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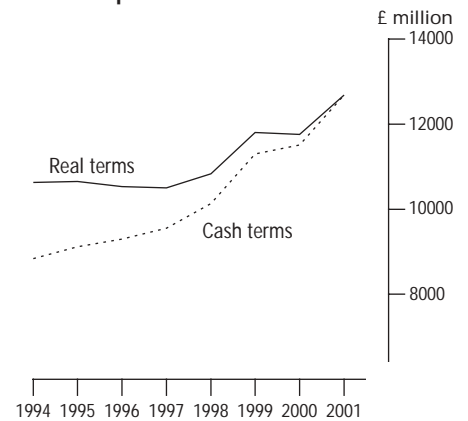
Coverage
United Kingdom
Theme
Commerce, Energy and
Industry

Business Enterprise Research and Development 2001

In 2001, in cash terms and compared to 2000:

- Total expenditure increased by ten per cent to £12.7bn
- Civil expenditure increased by six per cent to £10.5bn
- Defence expenditure increased by thirty three per cent to £2.2bn (*See footnote)

R&D expenditure 1994-2001



In 2001, in real terms (2001 prices) and compared to 2000:

- Total expenditure increased by eight per cent to £12.7bn
- Civil expenditure increased by four per cent to £10.5bn
- Defence expenditure increased by thirty per cent to £2.2bn

Expenditure performed by Business Enterprise in cash & real terms 1997 to 2001

	£ million					Percentage change
	1997	1998	1999	2000	2001	00-01
In cash terms						
Civil	8,112	8,600	9,626	9,838	10,456	+6
Defence	1,443	1,533	1,675	1,671	2,226	+33
Total	9,556	10,133	11,302	11,510	12,682	+10
In real terms (2001 prices)						
Civil	8,913	9,197	10,051	10,050	10,456	+4
Defence	1,586	1,639	1,749	1,707	2,226	+30
Total	10,500	10,836	11,801	11,757	12,682	+8

*Footnote: On 1 July 2001, the Government research agency, the Defence Evaluation and Research Agency (DERA) was disestablished and two new organisations were created. Around a quarter of DERA remained within the Ministry of Defence (MOD) as a government agency whilst the remaining three-quarters became a Private limited company (PLC). As a PLC its R&D activities are now classified and included within the Business sector.

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UK Business Enterprise R&D 2001

Expenditure on R&D performed in UK businesses: cash and real terms; 1994 to 2001 (Table 1)

In 2001, £12.7 billion was spent on R&D performed within UK businesses – a rise of 10 per cent at current prices compared to the 2000 total. Total R&D Expenditure in 2001 represented approximately 1.3 per cent of GDP slightly higher than in 2000.

Expenditure on R&D performed in UK businesses: product groups, 1994 to 2001 (Table 2)

The product group with the largest R&D expenditure was pharmaceuticals: expenditure in 2001 was £3,040 million, 24 per cent of all spending. Other major product groups were aerospace accounting for £1,260 million (10 per cent) and radio, television and communication equipment £1,044 million (8 per cent).

Sources of funds for R&D performed in UK businesses: 1994 to 2001 (Table 3) and 1996 to 2001 (Table 6)

Funding of R&D from businesses' "own funds" was £7,402 million in 2001 (58 per cent of the total). Funding of R&D in UK businesses from abroad was £3,006 million in 2001 (24 per cent of the total). Funding of R&D in UK businesses by the UK Government was £1,504 million in 2001 (12 per cent of the total). The distribution of the sources of funds for business R&D in 2001 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 2001 is shown in Chart 4.

Employment on R&D performed in UK businesses: 1994 to 2001 (Table 4)

The number of staff employed on R&D increased by 5 per cent between 2000 and 2001 with scientists and engineers accounting for 61 per cent of the staff employed on R&D in 2001. The level of technicians decreased by 7% on 2000 figures whereas administrative staff increased slightly between 2000 and 2001. This distribution is shown in Chart 2.

Expenditure on R&D performed within UK businesses: civil and defence, by broad product group, 1996 to 2001 (Table 5)

In real terms, civil R&D increased by 4 per cent in 2001 and defence R&D increased by 30 per cent from 2000.

This large increase in defence expenditure is a result of the disestablishment of the Defence Evaluation and Research Agency (DERA), on 1 July 2001, into two new organisations. Around a quarter of DERA remained within the Ministry of Defence (MOD) as a government agency: the Defence Science & Technology Laboratory (DSTL). The remaining three-quarters became a Private limited company (PLC), currently wholly owned by the MOD. A strategic partnership is being pursued. As a PLC, it is now classified as a private sector organisation and its R&D activities will be included within the Business Enterprise R&D results.

In 2001 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 20 per cent of total civil R&D expenditure. Defence R&D continued to be dominated by the aerospace product group, followed by mechanical engineering and electrical engineering. The distribution of civil and defence R&D expenditure by broad product groups for 2001, are shown in Chart 3.

Regional breakdown for Business Enterprise expenditure on R&D in the UK: 1999 to 2001 (Table 7)

In 2001, 94 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 29 per cent of the total expenditure and Eastern which accounted for 23 per cent, followed by the Northwest and Merseyside with 12 per cent. The regional breakdown for business R&D in 2001 is shown in Chart 5.

BACKGROUND NOTES

The 2001 Survey

Sample design

1. The 2001 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 388 largest R&D spenders in 2001 were all sampled. These accounted for 85 per cent of the 2001 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 3,624 businesses, representing a response rate of 94 per cent.
5. Estimates were made for the R&D activity of unsampled and non-responding businesses.

More detailed information

6. 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 24 January 2003.

Definitions

Research and Experimental Development (R&D)

7. 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

8. 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

9. 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

10. 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

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

General

12. For information on available aggregated data on Research and Development please contact Jane Morgan on 01633 813109, (e-mail jane.morgan@ons.gov.uk).
13. 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.
14. **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 2002.

1 EXPENDITURE ON R&D PERFORMED IN UK BUSINESSES: CASH AND REAL TERMS AND AS A PERCENTAGE OF GDP, 1994 TO 2001

		£million							
		1994	1995	1996	1997	1998	1999	2000	2001
In cash terms	DLBX	8 842	9 116	9 297	9 556	10 133	11 302	11 510	12 682
In real terms (2001 prices)		10 627	10 653	10 531	10 500	10 836	11 801	11 757	12 682
Current prices GDP	DLHT	690 575	729 001	772 856	824 164	868 642	918 202	961 410	997 654
As a % of GDP		1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.3

2001 = 100

Source: National Statistics

	1994	1995	1996	1997	1998	1999	2000	2001
GDP deflator used to convert cash terms to real terms	83.2	85.6	88.3	91.0	93.5	95.8	97.9	100.0

2 EXPENDITURE ON R&D PERFORMED IN UK BUSINESSES: DETAILED PRODUCT GROUPS, 1994 TO 2001

		£million								% of total
		1994	1995	1996	1997	1998	1999	2000	2001	2001
TOTAL	DLBX	8 842	9 116	9 297	9 556	10 133	11 302	11 510	12 682	100
Agriculture, hunting and forestry; Fishing	DLBY	80	..	76	84	102	115	135	96	0.8
Extractive Industries	DLBZ	66	..	64	44	41	42	46	40	0.3
Food products and beverages; Tobacco products	DLCF	228	189	198	180	242	237	264	314	2.5
Textiles, clothing and leather products	DLCQ	22	23	27	33	33	28	29	31	0.2
Pulp, paper and paper products; Printing and publishing; Wood and straw products	DLCT	44	39	57	44	49	45	38	34	0.3
Refined petroleum products and coke oven products; Processing of nuclear fuel	DLCE	203	239	230	225	234	212	182	250	2.0
Chemicals, man-made fibres	DLCC	689	701	627	680	688	718	682	522	4.1
Pharmaceuticals, medical chemicals and botanical products	DLCD	1 820	1 813	1 852	2 151	2 238	2 535	2 846	3 040	24.0
Rubber and plastic products	DLCR	72	60	67	60	66	72	54	45	0.4
Other non-metallic mineral products	D LCS	56	54	60	47	56	59	..	41	0.3
Casting of iron and steel	DLCJ	51	46	39	39	47	41	..	28	0.2
Non-ferrous metals	DLCCK	15	20	15	15	20	22	21	19	0.1
Fabricated metal products	DLCCL	72	100	91	88	90	70	73	64	0.5
Machinery and equipment	D LCO	689	583	577	622	640	642	703	977	7.7
Office machinery and computers	DLCN	134	150	161	102	125	111	113	105	0.8
Electrical machinery and apparatus	D LCA	567	494	490	424	423	357	422	585	4.6
Radio, television and communication equipment	D LCB	517	602	662	655	772	867	1 024	1 044	8.2
Precision instruments	D LCM	273	303	307	336	340	473	480	488	3.8
Motor vehicles and parts	D LCG	669	795	926	924	913	1 060	864	870	6.9
Other transport equipment	D LCI	24	18	30	50	72	99	158	208	1.6
Shipbuilding and repairs	D LCH	17	20	20	15	36	76	72	83	0.7
Aerospace	D LCF	860	886	812	893	1 039	1 237	1 091	1 260	9.9
Furniture; Other manufactured goods	D LCU	28	21	16	25	20	33	27	31	0.2
Recycling	D LCV	1	..	1	-	-	1	1	1	-
Electricity, gas and water supply	D LCW	177	168	148	130	140	137	160	99	0.8
Construction	D LCX	11	8	8	38	39	41	34	30	0.2
Wholesale and retail trade	D LDE	..	..	..	..	..	..	..	55	0.4
Transport and storage	D L CY	..	..	..	..	..	..	..	12	0.1
Post and telecommunications	D LCZ	408	414	455	496	449	565	674	733	5.8
Miscellaneous business activities; Technical testing and analysis	D LDC	104	..	141	142	157	196	131	343	2.7
Computer and related activities	D LDB	744	675	749	680	688	713	611	724	5.7
Research and development services	D LDA	178	247	369	313	346	448	428	493	3.9
Public administration	D LDD	10	14	10	6	8	11	12	18	0.1

1 .. denotes disclosive figures.

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

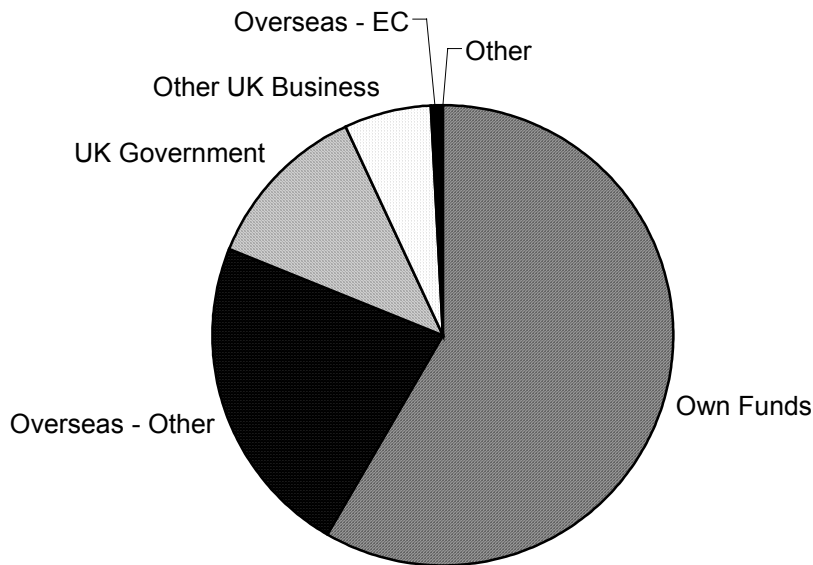
Source: National Statistics

3

SOURCES OF FUNDS FOR R&D PERFORMED WITHIN UK BUSINESSES: 1994 TO 2001

		1994	1995	1996	1997	1998	1999	2000	2001
£ MILLION									
TOTAL	DLBX	8 842	9 116	9 297	9 556	10 133	11 302	11 510	12 682
UK Government	DLDO	910	953	842	915	1 094	1 157	1 013	1 504
Overseas total	DLHK	1 410	1 738	2 018	1 800	2 238	2 570	2 470	3 006
of which:									
EC Programmes	DLDQ	63	93	131	108	119	137	101	108
All other funding from abroad	DLDS	1 347	1 645	1 887	1 692	2 119	2 433	2 369	2 897
Other UK Business	DLDU	474	700	691	642	659	750	779	767
Own funds	DLDW	6 030	5 723	5 742	6 198	6 141	6 824	7 244	7 402
Other	DLDY	19	3	5	1	–	1	3	4
PERCENT									
TOTAL		100	100	100	100	100	100	100	100
UK Government		10	10	9	10	11	10	9	12
Overseas total		16	19	22	19	22	23	21	24
of which:									
EC Programmes		1	1	1	1	1	1	1	1
All other funding from abroad		15	18	20	18	21	22	21	23
Other UK Business		5	8	7	7	7	7	7	6
Own funds		68	63	62	65	61	60	63	58
Other		–	–	–	–	–	–	–	–

Chart 1 - Sources of funds for business R&D, 2001



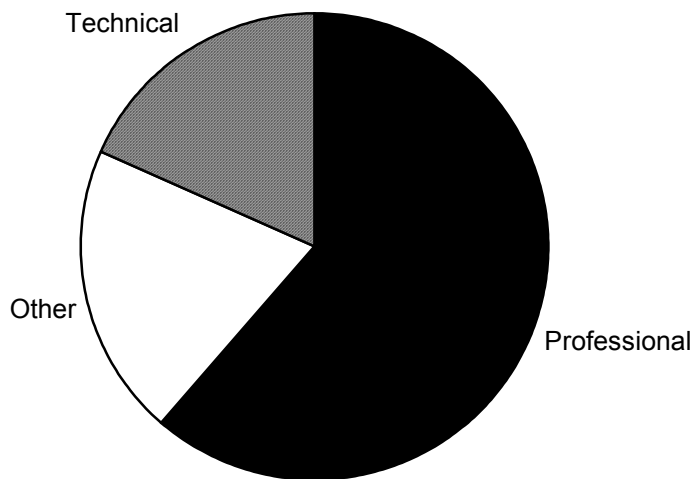
4 EMPLOYMENT ON R&D PERFORMED WITHIN UK BUSINESSES: 1994 TO 2001

Full time equivalent in thousands

		1994	1995	1996	1997	1998	1999	2000	2001
TOTAL	DLEI	150	145	142	137	148	153	145	152
Scientists and engineers	DLEJ	79	82	82	83	91	92	86	93
Technicians, laboratory assistants and draughtsmen	DLEK	40	33	33	30	32	33	30	28
Administrative, clerical, industrial and other staff	DLEL	31	29	27	24	24	28	30	31
As % of total employment									
Scientists and engineers		53	57	58	61	61	60	59	61
Technicians, laboratory assistants and draughtsmen		27	23	23	22	22	22	21	18
Administrative, clerical, industrial and other staff		21	20	19	18	16	18	21	20

Source: National Statistics

Chart 2 - Employment on business R&D, 2001



- 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, 1996 TO 2001

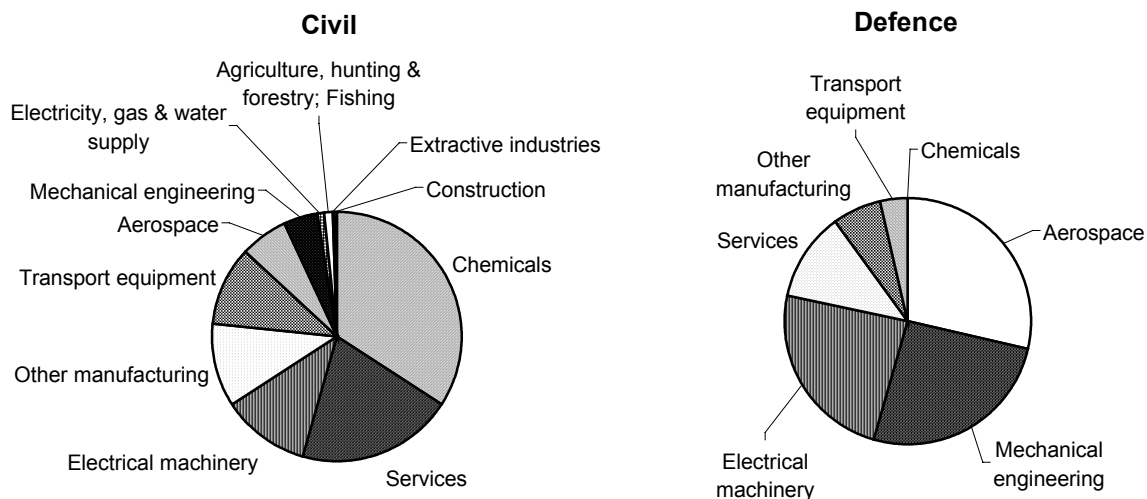
£million

		Civil						Defence						
		1996	1997	1998	1999	2000	2001	1996	1997	1998	1999	2000	2001	
In cash terms														
TOTAL	DLBV	7 937	8 112	8 600	9 626	9 838	10 456	DLBW	1 360	1 443	1 533	1 675	1 671	2 226
Manufacturing	DLEP	5 997	6 303	6 725	7 376	7 582	8 073	DLEX	1 268	1 305	1 417	1 619	1 649	1 967
Chemicals	DLEQ	2 477	2 829	2 926	3 252	3 527	3 562	DLEY	2	2	-	1	-	-
Mechanical engineering	DLER	395	407	455	434	463	470	DLEZ	273	302	276	279	314	571
Electrical machinery	DLES	896	803	916	1 013	1 163	1 200	DLFA	417	377	404	322	395	533
Transport equipment	DLET	967	979	983	1 159	1 023	1 079	DLFB	10	11	36	77	71	82
Aerospace	DLEU	359	412	485	535	457	621	DLFC	453	481	554	701	634	639
Other manufacturing	DLEV	903	873	960	983	948	1 141	DLFD	113	131	147	239	235	141
Services	DLEW	1 644	1 513	1 552	1 915	1 883	2 118	DLFE	92	139	116	57	22	259
Other: Total	LDIL	296	295	322	335	374	265	LDJJ	-	-	-	-	-	-
Agriculture, hunting & forestry; Fishing	LDIN	76	84	102	115	135	96	LDJL	-	-	-	-	-	-
Extractive industries	LDIS	64	44	41	42	46	40	LDKF	-	-	-	-	-	-
Electricity, gas & water supply	LDJB	148	130	140	137	160	99	LDKG	-	-	-	-	-	-
Construction	LDJG	8	38	39	41	34	30	LDKS	-	-	-	-	-	-

		Civil						Defence						
		1996	1997	1998	1999	2000	2001	1996	1997	1998	1999	2000	2001	
In real terms (2001 prices)														
TOTAL		8 990	8 913	9 197	10 051	10 050	10 456		1 540	1 586	1 639	1 749	1 707	2 226
Manufacturing		6 793	6 926	7 192	7 702	7 745	8 073		1 436	1 434	1 515	1 690	1 684	1 967
Chemicals		2 806	3 108	3 129	3 396	3 603	3 562		2	2	-	1	-	-
Mechanical engineering		447	447	487	453	473	470		309	332	295	291	321	571
Electrical machinery		1 015	882	980	1 058	1 188	1 200		472	414	432	336	403	533
Transport equipment		1 095	1 076	1 051	1 210	1 045	1 079		11	12	38	80	73	82
Aerospace		407	453	519	559	467	621		513	529	592	732	648	639
Other manufacturing		1 023	959	1 027	1 026	968	1 141		128	144	157	250	240	141
Services		1 862	1 662	1 660	2 000	1 923	2 118		104	153	124	60	22	259
Other: Total		335	324	344	350	382	265		-	-	-	-	-	-
Agriculture, hunting & forestry; Fishing		86	92	109	120	138	96		-	-	-	-	-	-
Extractive industries		72	48	44	44	47	40		-	-	-	-	-	-
Electricity, gas & water supply		168	143	150	143	163	99		-	-	-	-	-	-
Construction		9	42	42	43	35	30		-	-	-	-	-	-

Source: National Statistics

Chart 3 - Civil and defence R&D expenditure by broad product groups, 2001



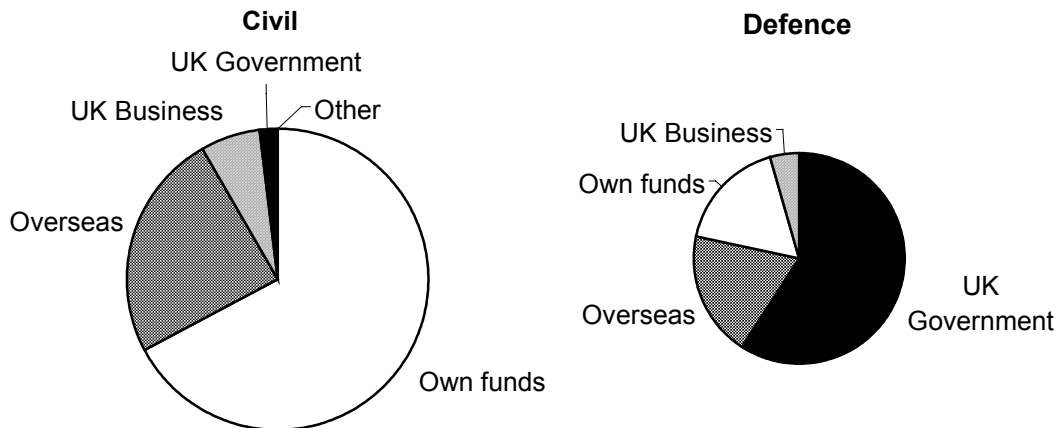
6 SOURCES OF FUNDS FOR R&D IN UK BUSINESSES: CIVIL AND DEFENCE, 1996 TO 2001

£million

		Civil						Defence						
		1996	1997	1998	1999	2000	2001	1996	1997	1998	1999	2000	2001	
UK Government	DLFG	150	198	307	316	228	190	DLFN	693	717	787	841	785	1 314
Overseas total	DLHS	1 715	1 475	1 857	2 092	2 003	2 579	DLIF	303	325	381	478	467	427
of which:														
EC Programmes	DLFH	131	108	119	137	101	108	DLFO	—	—	—	—	—	—
All other funding from abroad	DLFI	1 584	1 367	1 738	1 955	1 902	2 471	DLFP	303	325	381	478	467	427
Other UK Business	DLFJ	623	556	566	670	688	668	DLFQ	68	86	93	80	90	98
Own	DLFK	5 446	5 883	5 869	6 548	6 916	7 015	DLFR	296	315	272	276	328	386
Other	DLFL	5	—	—	1	3	4	DLFS	—	—	—	—	—	—
TOTAL	DLBV	7 937	8 112	8 600	9 626	9 838	10 456	DLBW	1 360	1 443	1 533	1 675	1 671	2 226

Source: National Statistics

Chart 4 - Source of funds for civil and defence business R&D, 2001



7 GOVERNMENT OFFICES REGIONAL BREAKDOWN OF R&D PERFORMED WITHIN UK BUSINESSES: EXPENDITURE AND EMPLOYMENT, 1999 TO 2001

		Expenditure £million			% of total 2001		Employment FTE in thousands		
		1999	2000	2001			1999	2000	2001
United Kingdom	DLBX	11 302	11 510	12 682	100	DLEI	153	145	152
England	DLKI	10 607	10 827	11 885	93.7	DLKJ	141	135	139
North East	DLJO	164	164	118	0.9	DLJZ	3	3	2
North West and Merseyside	DLJT	1 476	1 451	1 512	11.9	DLKE	18	17	17
Yorkshire and Humber	DLJP	309	304	298	2.3	DLKA	6	6	6
East Midlands	DLJQ	838	933	950	7.5	DLKB	12	14	13
West Midlands	DLJN	724	576	641	5.1	DLJY	12	10	11
Eastern	DLJR	2 559	2 758	2 913	23.0	DLKC	30	30	29
London	DLKL	735	810	737	5.8	DLKM	10	10	9
South East	DLJS	2 916	2 964	3 693	29.1	DLKD	35	33	40
South West	DLJM	887	867	1 022	8.1	DLJX	13	12	12
Wales	DLJU	203	144	136	1.1	DLKF	3	2	3
Scotland	DLJV	393	400	512	4.0	DLKG	7	6	8
Northern Ireland	DLJW	99	139	150	1.2	DLKH	2	2	3

1 FTE - Full Time Equivalents

Source: National Statistics

Chart 5 - Regional breakdown for business R&D, 2001

