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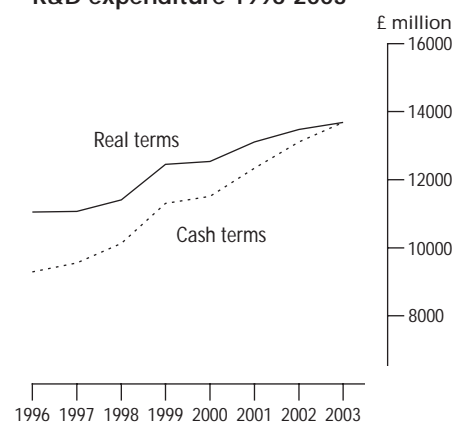
**Coverage**  
United Kingdom  
**Theme**  
Commerce, Energy and  
Industry

## UK Business Enterprise Research and Development 2003

In 2003, in cash terms and compared with 2002:

- Total expenditure increased by four per cent to £13.7bn
- Civil expenditure increased by two per cent to £11.7bn
- Defence expenditure increased by eighteen per cent to £1.9bn

R&D expenditure 1996-2003



In 2003, in real terms (2003 prices) and compared with 2002:

- Total expenditure increased by two per cent to £13.7bn
- Civil expenditure remained broadly the same at £11.7bn
- Defence expenditure increased by fifteen per cent to £1.9bn

There has been an upward trend in R&D expenditure in real terms since 1997. In cash terms, there has been an upward trend since 1992.

### Expenditure on R & D performed in UK businesses in cash & real terms 1999 to 2003

	<i>£ million</i>					<i>Percentage change</i>
	1999	2000	2001	2002	2003	2002-2003
<b>In cash terms</b>						
Civil	9,626	9,838	10,513	11,461	11,739	2
Defence	1,675	1,671	1,824	1,649	1,948	18
Total	11,302	11,510	12,336	13,110	13,687	4
<b>In real terms (2003 prices)</b>						
Civil	10,610	10,719	11,170	11,781	11,739	0
Defence	1,846	1,821	1,938	1,695	1,948	15
Total	12,457	12,540	13,107	13,476	13,687	2

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## UK Business Enterprise R&D 2003

### Expenditure on R&D performed in UK businesses: cash and real terms; 1996 to 2003 (Table 1)

In 2003, £13.7 billion was spent on R&D performed within UK businesses – a rise of 4 per cent at current prices compared with the 2002 total. Total R&D Expenditure in 2003 represented approximately 1.2 per cent of GDP, similar to in recent years.

### Expenditure on R&D performed in UK businesses: product groups, 1996 to 2003 (Table 2)

The product group with the largest R&D expenditure was pharmaceuticals: expenditure in 2003 was £3,241 million, 24 per cent of all spending. Other major product groups were aerospace accounting for £1,652 million (12 per cent) and computer and related activities £1,323 million (10 per cent).

### Sources of funds for R&D performed in UK businesses: 1996 to 2003 (Table 3 and Table 6)

Funding of R&D from businesses' 'own funds' was £7,496 million in 2003 (55 per cent of the total). Funding of R&D in UK businesses from abroad was £3,554 million in 2003 (26 per cent of the total). Funding of R&D in UK businesses by the UK Government was £1,487 million in 2003 (11 per cent of the total). The distribution of the sources of funds for business R&D in 2003 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 2003 is shown in Chart 4.

### Employment on R&D performed in UK businesses: 1996 to 2003 (Table 4)

The number of staff employed on R&D decreased by 2 per cent between 2002 and 2003 with scientists and engineers accounting for 63 per cent of the staff employed on R&D in 2003. This group has also decreased by 2 per cent since 2002. The level of technicians decreased by 11 per cent on 2002 figures and administrative staff increased 4 per cent between 2002 and 2003. This distribution is shown in Chart 2.

### **Expenditure on R&D performed in UK businesses: civil and defence, by broad product group, 1998 to 2003 (Table 5)**

In real terms, civil R&D remained broadly the same with a decrease of less than one half per cent in 2003 and defence R&D increased by 15 per cent from 2002.

In 2003, in cash terms, chemical products accounted for 32 per cent of the total civil R&D expenditure. The second largest civil R&D broad product group was services, accounting for 23 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 machinery. The distribution of civil and defence R&D expenditure by broad product groups for 2003, is shown in Chart 3.

### **Expenditure on R&D performed in UK businesses by regional breakdown: 2001 to 2003 (Table 7)**

In 2003, 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 and Eastern each accounting for 25 per cent, followed by the North West and Merseyside which accounted for 11 per cent. The regional breakdown for business R&D in 2003 is shown in Chart 5.

## **BACKGROUND NOTES**

### **The 2003 survey**

#### **Sample design**

1. The 2003 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 407 largest R&D spenders in 2003 were all sampled. These accounted for 80 per cent of the 2003 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 3,720 businesses, representing a response rate of 94 per cent.
5. Estimates were made for the R&D activity of unsampled and non-responding businesses.

#### **Revisions to past data**

6. There are no revisions to past data.

#### **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](http://www.statistics.gov.uk) on 21 January 2005.

#### **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 Julie Owens on 01633 812789, (e-mail [julie.owens@ons.gov.uk](mailto:julie.owens@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 2004.

# 1 EXPENDITURE ON R&D PERFORMED IN UK BUSINESSES: CASH AND REAL TERMS AND AS A PERCENTAGE OF GDP, 1996 TO 2003

		£million							
		1996	1997	1998	1999	2000	2001	2002	2003
In cash terms	<b>DLBX</b>	9 297	9 556	10 133	11 302	11 510	12 336	13 110	13 687
In real terms (2003 prices)		11 049	11 072	11 412	12 457	12 540	13 107	13 476	13 687
Current prices GDP	<b>DLHT</b>	773 407	822 818	868 443	919 077	961 864	1 004 082	1 057 759	1 115 890
As a % of GDP		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

2003 = 100

Source: National Statistics

	1996	1997	1998	1999	2000	2001	2002	2003
GDP deflator used to convert cash terms to real terms	84.1	86.3	88.8	90.7	91.8	94.1	97.3	100.0

## 2 EXPENDITURE ON R&D PERFORMED IN UK BUSINESSES: DETAILED PRODUCT GROUPS, 1996 TO 2003

		£million								% of total
		1996	1997	1998	1999	2000	2001	2002	2003	2003
<b>TOTAL</b>	<b>DLBX</b>	9 297	9 556	10 133	11 302	11 510	12 336	13 110	13 687	100
Agriculture, hunting and forestry; Fishing	DLBY	76	84	102	115	135	96	122	121	0.9
Extractive Industries	DLBZ	64	44	41	42	46	43	52	56	0.4
Food products and beverages; Tobacco products	DLCF	198	180	242	237	264	314	299	306	2.2
Textiles, clothing and leather products	DLCQ	27	33	33	28	29	17	19	20	0.1
Pulp, paper and paper products; Printing and publishing; Wood and straw products	DLCT	57	44	49	45	38	34	44	45	0.3
Refined petroleum products and coke oven products; Processing of nuclear fuel	DLCE	230	225	234	212	182	250	258	277	2.0
Chemicals, man-made fibres	DLCC	627	680	688	718	682	522	583	552	4.0
Pharmaceuticals, medical chemicals and botanical products	DLCD	1 852	2 151	2 238	2 535	2 846	3 040	3 304	3 241	23.7
Rubber and plastic products	DLCR	67	60	66	72	54	45	64	64	0.5
Other non-metallic mineral products	D LCS	60	47	56	59	..	41	46	48	0.4
Casting of iron and steel	DLCJ	39	39	47	41	..	31	32	29	0.2
Non-ferrous metals	DLCCK	15	15	20	22	21	19	16	6	-
Fabricated metal products	DLCCL	91	88	90	70	73	64	59	60	0.4
Machinery and equipment	DLCO	577	622	640	642	703	843	767	973	7.1
Office machinery and computers	DLCN	161	102	125	111	113	105	146	58	0.4
Electrical machinery and apparatus	DLC A	490	424	423	357	422	451	462	443	3.2
Radio, television and communication equipment	DLCB	662	655	772	867	1 024	1 044	957	948	6.9
Precision instruments	DLCM	307	336	340	473	480	488	442	400	2.9
Motor vehicles and parts	DLCG	926	924	913	1 060	864	898	929	1 173	8.6
Other transport equipment	DLCI	30	50	72	99	158	208	..	..	..
Shipbuilding and repairs	DLC H	20	15	36	76	72	83	..	..	..
Aerospace	DLCF	812	893	1 039	1 237	1 091	1 260	1 347	1 652	12.1
Furniture; Other manufactured goods	DLCU	16	25	20	33	27	31	48	68	0.5
Recycling	DLCV	1	-	-	1	1	1	3	2	-
Electricity, gas and water supply	DLCW	148	130	140	137	160	99	116	69	0.5
Construction	DLCX	8	38	39	41	34	30	35	30	0.2
Wholesale and retail trade	DLDE	..	..	..	..	..	55	69	..	..
Transport and storage	DLCY	..	..	..	..	..	12	10	..	..
Post and telecommunications	DLCZ	455	496	449	565	674	733	742	660	4.8
Miscellaneous business activities; Technical testing and analysis	DLDC	141	142	157	196	131	242	360	288	2.1
Computer and related activities	DLDB	749	680	688	713	611	725	888	1 323	9.7
Research and development services	DLDA	369	313	346	448	428	495	558	465	3.4
Public administration	DLDD	10	6	8	11	12	18	18	24	0.2

Source: National Statistics

1 .. denotes disclosive figures.

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

### 3 SOURCES OF FUNDS FOR R&D PERFORMED IN UK BUSINESSES: 1996 TO 2003

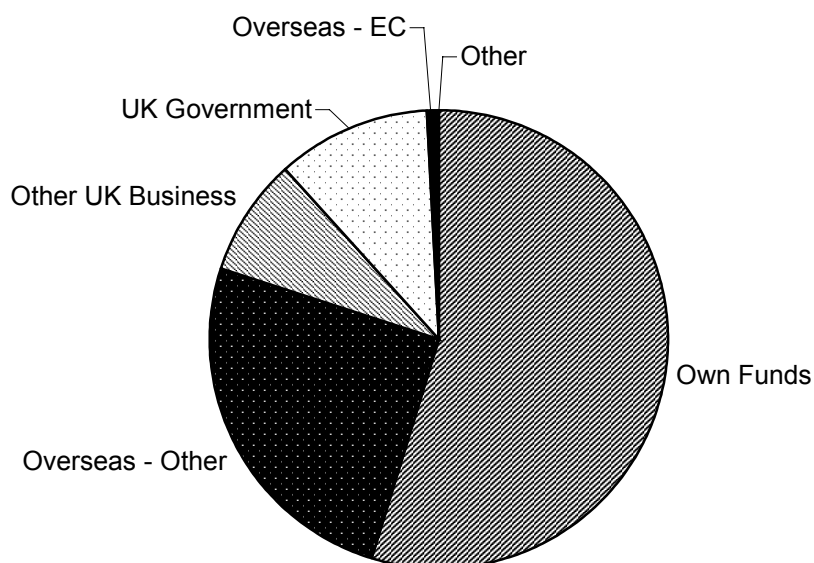
		1996	1997	1998	1999	2000	2001	2002	2003
<b>£ MILLION</b>									
<b>TOTAL</b>	<b>DLBX</b>	9 297	9 556	10 133	11 302	11 510	12 336	13 110	13 687
UK Government	<b>DLDO</b>	842	915	1 094	1 157	1 013	1 101	884	1 487
<b>Overseas total</b>	<b>DLHK</b>	2 018	1 800	2 238	2 570	2 470	3 012	3 567	3 554
of which:									
EC Programmes	<b>DLDQ</b>	131	108	119	137	101	109	177	95
All other funding from abroad	<b>DLDS</b>	1 887	1 692	2 119	2 433	2 369	2 903	3 391	3 459
Other UK Business	<b>DLDU</b>	691	642	659	750	779	764	942	1 146
Own funds	<b>DLDW</b>	5 742	6 198	6 141	6 824	7 244	7 455	7 712	7 496
Other	<b>DLDY</b>	5	1	–	1	3	4	4	3
<b>PERCENT</b>									
<b>TOTAL</b>		100	100	100	100	100	100	100	100
UK Government		9	10	11	10	9	9	7	11
<b>Overseas total</b>		22	19	22	23	21	24	27	26
of which:									
EC Programmes		1	1	1	1	1	1	1	1
All other funding from abroad		20	18	21	22	21	24	26	25
Other UK Business		7	7	7	7	7	6	7	8
Own funds		62	65	61	60	63	60	59	55
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

**Chart 1 - Sources of funds for R&D performed in UK businesses, 2003**



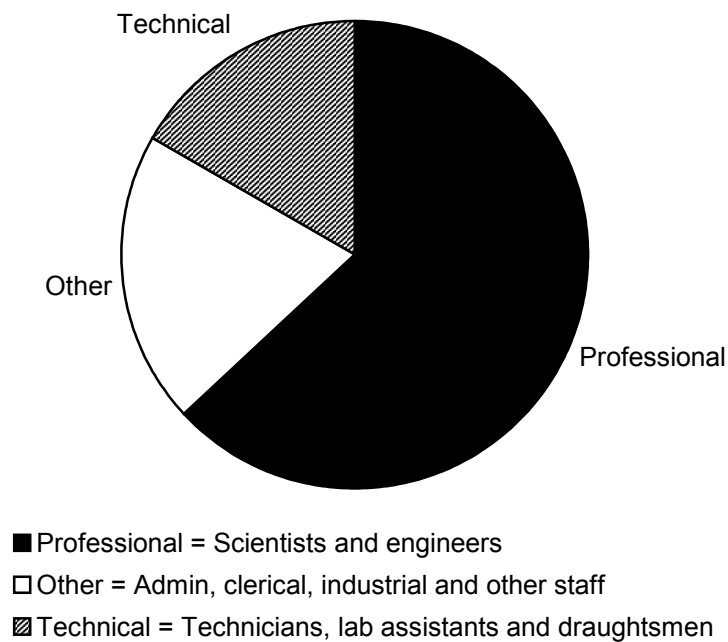
# 4 EMPLOYMENT ON R&D PERFORMED IN UK BUSINESSES: 1996 TO 2003

Full time equivalent in thousands

		1996	1997	1998	1999	2000	2001	2002	2003
<b>TOTAL</b>	<b>DLEI</b>	142	137	148	153	145	152	167	163
Scientists and engineers	<b>DLEJ</b>	82	83	91	92	86	93	105	103
Technicians, laboratory assistants and draughtsmen	<b>DLEK</b>	33	30	32	33	30	28	30	27
Administrative, clerical, industrial and other staff	<b>DLEL</b>	27	24	24	28	30	31	32	33
<b>As % of total employment</b>									
Scientists and engineers		58	61	61	60	59	61	63	63
Technicians, laboratory assistants and draughtsmen		23	22	22	22	21	18	18	17
Administrative, clerical, industrial and other staff		19	18	16	18	21	20	19	20

Source: National Statistics

**Chart 2 - Employment on R&D performed in UK businesses, 2003**



# 5 EXPENDITURE ON CIVIL AND DEFENCE R&D PERFORMED IN UK BUSINESSES: BROAD PRODUCT GROUPS, 1998 TO 2003

£million

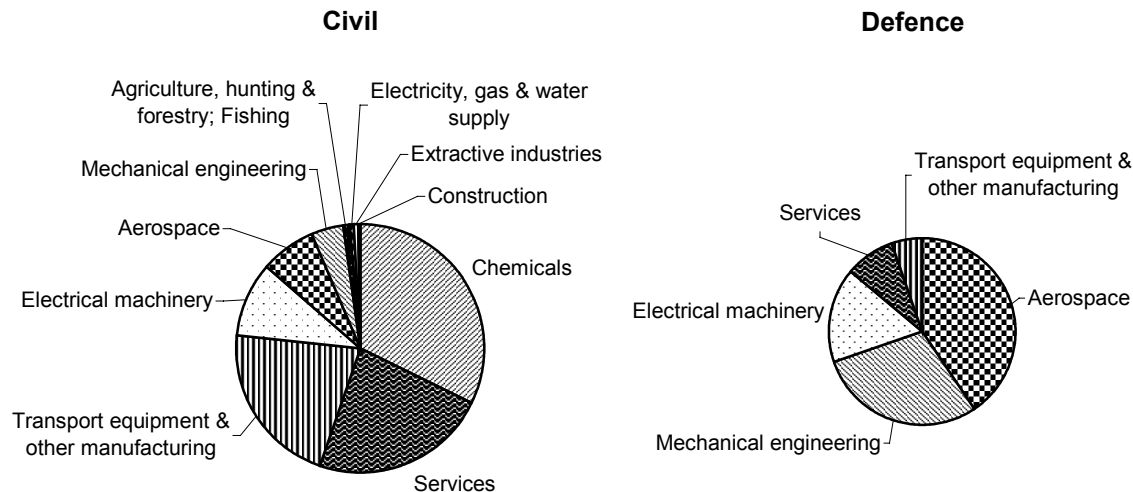
		Civil						Defence						
		1998	1999	2000	2001	2002	2003	1998	1999	2000	2001	2002	2003	
In cash terms														
<b>TOTAL</b>	<b>DLBV</b>	8 600	9 626	9 838	10 513	11 461	11 739	<b>DLBW</b>	1 533	1 675	1 671	1 824	1 649	1 948
<b>Manufacturing</b>	<b>DLEP</b>	6 725	7 376	7 582	8 089	8 626	8 754	<b>DLEX</b>	1 417	1 619	1 649	1 699	1 514	1 781
Chemicals	DLEQ	2 926	3 252	3 527	3 562	3 885	3 793	DLEY	–	1	–	–	2	–
Mechanical engineering	DLER	455	434	463	470	524	466	DLEZ	276	279	314	437	302	566
Electrical machinery	DLES	916	1 013	1 163	1 200	1 204	1 131	DLFA	404	322	395	399	361	318
Transport equipment	DLET	983	1 159	1 023	1 106	..	..	DLFB	36	77	71	82	..	..
Aerospace	DLEU	485	535	457	621	645	859	DLFC	554	701	634	639	702	792
Other manufacturing	DLEV	960	983	948	1 130	..	..	DLFD	147	239	235	141	..	..
<b>Services</b>	<b>DLEW</b>	1 552	1 915	1 883	2 155	2 511	2 709	<b>DLFE</b>	116	57	22	125	135	167
<b>Other: Total</b>	<b>LDIL</b>	322	335	374	268	324	276	<b>LDJJ</b>	–	–	–	–	–	–
Agriculture, hunting & forestry; Fishing	LDIN	102	115	135	96	122	121	LDJL	–	–	–	–	–	–
Extractive industries	LDIS	41	42	46	43	52	56	LDKF	–	–	–	–	–	–
Electricity, gas & water supply	LDJB	140	137	160	99	116	69	LDKG	–	–	–	–	–	–
Construction	LDJG	39	41	34	30	35	30	LDKS	–	–	–	–	–	–

		Civil						Defence						
		1998	1999	2000	2001	2002	2003	1998	1999	2000	2001	2002	2003	
In real terms (2003 prices)														
<b>TOTAL</b>		9 685	10 610	10 719	11 170	11 781	11 739		1 726	1 846	1 821	1 938	1 695	1 948
<b>Manufacturing</b>		7 574	8 130	8 261	8 594	8 867	8 754		1 596	1 784	1 797	1 805	1 556	1 781
Chemicals		3 295	3 584	3 843	3 785	3 993	3 793		–	1	–	–	2	–
Mechanical engineering		512	478	504	499	539	466		311	308	342	464	310	566
Electrical machinery		1 032	1 116	1 267	1 275	1 238	1 131		455	355	430	424	371	318
Transport equipment		1 107	1 277	1 115	1 175	..	..		41	85	77	87	..	..
Aerospace		546	590	498	660	663	859		624	773	691	679	722	792
Other manufacturing		1 081	1 083	1 033	1 201	..	..		166	263	256	150	..	..
<b>Services</b>		1 748	2 111	2 052	2 290	2 581	2 709		131	63	24	133	139	167
<b>Other: Total</b>		363	369	407	285	333	276		–	–	–	–	–	–
Agriculture, hunting & forestry; Fishing		115	127	147	102	125	121		–	–	–	–	–	–
Extractive industries		46	46	50	46	53	56		–	–	–	–	–	–
Electricity, gas & water supply		158	151	174	105	119	69		–	–	–	–	–	–
Construction		44	45	37	32	36	30		–	–	–	–	–	–

Source: National Statistics

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

**Chart 3 - Expenditure on civil and defence R&D performed in UK businesses, by broad product groups, 2003**



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

# 6 SOURCES OF FUNDS FOR R&D PERFORMED IN UK BUSINESSES: CIVIL AND DEFENCE, 1998 TO 2003

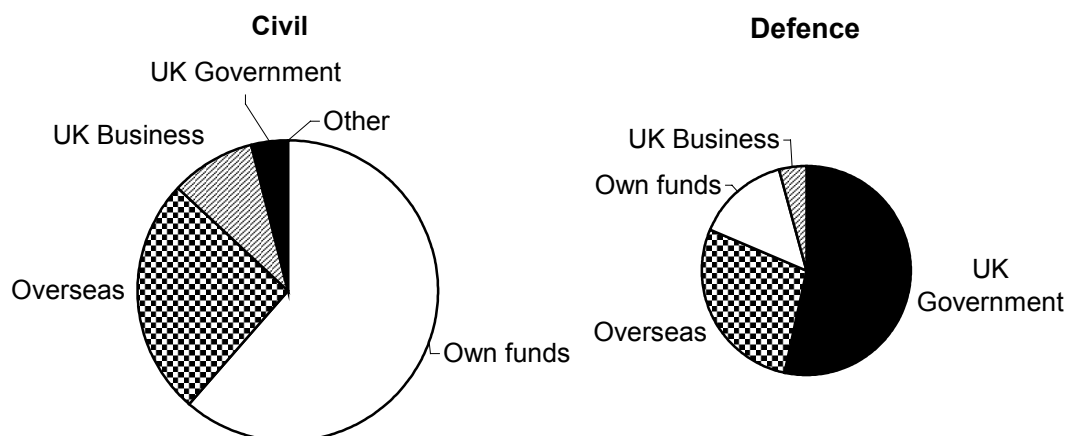
£million

		Civil						Defence						
		1998	1999	2000	2001	2002	2003	1998	1999	2000	2001	2002	2003	
UK Government	DLFG	307	316	228	191	193	447	DLFN	787	841	785	911	691	1 040
<b>Overseas total</b>	<b>DLHS</b>	<b>1 857</b>	<b>2 092</b>	<b>2 003</b>	<b>2 585</b>	<b>3 026</b>	<b>3 008</b>	<b>DLIF</b>	<b>381</b>	<b>478</b>	<b>467</b>	<b>427</b>	<b>541</b>	<b>546</b>
of which:														
EC Programmes	DLFH	119	137	101	109	177	95	DLFO	-	-	-	-	-	-
All other funding from abroad	DLFI	1 738	1 955	1 902	2 476	2 849	2 913	DLFP	381	478	467	427	541	546
Other UK Business	DLFJ	566	670	688	666	848	1 066	DLFQ	93	80	90	98	94	80
Own	DLFK	5 869	6 548	6 916	7 068	7 390	7 214	DLFR	272	276	328	387	322	282
Other	DLFL	-	1	3	4	4	3	DLFS	-	-	-	-	-	-
<b>TOTAL</b>	<b>DLBV</b>	<b>8 600</b>	<b>9 626</b>	<b>9 838</b>	<b>10 513</b>	<b>11 461</b>	<b>11 739</b>	<b>DLBW</b>	<b>1 533</b>	<b>1 675</b>	<b>1 671</b>	<b>1 824</b>	<b>1 649</b>	<b>1 948</b>

Source: National Statistics

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

**Chart 4 - Source of funds for R&D performed  
in UK businesses, civil and defence, 2003**



# 7 GOVERNMENT OFFICES REGIONAL BREAKDOWN OF R&D PERFORMED IN UK BUSINESSES: EXPENDITURE AND EMPLOYMENT, 2001 TO 2003

		Expenditure £million			% of total 2003		Employment FTE in thousands		
		2001	2002	2003			2001	2002	2003
<b>United Kingdom</b>	<b>DLBX</b>	12 336	13 110	13 687	100	<b>DLBI</b>	152	167	163
<b>England</b>	<b>DLKI</b>	11 538	12 138	12 786	93.4	<b>DLKJ</b>	139	151	149
North East	DLJO	119	128	281	2.1	DLJZ	2	3	3
North West and Merseyside	DLJT	1 512	1 661	1 559	11.4	DLKE	17	18	17
Yorkshire and Humber	DLJP	298	357	382	2.8	DLKA	6	7	6
East Midlands	DLJQ	951	1 063	929	6.8	DLKB	13	15	14
West Midlands	DLJN	662	695	587	4.3	DLJY	11	13	9
Eastern	DLJR	2 916	2 741	3 453	25.2	DLKC	29	32	37
London	DLKL	738	950	771	5.6	DLKM	9	10	9
South East	DLJS	3 317	3 268	3 464	25.3	DLKD	40	39	40
South West	DLJM	1 025	1 274	1 359	9.9	DLJX	12	14	14
<b>Wales</b>	<b>DLJU</b>	136	182	264	1.9	<b>DLKF</b>	3	3	4
<b>Scotland</b>	<b>DLJV</b>	512	640	521	3.8	<b>DLKG</b>	8	11	7
<b>Northern Ireland</b>	<b>DLJW</b>	150	149	116	0.8	<b>DLKH</b>	3	3	3

Source: National Statistics

1 FTE - Full Time Equivalents

**Chart 5 - Government Offices regional breakdown of R&D performed in UK businesses, 2003**

