	22	21	19	16	0.1
Fabricated metal products	DLCL	100	91	88	90	70	73	64	59	0.5
Machinery and equipment	DLCO	583	577	622	640	642	703	843	767	5.9
Office machinery and computers	DLCN	150	161	102	125	111	113	105	146	1.1
Electrical machinery and apparatus	DLCA	494	490	424	423	357	422	451	462	3.5
Radio, television and communication equipment	DLCB	602	662	655	772	867	1 024	1 044	957	7.3
Precision instruments	DLCM	303	307	336	340	473	480	488	442	3.4
Motor vehicles and parts	DLCG	795	926	924	913	1 060	864	898	929	7.1
Other transport equipment	DLCI	18	30	50	72	99	158	208	..	..
Shipbuilding and repairs	DLCH	20	20	15	36	76	72	83	..	..
Aerospace	DLCF	886	812	893	1 039	1 237	1 091	1 260	1 347	10.3
Furniture; Other manufactured goods	DLCU	21	16	25	20	33	27	31	48	0.4
Recycling	DLCV	..	1	-	-	1	1	1	3	-
Electricity, gas and water supply	DLCW	168	148	130	140	137	160	99	116	0.9
Construction	DLCX	8	8	38	39	41	34	30	35	0.3
Wholesale and retail trade	DLDE	..	..	..	..	..	..	55	..	..
Transport and storage	DLCY	..	..	..	..	..	..	12	..	..
Post and telecommunications	DLCZ	414	455	496	449	565	674	733	742	5.7
Miscellaneous business activities; Technical testing and analysis	DLDC	..	141	142	157	196	131	242	360	2.7
Computer and related activities	DLDB	675	749	680	688	713	611	725	888	6.8
Research and development services	DLDA	247	369	313	346	448	428	495	558	4.3
Public administration	DLDD	14	10	6	8	11	12	18	18	0.1

Source: National Statistics

1 .. denotes disclosive figures.

2 - denotes nil, figures unavailable or too small to display.

3 Data for 2001 have been revised due to the availability of updated company information.

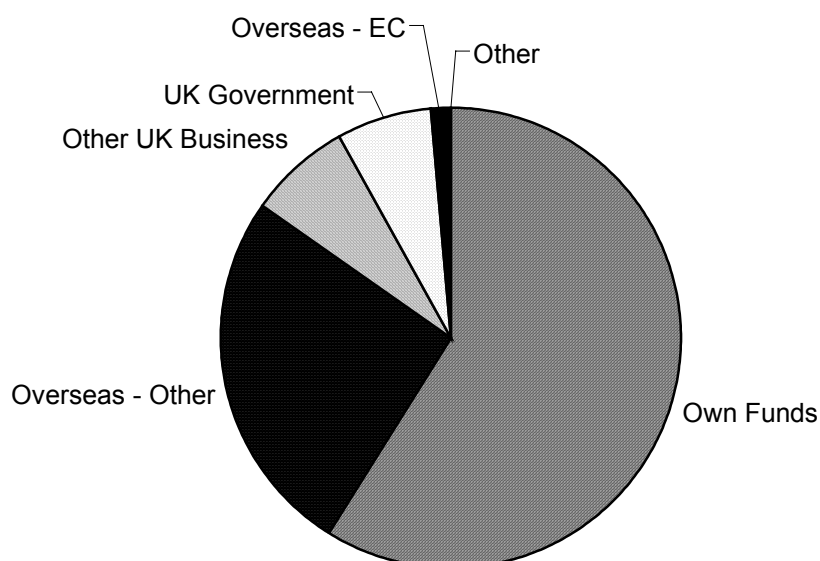
3 SOURCES OF FUNDS FOR R&D PERFORMED WITHIN UK BUSINESSES: 1995 TO 2002

		1995	1996	1997	1998	1999	2000	2001	2002
£ MILLION									
TOTAL	DLBX	9 116	9 297	9 556	10 133	11 302	11 510	12 336	13 110
UK Government	DLDO	953	842	915	1 094	1 157	1 013	1 101	884
Overseas total	DLHK	1 738	2 018	1 800	2 238	2 570	2 470	3 012	3 567
of which:									
EC Programmes	DLDQ	93	131	108	119	137	101	109	177
All other funding from abroad	DLDS	1 645	1 887	1 692	2 119	2 433	2 369	2 903	3 391
Other UK Business	DLDU	700	691	642	659	750	779	764	942
Own funds	DLDW	5 723	5 742	6 198	6 141	6 824	7 244	7 455	7 712
Other	DLDY	3	5	1	–	1	3	4	4
PERCENT									
TOTAL		100	100	100	100	100	100	100	100
UK Government		10	9	10	11	10	9	9	7
Overseas total		19	22	19	22	23	21	24	27
of which:									
EC Programmes		1	1	1	1	1	1	1	1
All other funding from abroad		18	20	18	21	22	21	24	26
Other UK Business		8	7	7	7	7	7	6	7
Own funds		63	62	65	61	60	63	60	59
Other		–	–	–	–	–	–	–	–

Source: National Statistics

- 1 - denotes nil, figures unavailable or too small to display.
- 2 'Other' includes funds from Private Non-Profit organisations and Higher Education establishments
- 3 Data for 2001 have been revised due to the availability of updated company information.

Chart 1 - Sources of funds for R&D performed within UK businesses, 2002



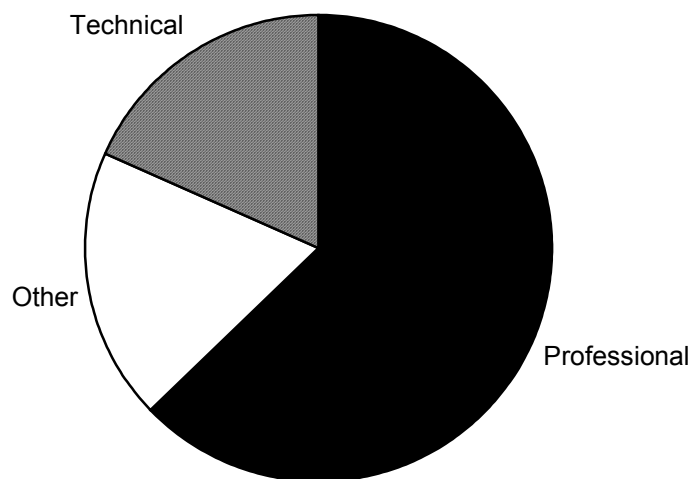
4 EMPLOYMENT ON R&D PERFORMED WITHIN UK BUSINESSES: 1995 TO 2002

Full time equivalent in thousands

		1995	1996	1997	1998	1999	2000	2001	2002
TOTAL	DLEI	145	142	137	148	153	145	152	167
Scientists and engineers	DLEJ	82	82	83	91	92	86	93	105
Technicians, laboratory assistants and draughtsmen	DLEK	33	33	30	32	33	30	28	30
Administrative, clerical, industrial and other staff	DLEL	29	27	24	24	28	30	31	32
As % of total employment									
Scientists and engineers		57	58	61	61	60	59	61	63
Technicians, laboratory assistants and draughtsmen		23	23	22	22	22	21	18	18
Administrative, clerical, industrial and other staff		20	19	18	16	18	21	20	19

Source: National Statistics

Chart 2 - Employment on R&D performed within UK businesses, 2002



- Professional = Scientists and engineers
- Other = Admin, clerical, industrial and other staff
- Technical = Technicians, lab assistants and draughtsmen

5 EXPENDITURE ON CIVIL AND DEFENCE R&D PERFORMED IN UK BUSINESSES: BROAD PRODUCT GROUPS, 1997 TO 2002

£million

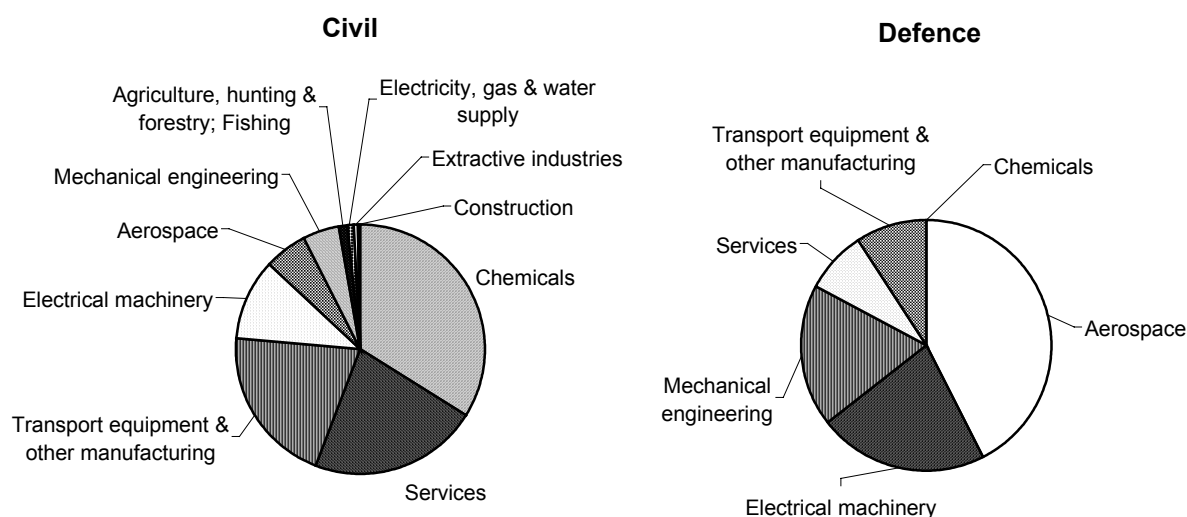
		Civil						Defence						
		1997	1998	1999	2000	2001	2002	1997	1998	1999	2000	2001	2002	
In cash terms														
TOTAL	DLBV	8 112	8 600	9 626	9 838	10 513	11 461	DLBW	1 443	1 533	1 675	1 671	1 824	1 649
Manufacturing	DLEP	6 303	6 725	7 376	7 582	8 089	8 626	DLEX	1 305	1 417	1 619	1 649	1 699	1 514
Chemicals	DLEQ	2 829	2 926	3 252	3 527	3 562	3 885	DLEY	2	-	1	-	-	2
Mechanical engineering	DLER	407	455	434	463	470	524	DLEZ	302	276	279	314	437	302
Electrical machinery	DLES	803	916	1 013	1 163	1 200	1 204	DLFA	377	404	322	395	399	361
Transport equipment	DLET	979	983	1 159	1 023	1 106	..	DLFB	11	36	77	71	82	..
Aerospace	DLEU	412	485	535	457	621	645	DLFC	481	554	701	634	639	702
Other manufacturing	DLEV	873	960	983	948	1 130	..	DLFD	131	147	239	235	141	..
Services	DLEW	1 513	1 552	1 915	1 883	2 155	2 511	DLFE	139	116	57	22	125	135
Other: Total	LDIL	295	322	335	374	268	324	LDJJ	-	-	-	-	-	-
Agriculture, hunting & forestry; Fishing	LDIN	84	102	115	135	96	122	LDJL	-	-	-	-	-	-
Extractive industries	LDIS	44	41	42	46	43	52	LDKF	-	-	-	-	-	-
Electricity, gas & water supply	LDJB	130	140	137	160	99	116	LDKG	-	-	-	-	-	-
Construction	LDJG	38	39	41	34	30	35	LDKS	-	-	-	-	-	-

		Civil						Defence						
		1997	1998	1999	2000	2001	2002	1997	1998	1999	2000	2001	2002	
In real terms (2002 prices)														
TOTAL		9 107	9 398	10 329	10 377	10 813	11 461		1 620	1 675	1 797	1 763	1 876	1 649
Manufacturing		7 076	7 349	7 915	7 998	8 320	8 626		1 465	1 549	1 737	1 739	1 747	1 514
Chemicals		3 176	3 198	3 489	3 720	3 664	3 885		2	-	1	-	-	2
Mechanical engineering		457	497	466	488	483	524		339	302	299	331	449	302
Electrical machinery		901	1 001	1 087	1 227	1 234	1 204		423	441	346	417	410	361
Transport equipment		1 099	1 074	1 244	1 079	1 138	..		12	39	83	75	84	..
Aerospace		463	530	574	482	639	645		540	605	752	669	657	702
Other manufacturing		980	1 049	1 055	1 000	1 162	..		147	161	256	248	145	..
Services		1 699	1 696	2 055	1 986	2 216	2 511		156	127	61	23	129	135
Other: Total		331	352	359	395	276	324		-	-	-	-	-	-
Agriculture, hunting & forestry; Fishing		94	111	123	142	99	122		-	-	-	-	-	-
Extractive industries		49	45	45	49	44	52		-	-	-	-	-	-
Electricity, gas & water supply		146	153	147	169	102	116		-	-	-	-	-	-
Construction		43	43	44	36	31	35		-	-	-	-	-	-

Source: National Statistics

- 1 .. denotes disclosive figures.
- 2 - denotes nil, figures unavailable or too small to display.
- 3 Data for 2001 have been revised due to the availability of updated company information.

Chart 3 - Expenditure on civil and defence R&D performed in UK businesses, by broad product groups, 2002



Note - Transport equipment & other manufacturing have been combined to prevent disclosive data.

6 SOURCES OF FUNDS FOR R&D IN UK BUSINESSES: CIVIL AND DEFENCE, 1997 TO 2002

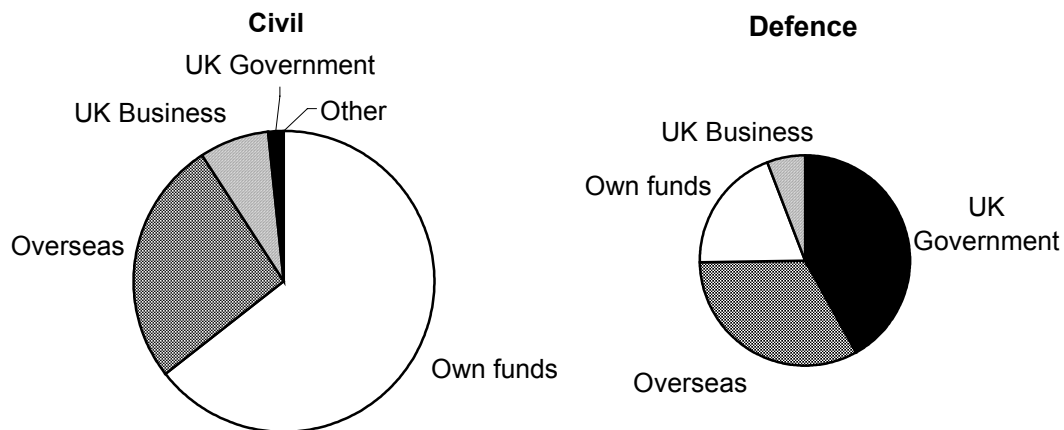
£million

		Civil						Defence						
		1997	1998	1999	2000	2001	2002	1997	1998	1999	2000	2001	2002	
UK Government	DLFG	198	307	316	228	191	193	DLFN	717	787	841	785	911	691
Overseas total	DLHS	1 475	1 857	2 092	2 003	2 585	3 026	DLIF	325	381	478	467	427	541
of which:														
EC Programmes	DLFH	108	119	137	101	109	177	DLFO	—	—	—	—	—	—
All other funding from abroad	DLFI	1 367	1 738	1 955	1 902	2 476	2 849	DLFP	325	381	478	467	427	541
Other UK Business	DLFJ	556	566	670	688	666	848	DLFQ	86	93	80	90	98	94
Own	DLFK	5 883	5 869	6 548	6 916	7 068	7 390	DLFR	315	272	276	328	387	322
Other	DLFL	—	—	1	3	4	4	DLFS	—	—	—	—	—	—
TOTAL	DLBV	8 112	8 600	9 626	9 838	10 513	11 461	DLBW	1 443	1 533	1 675	1 671	1 824	1 649

Source: National Statistics

1 Data for 2001 have been revised due to the availability of updated company information.

Chart 4 - Source of funds for R&D in UK businesses, civil and defence, 2002



7 GOVERNMENT OFFICES REGIONAL BREAKDOWN OF R&D PERFORMED WITHIN UK BUSINESSES: EXPENDITURE AND EMPLOYMENT, 2000 TO 2002

		Expenditure £million			% of total 2002		Employment FTE in thousands		
		2000	2001	2002			2000	2001	2002
United Kingdom	DLBX	11 510	12 336	13 110	100	DLBI	145	152	167
England	DLKI	10 827	11 538	12 150	92.7	DLKJ	135	139	151
North East	DLJO	164	119	128	1.0	DLJZ	3	2	3
North West and Merseyside	DLJT	1 451	1 512	1 661	12.7	DLKE	17	17	18
Yorkshire and Humber	DLJP	304	298	357	2.7	DLKA	6	6	7
East Midlands	DLJQ	933	951	1 063	8.1	DLKB	14	13	15
West Midlands	DLJN	576	662	695	5.3	DLJY	10	11	13
Eastern	DLJR	2 758	2 916	2 741	20.9	DLKC	30	29	32
London	DLKL	810	738	950	7.2	DLKM	10	9	10
South East	DLJS	2 964	3 317	3 268	24.9	DLKD	33	40	39
South West	DLJM	867	1 025	1 286	9.8	DLJX	12	12	14
Wales	DLJU	144	136	170	1.3	DLKF	2	3	3
Scotland	DLJV	400	512	640	4.9	DLKG	6	8	11
Northern Ireland	DLJW	139	150	149	1.1	DLKH	2	3	3

Source: National Statistics

1 FTE - Full Time Equivalents

2 Data for 2001 have been revised due to the availability of updated company information.

Chart 5 - Government Offices regional breakdown of R&D performed within UK businesses, 2002

