

Gross domestic expenditure on reserach and development : provisional figures for 1991 / Central Statistical Office.

Contributors

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GROSS DOMESTIC EXPENDITURE ON RESEARCH AND DEVELOPMENT

PROVISIONAL FIGURES FOR 1991

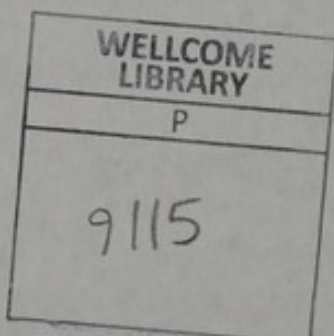
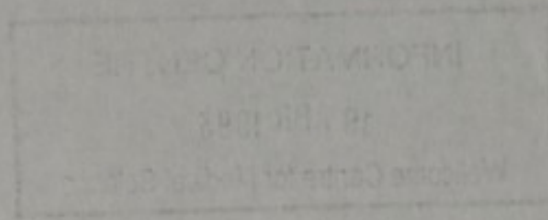
Expenditure

- * The provisional estimate of the UK's Gross domestic expenditure on R&D in 1991 was £11.9 bn compared with £12.0 bn in 1990. This represents 2.1 percent of GDP as compared with 2.2 percent in 1990.
- * R&D expenditure for civil purposes at £9.6 bn in 1991 was 2 percent higher than the figure for 1990 (£9.4 bn): R&D expenditure for defence purposes, at £2.4 bn showed a decline of 8 percent on the 1990 figure (£2.6 bn).
- * The sectors of the economy carrying out this R&D in 1991 were:
 - * **Business enterprises:** £7.8 bn compared to £8.1 bn in 1990;
 - * **Government:** £1.6 bn little changed from 1990;
 - * **Higher Education:** £1.9 bn compared to £1.8 bn in 1990;
 - * **Private non-profit:** (mainly medical charities) £0.6 bn very similar to 1990.

Funding

- * In 1991 Government funded just over a third of all R&D performed in the United Kingdom, about a quarter of the civil R&D and just under two-thirds of the defence R&D.
- * Total funding by Government for R&D (both internal and external) in 1991-92 - as shown by the survey of Government-funded R&D - is provisionally estimated at £5.3 bn (Table 4). Of this, £1.6 bn was spent within Government establishments, the remaining £3.7bn in support of R&D in other sectors in the UK and abroad.





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Table 1 R&D performed in UK in each sector according to source of finance 1991 at current prices (£m)¹ - PROVISIONAL

| Sectors providing the funds ² | Sectors carrying out the work ² | | | | | Totals | Abroad |
|--|--|------------------|---------------------|---------------------------------|--|--------------|--------|
| | Govt ³ | Higher education | Business enterprise | Private non-profit ⁴ | | | |
| Government | 1360 | 1380 | 1140 | 240 | | 4120 | 360 |
| Higher education | .. | 90 | .. | .. | | 90 | |
| Business enterprise | 190 | 160 | 5390 | 240 | | 5980 | |
| Abroad | 30 | 100 | 1240 | 20 | | 1390 | |
| Private non-profit | 60 | 210 | .. | 90 | | 360 | |
| Total | 1640 | 1940 | 7770 | 590 | | 11940 | |
| of which | | | | | | | |
| Civil | 780 | 1900 | 6300 | 580 | | 9560 | |
| Defence | 860 | 40 | 1470 | 10 | | 2380 | |

1 Research in the social sciences and humanities is included.

2 For definitions of sectors see notes.

3 The defence component of Government performed R&D has been revised downwards to take account of recent MOD studies that have indicated that 15 percent of MOD's past recorded intramural R&D expenditure lies outside the internationally accepted definition of R&D.

4 Part of this expenditure may be reclassified to the Higher Education Sector in the forthcoming Annual Review of Government Funded R&D. This would have no effect on total Gross Domestic Expenditure on R&D.

Sectors Carrying out the Work

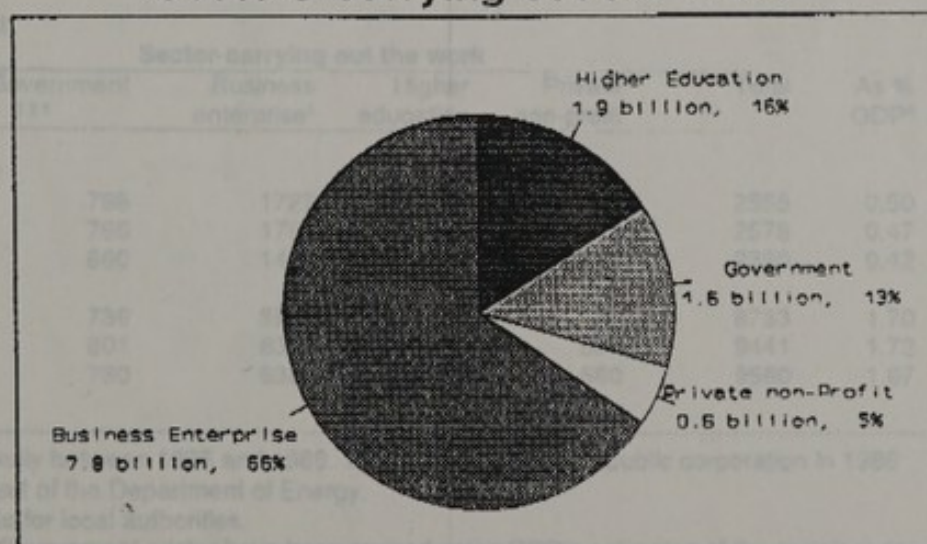


Figure 1

Table 1 R&D performed in UK in each sector according to source of finance 1997
at current prices (£m) - PROVISIONAL

| Sectors carrying out the work | | | | | |
|-------------------------------|------------------|------------------|----------------------|--------------------|---------------|
| Sectors providing the funds | Gov ² | Higher education | Business enterprises | Private non-profit | Totals Abroad |
| Government | 1350 | 1350 | 1140 | 240 | 4150 |
| Higher education | - | 50 | - | - | 50 |
| Business enterprises | 190 | 150 | 5350 | 240 | 6080 |
| Abroad | 30 | 100 | 1240 | 20 | 1390 |
| Private non-profit | 60 | 210 | - | 90 | 360 |
| Total | 1640 | 1610 | 7770 | 590 | 11940 |
| of which | | | | | |
| Civil | 780 | 1800 | 5300 | 580 | 9560 |
| Defence | 860 | 40 | 1470 | 10 | 2380 |

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Sectors Carrying out the Work

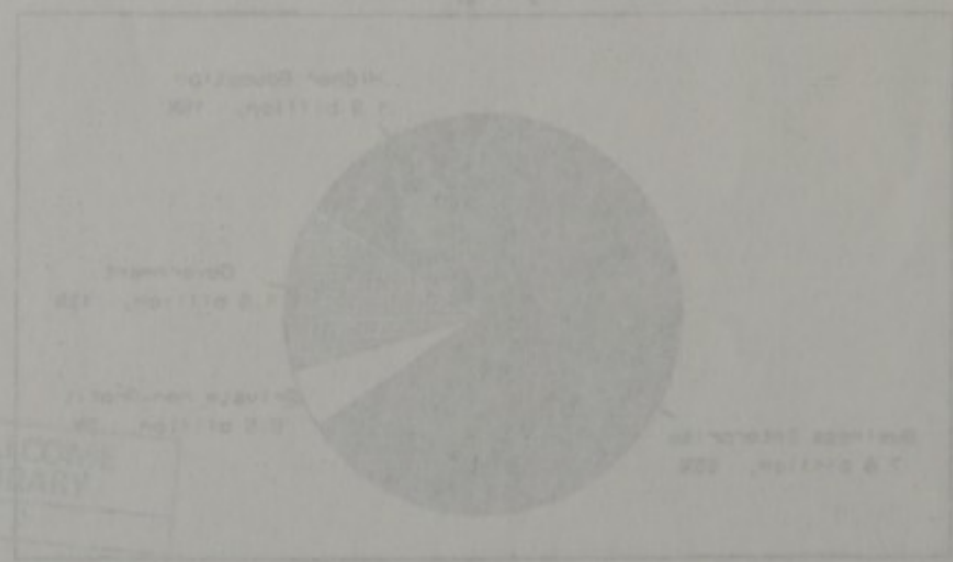


Figure 1

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Table 2 Expenditure on research and development in the UK by sector of performance 1981 to 1991 (£m)

(a) At current prices

| | Sector carrying out the work | | | | Total | As % GDP ⁴ |
|-------------------|------------------------------|-------------------------------------|---------------------|-----------------------|-------|-----------------------|
| | Government 123 | Business enterprise ¹ | Higher education | Private non-profit | | |
| 1981 | 1243 | 3792 | 816 | 170 | 6021 | 2.37 |
| 1983 | 1357 | 4163 | 950 | 194 | 6664 | 2.20 |
| 1985 | 1440 | 5122 | 1174 | 272 | 8008 | 2.25 |
| 1986 | 1207 | 5951 | 1281 | 336 | 8775 | 2.29 |
| 1987 | 1264 | 6335 | 1403 | 350 | 9352 | 2.21 |
| 1988 | 1360 | 6922 | 1515 | 410 | 10207 | 2.17 |
| 1989 | 1534 | 7650 | 1622 | 482 | 11288 | 2.20 |
| 1990 | 1567 | 8099 | 1790 | 562 | 12019 | 2.19 |
| 1991 ^p | 1640 | 7770 | 1940 | 590 | 11940 | 2.09 |

(b) At 1985 prices⁵

| | Sector carrying out the work | | | | Total | |
|-------------------|------------------------------|-------------------------------------|---------------------|-----------------------|-------|--|
| | Government 123 | Business enterprise ¹ | Higher education | Private non-profit | | |
| 1981 | 1544 | 4710 | 1013 | 211 | 7478 | |
| 1983 | 1504 | 4613 | 1053 | 215 | 7384 | |
| 1985 | 1440 | 5122 | 1174 | 272 | 8008 | |
| 1986 | 1169 | 5765 | 1241 | 325 | 8501 | |
| 1987 | 1161 | 5818 | 1288 | 321 | 8588 | |
| 1988 | 1164 | 5925 | 1297 | 351 | 8737 | |
| 1989 | 1232 | 6145 | 1303 | 387 | 9067 | |
| 1990 | 1165 | 6023 | 1331 | 418 | 8938 | |
| 1991 ^p | 1143 | 5417 | 1353 | 411 | 8325 | |

(c) Civil/defence split

| | Sector carrying out the work | | | | Total | As % GDP ⁴ |
|-------------------|------------------------------|-------------------------------------|---------------------|-----------------------|-------|-----------------------|
| | Government 123 | Business enterprise ¹ | Higher education | Private non-profit | | |
| Defence | | | | | | |
| 1989 | 798 | 1727 | 25 | 5 | 2555 | 0.50 |
| 1990 | 766 | 1761 | 40 | 11 | 2578 | 0.47 |
| 1991 ^p | 860 | 1470 | 40 | 10 | 2380 | 0.42 |
| Civil | | | | | | |
| 1989 | 736 | 5923 | 1597 | 477 | 8733 | 1.70 |
| 1990 | 801 | 6339 | 1750 | 551 | 9441 | 1.72 |
| 1991 ^p | 780 | 6300 | 1900 | 580 | 9560 | 1.67 |

1 There is a discontinuity between 1985 and 1986. The UKAEA became a public corporation in 1986 and ceased to be part of the Department of Energy.

2 Includes an estimate for local authorities.

3 The figures for the Government sector have been revised using CSO's estimates of the revisions to MOD figures (see Note 3, Table 1).

4 GDP = gross domestic product at market prices as in the UN definition.

5 Using the adjusted GDP deflator (See notes to editors).

p = provisional

Table 2 Expenditure on research and development in the UK by sector of performance 1981 to 1997 (bn)

(a) At current prices

| | Sector carrying out the work | | | | As % GDP |
|------|------------------------------|---------------------|------------------|--------------------|----------|
| | Government | Business enterprise | Higher education | Private non-profit | Total |
| 1981 | 1648 | 1770 | 1840 | 830 | 7188 |
| 1982 | 1807 | 2009 | 1790 | 862 | 7568 |
| 1983 | 1887 | 2090 | 1832 | 882 | 7691 |
| 1984 | 1940 | 2122 | 1874 | 908 | 7844 |
| 1985 | 1907 | 2061 | 1881 | 928 | 7776 |
| 1986 | 1834 | 2038 | 1909 | 920 | 7691 |
| 1987 | 1780 | 2022 | 1918 | 910 | 7630 |
| 1988 | 1824 | 2090 | 1932 | 882 | 7728 |
| 1989 | 1807 | 2009 | 1790 | 862 | 7568 |
| 1990 | 1848 | 2170 | 1840 | 830 | 7688 |

(b) At 1992 prices

| | Sector carrying out the work | | | | Total |
|------|------------------------------|---------------------|------------------|--------------------|-------|
| | Government | Business enterprise | Higher education | Private non-profit | Total |
| 1981 | 1644 | 1710 | 1818 | 811 | 7083 |
| 1982 | 1804 | 2013 | 1838 | 878 | 7533 |
| 1983 | 1884 | 2122 | 1874 | 908 | 7788 |
| 1984 | 1940 | 2122 | 1874 | 908 | 7844 |
| 1985 | 1907 | 2061 | 1881 | 928 | 7776 |
| 1986 | 1834 | 2038 | 1909 | 920 | 7691 |
| 1987 | 1780 | 2022 | 1918 | 910 | 7630 |
| 1988 | 1824 | 2090 | 1932 | 882 | 7728 |
| 1989 | 1807 | 2009 | 1790 | 862 | 7568 |
| 1990 | 1848 | 2170 | 1840 | 830 | 7688 |

(c) Constant price

| | Sector carrying out the work | | | | As % GDP |
|------|------------------------------|---------------------|------------------|--------------------|----------|
| | Government | Business enterprise | Higher education | Private non-profit | Total |
| 1981 | 1648 | 1770 | 1840 | 830 | 7188 |
| 1982 | 1807 | 2009 | 1790 | 862 | 7568 |
| 1983 | 1887 | 2090 | 1832 | 882 | 7691 |
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| 1986 | 1834 | 2038 | 1909 | 920 | 7691 |
| 1987 | 1780 | 2022 | 1918 | 910 | 7630 |
| 1988 | 1824 | 2090 | 1932 | 882 | 7728 |
| 1989 | 1807 | 2009 | 1790 | 862 | 7568 |
| 1990 | 1848 | 2170 | 1840 | 830 | 7688 |

- 1 There is a discontinuity between 1988 and 1989. The UKAEA became a public corporation in 1988 and ceased to be part of the Government of Energy.
- 2 Includes an estimate for non-commercial.
- 3 The figures for the Government sector have been revised using GPO's estimates of the revision to RPI-X (see Table 2, Table 1).
- 4 GDP - Gross domestic product at market prices as in the UK definition.
- 5 Using the adjusted GDP deflator (see notes to Table 1).
- 6 - Provisional.

Table 3 Expenditure on research and development in the UK by sector of funding 1981 to 1991

| Sector funding the R&D | As a percentage of total | | | | | | | | | |
|------------------------|--------------------------|-------|---------|-------|---------|-------|-------|---------|-------|---------|
| | 1981 | | | | | 1991 | | | | |
| | Total | Civil | Defence | Total | Defence | Total | Civil | Defence | Total | Defence |
| Government | 49 | 50 | 43 | 36 | 26 | 69 | 36 | 27 | 35 | 27 |
| Business | 41 | 42 | 46 | 51 | 60 | 19 | 49 | 59 | 50 | 57 |
| Higher education |) |) | (| 1 | 1 | .. | 1 | 1 | 1 | 1 |
| Abroad | 10 | 8 | (| 8 | 10 | 11 | 11 | 10 | 12 | 11 |
| Private non-Profit |) |) | (| 2 | 3 | 1 | 3 | 3 | 3 | 3 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

See notes 1 to 2 at Table 2.

Table 4 Gross central government expenditure on R&D 1981-82 to 1991-92**NOTES TO EDITORS**

| | 1981-82 | 1985-86 | 1989-90 | 1990-91 | 1991-92 ^p |
|--------------------------------|-------------|-------------|-------------|-------------|----------------------|
| At current prices (£m): | | | | | |
| Internal ¹ | 1243 | 1440 | 1524 | 1556 | 1630 |
| External ² | 2360 | 3150 | 3317 | 3518 | 3720 |
| Total gross | 3603 | 4590 | 4841 | 5074 | 5350 |

At 1985 prices (£m):³

| | | | | | |
|-----------------------|-------------|-------------|-------------|-------------|-------------|
| Internal ¹ | 1544 | 1440 | 1224 | 1157 | 1136 |
| External ² | 2931 | 3150 | 2664 | 2616 | 2594 |
| Total gross | 4475 | 4590 | 3888 | 3773 | 3730 |

As % total gross:

| | | | | | |
|-----------------------|------------|------------|------------|------------|------------|
| Internal ¹ | 34 | 31 | 31 | 31 | 30 |
| External ² | 66 | 69 | 69 | 69 | 70 |
| Total gross | 100 | 100 | 100 | 100 | 100 |

1 Internal data have been revised downwards to take account of recent MOD studies. (See note 3, Table 1)

2 Including work performed overseas.

3 Using the adjusted GDP deflator (See notes to editors).

p = provisional

Classifications of Sectors

The OECD terminology is used. "Government" corresponds to the "General government" sector of the UK National Accounts and includes local as well as central government. "Business enterprise" (previously called "Industry")

Table 4 Gross central government expenditure on R&D 1981-82 to 1997-98

| | | 1981-82 | 1982-83 | 1983-84 | 1984-85 | 1985-86 |
|-----------------------------------|-----------------------|---------|---------|---------|---------|---------|
| At current prices (£m): | Internal ¹ | 1243 | 1440 | 1854 | 1858 | 1830 |
| | External ² | 2380 | 3150 | 3317 | 3518 | 3750 |
| Total gross | | 3623 | 4590 | 4841 | 5074 | 5350 |
| | | | | | | |
| At 1985 prices (£m): ³ | Internal ¹ | 1844 | 1440 | 1224 | 1157 | 1135 |
| | External ² | 2331 | 3150 | 2884 | 2818 | 2594 |
| Total gross | | 4175 | 4590 | 3888 | 3773 | 3730 |
| | | | | | | |
| As % total gross: | | | | | | |
| Internal ¹ | Internal ¹ | 34 | 31 | 31 | 31 | 30 |
| | External ² | 56 | 59 | 69 | 69 | 70 |
| Total gross | | 100 | 100 | 100 | 100 | 100 |

- 1 Internal data have been revised downwards to take account of recent MOD studies. (See note 3.)
 2 Including work performed overseas.
 3 Using the adjusted GDP deflator (CPI notes to editors).
 p = provisional

NOTES TO EDITORS

The Central Statistical Office publishes today the provisional figures for Gross domestic expenditure on Research and Development (GERD) for 1991. Final figures will be published by the Office of Science and Technology in the Annual Review of Government Funded Research and Development in Summer 1993.

Revisions to figures

The tables include revisions to the data as the result of an exercise which MOD has conducted into the expenditure on Research and Development performed within the department (intramural expenditure). The results indicated that, in the past, about 15 percent of MOD's recorded intramural expenditure lay outside the internationally accepted definitions of R&D. The figures for expenditure on R&D performed within the Government sector have been revised to take account of this.

Deflators

Current price figures have been converted into real terms using the adjusted GDP deflator, produced by the CSO. For money GDP as actually measured and published by the CSO in National Accounts data there is a discontinuity in the series associated with the change from domestic rates, which were included within GDP, to the community charge, which is not. In order to allow consistent comparisons of expenditure as a proportion of GDP, the CSO has produced an adjusted GDP deflator for the years up to 1989-90 which is on a consistent basis with the figures for 1990-91 onwards.

Sources

There are two annual CSO surveys of R&D statistics. One is addressed to all government departments, the other to enterprise groups performing R&D in industry. Full details of the survey of government R&D will be published this summer by the OST in the Annual Review of Government Funded Research and Development. Every four years CSO conducts a benchmark survey of business R&D. The last such survey was in respect of 1989 and for the first time requested separate civil and defence returns for expenditure, funding and employment. There is an annual sample survey in between benchmark surveys. Details of the 1991 survey results were published in CSO bulletin 7/93 on 25 January 1993.

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corresponds to the "Corporate" sector and includes public corporations and research associations as well as commercial and industrial companies.

"Private non-profit" (previously called "other") corresponds to the "Personal" sector of the National Accounts, except that higher education institutes are excluded and put into a separate OECD sector ("Higher Education"). "Abroad" was previously called "Overseas".

Gross domestic expenditure on R&D (GERD)

Gross domestic expenditure on R&D (GERD) is a measure commonly used for international comparisons. It covers all R&D performed in the country concerned, including that funded from abroad, but excludes R&D performed abroad. The four components of GERD relate to R&D performed in the four sectors of the economy:

a. Government R&D is based on the returns of intramural R&D in the CSO Government survey but includes an estimate for R&D performed by local authorities.

b. Business enterprise R&D is derived from the results of the CSO survey of business enterprise R&D.

c. Higher Education R&D is estimated by the Higher Education Funding Council, using assumptions about the proportion of general funding directed to R&D.

d. Private non-profit R&D is partly derived from the survey of government-funded R&D and partly estimated by the CSO.

In addition to being analysed by sector of performance, GERD may be analysed by sector of funding. The R&D performed by any one sector of the economy can be funded by any of the other sectors or by the performing sector itself.

The figures for R&D performed by Government and Business enterprises may be considered more robust than the other GERD components, since they are based on survey results.

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