Economic Trends

No 478
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Contents

Introduction

Economic Trends brings together all the main economic indicators. It contains three regular sections of tables and charts illustrating trends in the UK economy.

'Economic Update' is a feature giving an overview of the latest economic statistics. The content and presentation will vary from month to month depending on topicality and coverage of the published statistics. The accompanying table on main economic indicators is wider in coverage than the table on selected monthly indicators appearing in previous editions of *Economic Trends*. Data included in this section may not be wholly consistent with other sections which will have gone to press earlier.

The main section is based on information available to the CSO on the date printed at the foot of this page and shows the movements of the key economic indicators. The indicators appear in tabular form on left hand pages with corresponding charts on facing right hand pages. Colour has been used to aid interpretation in some of the charts, for example by creating a background grid on those charts drawn to a logarithmic scale. Index numbers in some tables and charts are given on a common base year for convenience of comparison.

The section on cyclical indicators shows the movements of four composite indices over 20 years against a reference chronology of business cycles. The indices group together indicators which lead, coincide with and lag behind the business cycle, and a short note describes their most recent movements. The March, June, September and December issues carry further graphs showing separately the movements in all of the 27 indicators which make up the composite indices.

An article on international economic indicators appears monthly. Occasional articles comment on and analyse economic statistics and introduce new series, new analyses and new methodology.

Quarterly articles on the national accounts and the balance of payments appear in a separate supplement to *Economic Trends* entitled *UK Economic Accounts* which is published every January, April, July and October.

Economic Trends is prepared monthly by the Central Statistical Office in collaboration with the statistics divisions of Government Departments and the Bank of England.

Notes on the tables

1. Some data, particularly for the latest time period, are provisional and may be subject to revisions in later issues.

2. The statistics relate mainly to the United Kingdom; where figures are for Great Britain only, this is shown on the table.

3. Almost all quarterly data are seasonally adjusted; those not seasonally adjusted are indicated by NSA.

4. Rounding may lead to inconsistencies between the sum of constituent parts and the total in some tables.

5. A line drawn across a column between two consecutive figures indicates that the figures above and below the line have been compiled on different bases and are not strictly comparable. In each case a footnote explains the difference.

6. 'Billion' denotes one thousand million.

7. There may sometimes be an inconsistency between a table and the corresponding chart, because the data may be received too late to update the chart. In such cases it should be assumed that the table is correct.

8. There is no single correct definition of *money*. Consequently, several definitions of money stock are widely used:

M0 the narrowest measure consists of notes and coin in circulation outside the Bank of England and bankers' operational deposits at the Bank.

M2 comprises notes and coin in circulation with the public *plus* sterling retail deposits held by the UK private sector with UK banks and building societies.

M4 comprises notes and coin in circulation with the public, together with all sterling deposits (including *certificates of deposit*) held with UK banks and building societies by the rest of the private sector.

The Bank of England also publish data for liquid assets outside M4.

9. Symbols used:
   .. not available
   - nil or less than half the final digit shown
   + alongside a heading indicates a series for which measures of variability are given in the table on page 82
   † indicates that the data has been revised since the last edition; the period marked is the earliest in the table to have been revised
   * average (or total) of five weeks.

The Editor would welcome readers' suggestions for improvements to *Economic Trends*.

Central Statistical Office, 16 August 1993

CSO Databank

The data in this publication can be obtained in computer readable form via the CSO Databank service which provides macro-economic times series data on magnetic tape and High Density floppy disk. For more details about availability and prices, or to place your order you can telephone, write or fax to: Databank Marketing, Room 56/5, Central Statistical Office, Government Buildings, GreatGeorge Street, London, SW1P 3AQ (telephone: 071 270 6081 , fax: 071 270 6019). For further information on the CSO Databank content and technical details you can telephone or write to: The Databank Service, Room 52/4, Central Statistical Office, Great George Street, London SW1P 3AQ (telephone: 071 270 6386 or 6387). The CSO does not offer direct on-line access for these data, but a list of host bureaux offering such a facility is available on request from the CSO.

ECONOMIC UPDATE - August 1993

(includes data up to 20 August 1993)

Summary

- **Gross domestic product** at constant factor cost, rose by 0.5 per cent between 1993 Q1 and 1993 Q2. Excluding oil and gas extraction it also rose by 0.5 per cent.

- **UK claimant unemployment**, seasonally adjusted, rose very slightly in July, having fallen in the previous five months.

- **Manufacturing output** rose by 1.4 per cent between 1993 Q1 and 1993 Q2.

- **Retail sales volume** rose by 0.7 per cent in the three months to July compared with the previous three months.

- The **retail prices index** rose by 1.4 per cent in the year to July. **Excluding mortgage interest payments**, the 12-month rate rose from 2.8 per cent in June to 2.9 per cent in July.

- **Output prices for manufactured products**, excluding food, beverages, tobacco and petroleum, rose by 2.5 per cent in the year to July, the same as the rise in the year to June. The annual increase in **input prices for manufacturing industry** fell from 7.0 per cent in June to 6.6 per cent in July.

- In 1993 Q2, **manufacturing productivity** was 8.2 per cent higher than one year earlier. Over the same period **unit wage costs** fell by 3.0 per cent.

- Annual growth in **whole economy underlying average earnings** for Great Britain continued to fall; from $3^3/_4$ per cent in May to $3^1/_2$ per cent in June.

- Annual growth of **M0**, seasonally adjusted, rose from 4.4 per cent in June to 4.8 per cent in July.

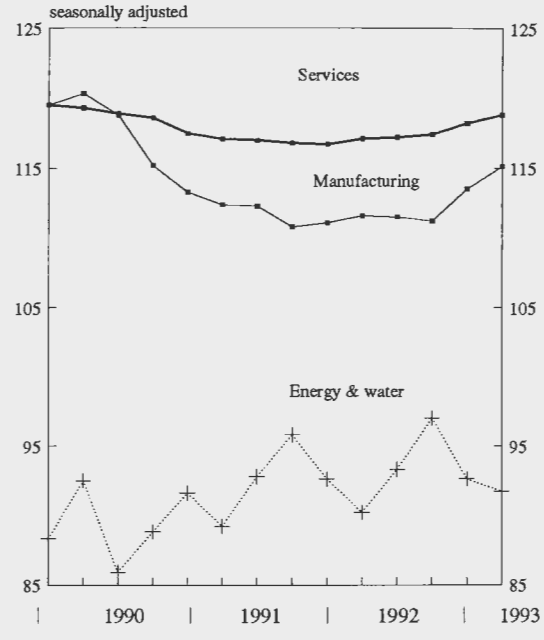
Output

The latest estimate of **Gross domestic product (GDP)**, at constant factor cost, shows a rise of 0.5 per cent between 1993 Q1 and 1993 Q2 and a rise of 1.5 per cent in the year to 1993 Q2. Excluding oil and gas extraction, **GDP** also rose by 0.5 per cent between 1993 Q1 and 1993 Q2 and by 1.3 per cent in the year to 1993 Q2.

2. The **index of industrial production**, seasonally adjusted, fell by 0.5 per cent between May and June. The lateness of the Spring bank holiday in 1993 inflated manufacturing production in May at the expense of June. In 1993 Q2 it was 0.8 per cent higher than 1993 Q1 and 2.8 per cent higher than 1992 Q2. **Manufacturing output** rose by 1.4 per cent in 1993 Q2 compared with 1993 Q1 and **energy output** fell by 1.0 per cent.

3. **Services' output** rose by 0.5 per cent between 1993 Q1 and 1993 Q2. Within this, output of distribution, hotels and catering and other services both rose by 0.6 per cent; output for transport and communication fell by -0.1 per cent . The growth of the output constituents of GDP are shown in Chart 1.

Chart 1
Output constituents of GDP



Activity and expectations

4. The CSO's **coincident cyclical indicator** has risen since the spring of last year, when it is provisionally estimated to have turned up. The **shorter leading index** is sustaining the rise started in the autumn of last year. Incomplete information suggests that the **longer leading index** may be levelling off.

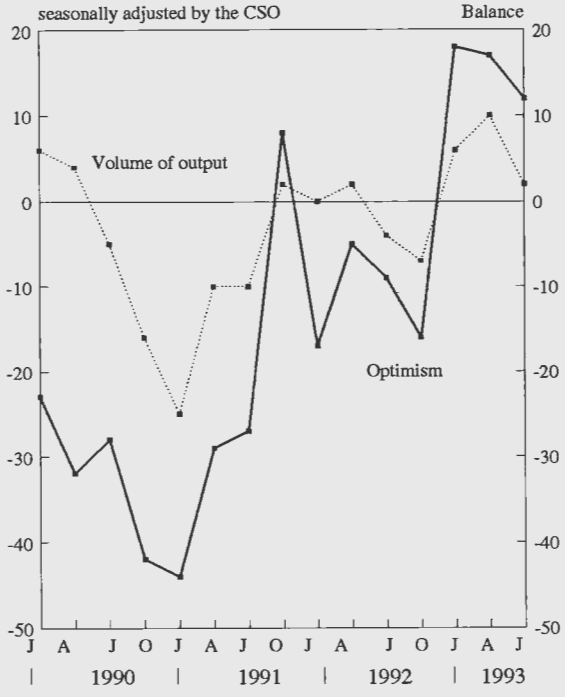
5. The **CBI Quarterly Industrial Trends Survey** of manufacturing showed a fall in the 'optimism' balance (those more optimistic minus those less), seasonally adjusted by the CSO, from 17 per cent in April to 12 per cent in July. The percentage balance of firms expecting rises in output over the next four months, seasonally adjusted by the CSO, fell from 10 per cent in April to 2 per cent in July. Recent balances are plotted in Chart 2.

Indicators of domestic demand

6. **Consumers' expenditure** rose by 0.5 per cent between 1993 Q1 and 1993 Q2 and by 1.9 per cent in the year to 1993 Q2. Gross domestic fixed capital formation fell by 0.7 per cent and general government final consumption rose by 1.1 per cent.

7. More timely, monthly, data shows a fall in the **volume of total retail sales**, seasonally adjusted, in July of 0.2 per cent. This fall resulted largely from reduced sales by clothing and footwear retailers following a sharp rise in June. Sales of goods by mixed retail businesses and by retailers of

Chart 2
CBI optimism and output expectations



household goods rose. In the three months to July the volume of retail sales was up by 0.7 per cent on the previous three months and 3.6 per cent up on the same period a year ago.

8. **Net lending to consumers**, on the broader coverage, rose from £299 million in 1993 Q1 to £616 million in 1993 Q2. On the narrower coverage, available monthly, figures also show a rise in lending - from £400 million in 1993 Q1 to £525 million in 1993 Q2. Chart 3 shows the continuing rise in net lending to consumers on the broader coverage.

Prices and wages

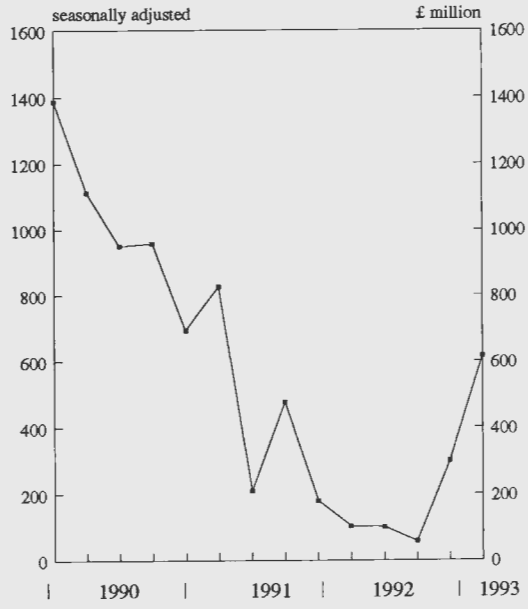
9. The implied **GDP deflator at factor cost** rose by 0.6 per cent between 1993 Q1 and 1993 Q2 and by 1.1 per cent in the year to 1993 Q2.

10. In the year to July, the increase in the **retail prices index** (RPI) was 1.4 per cent, up from 1.2 per cent for the year to June. This rise in the 12-month rate was mainly due to a smaller fall in food prices than a year ago. **Excluding mortgage interest payments**, the 12-month rate rose from 2.8 per cent in June to 2.9 per cent in July, well within the government's target range of 1-4 per cent.

11. The **output price index for manufactured products** (home sales), seasonally adjusted and excluding food, beverages, tobacco and petroleum, rose by 0.3 per cent between June and July. The annual rise in the index remained at 2.5 per cent in July.

12. The **input price index for materials and fuel purchased by manufacturing industry**, seasonally adjusted, remained unchanged between June and July. The annual increase in the

Chart 3
Net lending to consumers
(broader coverage)



index fell from 7.0 per cent in June to 6.6 per cent in July. The rise in the index in the year to July is less than might have been expected following the fall in sterling's effective exchange rate of 11.6 per cent over the same period. Movements in output and input prices for the manufacturing industry since 1990 are shown in Chart 4.

13. **Output price expectations** reveal little inflationary pressure. The CBI Quarterly Industrial Trends Survey of manufacturing in July implied a balance, seasonally adjusted by the CSO, of 2 per cent of firms (ups less downs) expecting to raise prices in the next four months.

14. The annual rise in underlying **whole economy average earnings** for Great Britain fell from $3^3/_4$ per cent in May to $3^1/_2$ per cent in June. The underlying increase for manufacturing remained at 5 per cent while for services it fell from 3 per cent to $2^3/_4$ per cent.

Labour market and productivity

15. **UK claimant unemployment**, seasonally adjusted, rose in the month to July by just 200 to remain at 2.912 million, or 10.4 per cent of the workforce; the first rise in six months. The average monthly fall in the six months to July was 13,400, whilst in the latest three months there was an average monthly fall of about 9,200.

16. The **number of employees in manufacturing** in Great Britain rose by 16,000 between May and June. Recent upward revisions to figures have resulted in the rise of 11,000 between 1992 Q4 and 1993 Q1 being followed by a rise of 10,000 between 1993 Q1 and 1993 Q2.

Chart 4
Producer price indices

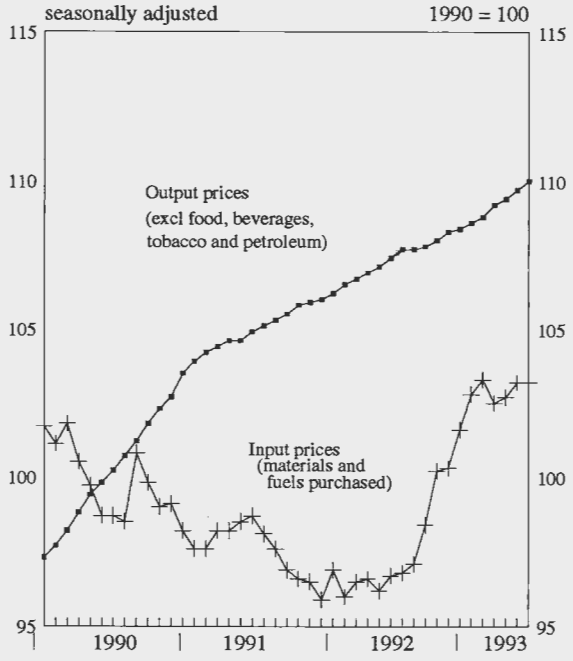
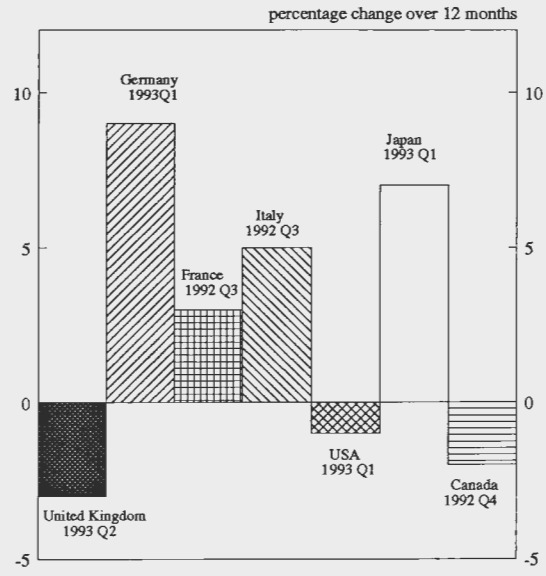


Chart 5
Wage costs per unit
of manufacturing output



17. In 1993 Q2 **labour productivity in manufacturing** was 8.2 per cent above the same period last year. Over the same period **unit wage costs in manufacturing** fell by 3.0 per cent, as a result of subdued earnings growth and a rapid rise in labour productivity. Chart 5 shows an international comparison of the most recent available data on unit wage costs.

Monetary indicators

18. The annual growth of narrow money (**M0**), seasonally adjusted, rose from 4.4 per cent in June to 4.8 per cent in July; outside the Government's monitoring range of 0-4 per cent. The annual growth of broad money (**M4**) rose provisionally to 3.6 per cent in July; within the monitoring range of 3-9 per cent.

Government finances

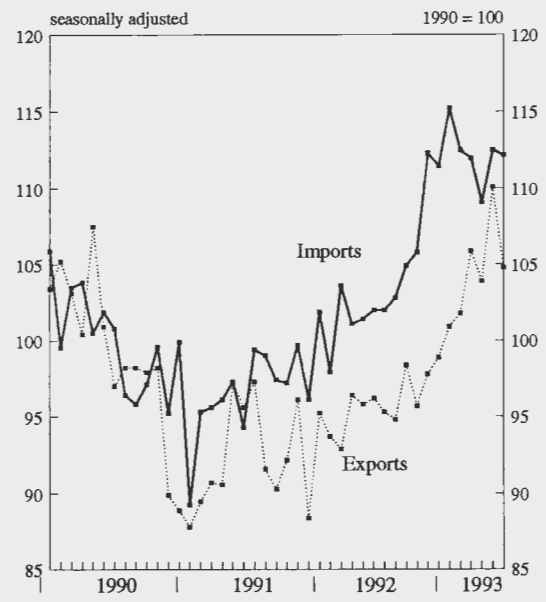
19. The **public sector borrowing requirement (PSBR)** in July was £1.5 billion. Excluding privatisation proceeds of £1.8 billion from the sale of the third tranche of BT, the PSBR was £3.3 billion. In the first four months of 1993-94 the **PSBR** was £14.9 billion compared with £11.4 billion in the same period last year. Excluding privatisation proceeds the figures were £18.2 billion and £14.8 billion respectively. In the first four months of 1993-94 central government receipts rose by 4 per cent and outlays rose by $7^1/_2$ per cent, compared to the same period last year.

Balance of payments

20. Figures on trade with non-EC countries reveal that the visible deficit widened in July to £778 billion, which resulted in a flattening of the upward trend in the visible balance. **Export volumes, excluding oil and erratics**, rose by 2.2 per cent in the three months to July. On the same basis **imports** rose by 0.4 per cent. Chart 6 shows recent movements in import and export volumes, excluding oil and erratics.

21. In the three months to July, the **unit value of non-EC exports, excluding oil**, rose by 0.2 per cent compared with the three previous months. On the same basis the **unit value of non-EC imports**, rose by 0.6 per cent. The **non-EC terms of trade** worsened by 0.4 per cent.

Chart 6
Volume of exports and imports
(excluding oil and erratics)



INTERNATIONAL ECONOMIC INDICATORS

INTRODUCTION

The series presented here are taken from the Organisation of Economic Co-operation and Development's (OECD) Main Economic Indicators, except for the United Kingdom where several of the series are those most recently published. The series shown are for each of the G7 economies (United Kingdom, Germany, France, Italy, United States, Japan and Canada) and for the European Communities (EC) and OECD countries in aggregate. The data are those available at 19 August 1993.

2. The length and periodicity of the series have been chosen to show their movement over a number of years as well as the recent past. There is no attempt here to make cross country comparisons across cycles. Further, because the length and timing of these cycles varies across countries, comparisons of indicators over the same period should be treated with caution.

COMMENTARY

3. Gross Domestic Product (GDP) at constant market prices continued to rise in the United States continued its rise in the second quarter of this year at a slightly faster rate than the previous quarter. In the United Kingdom also, GDP continued to rise - at 0.5 per cent in the second quarter, the same as it was in the previous quarter. Elsewhere in Europe, there were falls in GDP in 1993 Q1 in France, Italy and Germany - the latter experienced its fourth successive quarterly fall.

4. The annual rate of increase in consumer prices rose in all the main EC countries for the months from June to July. The rate in the United Kingdom rose from 1.2 per cent to 1.4 per cent, while in France the rate moved up from 1.9 per cent to 2.1 per cent, and in Italy it increased from 4.1 per cent to 4.4 per cent. In Japan the rate rose from 0.9 per cent to 1.7 per cent while in the United States it fell to 2.8 per cent.

5. The standardised unemployment rate in the United Kingdom remained at 10.4 per cent in June. Elsewhere in Europe in May it rose slightly in Germany and France. The rate for the United States rose slightly to 6.9 per cent in June. That for Canada remained at 11.3 per cent.

1 Gross domestic product at constant market prices: index numbers

1985 = 100

	United Kingdom	Germany[1]	France	Italy	EC	United States	Japan[2]	Canada	Major 7	OECD
	FNAO	GABI	GABH	GABJ	GAEK	GAEH	GAEI	GAEG	GAEO	GAEJ
1980	90.5	94.6	92.7	93.3	93.0	88.2	82.9	86.7	88.7	88.9
1985	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1986	104.1	102.2	102.5	102.9	102.8	102.9	102.6	103.3	102.9	102.9
1987	109.1	103.6	104.8	106.1	105.8	106.1	107.1	107.6	106.2	106.3
1988	114.0	107.3	109.5	110.5	110.2	110.3	113.8	113.0	111.0	110.9
1989	116.4	111.0	114.2	113.7	114.0	113.0	119.3	115.7	114.4	114.5
1990	117.0	116.8	117.1	116.1	117.2	114.0	125.0	115.6	116.8	117.1
1991	114.4	121.2	117.9	117.6	118.7	112.6	130.0	113.6	117.3	117.7
1992	113.7	122.6	119.6	118.7	119.4	115.0	132.0	114.4	119.1	119.4
1990 Q1	117.9	114.7	116.5	115.7	116.4	114.3	122.6	116.4	116.4	116.6
Q2	118.2	115.8	117.0	115.6	117.1	114.6	124.6	116.0	117.0	117.2
Q3	116.5	117.9	117.6	116.9	117.7	114.1	125.9	115.5	117.1	117.4
Q4	115.3	118.9	117.3	116.4	117.8	112.9	127.1	114.3	116.7	117.2
1991 Q1	114.9	120.5	117.0	117.0	118.1	112.1	129.1	112.5	116.7	117.1
Q2	114.1	121.6	117.6	117.4	118.6	112.6	129.9	113.7	117.2	117.6
Q3	114.4	121.5	118.5	117.7	118.9	112.9	130.5	114.0	117.6	117.9
Q4	114.2	121.3	118.6	118.3	119.2	113.1	131.1	114.2	117.8	118.2
1992 Q1	113.5	123.3	119.6	119.0	119.7	113.9	132.5	114.2	118.7	119.0
Q2	113.4	123.0	119.7	119.0	119.5	114.3	132.5	114.2	118.8	119.2
Q3	113.8	122.6	119.7	118.6	119.4	115.3	131.7	114.3	119.1	119.5
Q4	114.2	121.5	119.3	118.1	119.1	116.6	131.7	115.0	119.7	119.9
1993 Q1	114.7	119.8	118.8	118.0	..	116.8	132.5	116.1	119.8	..
Q2	115.3	..	..	..	..	117.3	..	..	..	..
Percentage change, latest quarter on corresponding quarter of previous year										
1993 Q1	*1.1*	*−2.8*	*−0.7*	*−0.8*	..	*2.5*	*0.0*	*1.7*	*0.9*	..
Q2	*1.7*	..	..	..	..	*2.6*	..	..	..	..
Percentage change, latest quarter on previous quarter										
1993 Q1	*0.5*	*−1.4*	*−0.4*	*−0.1*	..	*0.2*	*0.6*	*1.0*	*0.1*	..
Q2	*0.5*	..	..	..	..	*0.4*	..	..	..	..

1 Western Germany (Federal Republic of Germany before unification)
2 GNP

2 Consumer prices[1]
Percentage change on year earlier

	United Kingdom	Germany[2]	France	Italy	EC	United States	Japan	Canada	Major 7	OECD
1980	18.0	5.5	13.6	21.0	13.7	13.5	8.0	10.1	12.7	13.7
1985	6.1	2.2	5.8	8.6	6.2	3.5	2.0	4.0	4.0	4.8
1986	3.4	–0.1	2.7	6.1	3.7	1.9	0.4	4.2	2.1	3.0
1987	4.2	0.2	3.1	4.6	3.4	3.6	–0.2	4.3	2.9	3.6
1988	4.9	1.3	2.6	5.0	3.6	4.1	0.5	4.0	3.3	4.3
1989	7.8	2.8	3.7	6.6	5.2	4.8	2.3	5.0	4.6	5.4
1990	9.5	2.7	3.4	6.0	5.6	5.5	3.1	4.8	5.0	5.8
1991	5.9	3.5	3.2	6.5	5.0	4.2	3.3	5.6	4.3	5.2
1992	3.7	4.0	2.4	5.3	4.3	3.0	1.6	1.5	3.1	4.1
1992 Q2	4.1	4.5	2.8	5.5	4.7	3.1	2.3	1.4	3.3	4.2
Q3	3.6	3.4	2.1	5.3	4.1	3.1	1.6	1.3	3.0	3.9
Q4	3.0	3.6	1.9	4.8	3.8	3.0	0.7	1.7	2.8	3.7
1993 Q1	1.8	4.3	2.1	4.3	3.5	3.2	1.2	2.0	2.8	3.7
Q2	1.3	4.2	1.9	4.1	3.3	3.2	0.7	1.7	2.7	3.8
1992 Jul	3.7	3.3	2.2	5.4	4.1	3.2	1.5	1.3	3.0	3.9
Aug	3.6	3.5	2.1	5.2	4.1	3.1	1.6	1.2	3.0	3.9
Sep	3.6	3.6	2.1	5.1	4.0	3.1	2.0	1.3	3.0	3.9
Oct	3.6	3.7	2.0	4.8	3.9	3.2	0.9	1.6	2.9	3.8
Nov	3.0	3.7	1.6	4.7	3.8	3.0	0.4	1.7	2.7	3.7
Dec	2.6	3.7	1.9	4.7	3.6	2.9	0.9	2.1	2.7	3.6
1993 Jan	1.7	4.4	2.1	4.2	3.5	3.3	1.1	2.1	2.9	3.8
Feb	1.8	4.2	2.0	4.4	3.4	3.3	1.3	2.3	2.9	3.8
Mar	1.9	4.2	2.2	4.2	3.4	3.1	1.3	1.9	2.8	3.7
Apr	1.3	4.3	2.0	4.2	3.3	3.2	0.6	1.8	2.7	3.7
May	1.3	4.2	2.0	4.0	3.3	3.2	0.7	1.8	2.7	3.8
Jun	1.2	4.2	1.9	4.1	3.2	3.0	0.9	1.6	2.6	3.8
Jul	1.4	4.3	2.1	4.4	..	2.8	1.7	..	..	..

1 Components and coverage not uniform across countries
2 Western Germany (Federal Republic of Germany before unification)

3 Standardised unemployment rates: percentage of total labour force[1]

	United Kingdom	Germany[2]	France	Italy	EC[3]	United States	Japan	Canada	Major 7	OECD
	GABF	GABD	GABC	GABE	GADR	GADO	GADP	GADN	GAEQ	GADQ
1980	6.4	2.9	6.2	7.5	6.4	7.0	2.0	7.4	5.5	5.8
1985	11.2	7.1	10.2	9.6	10.8	7.1	2.6	10.4	7.2	7.8
1986	11.2	6.4	10.4	10.5	10.8	6.9	2.8	9.5	7.1	7.7
1987	10.3	6.2	10.5	10.9	10.6	6.1	2.8	8.8	6.7	7.3
1988	8.6	6.2	10.0	11.0	9.9	5.4	2.5	7.7	6.1	6.7
1989	7.2	5.6	9.4	10.9	9.0	5.2	2.3	7.5	5.7	6.2
1990	6.8	4.9	8.9	10.3	8.4	5.4	2.1	8.1	5.6	6.1
1991	8.7	4.4	9.4	9.9	8.7	6.6	2.1	10.2	6.3	6.8
1992	9.9	4.8	10.3	10.5	9.5	7.3	2.2	11.2	6.9	7.5
1992 Q2	9.7	4.7	10.2	10.0	9.3	7.4	2.1	11.2	6.8	7.4
Q3	10.1	4.8	10.4	10.1	9.5	7.4	2.2	11.5	7.0	7.5
Q4	10.4	5.1	10.7	9.3	9.7	7.2	2.3	11.5	6.9	7.6
1993 Q1	10.6	5.5	11.0	9.1	10.2	6.9	2.3	10.9	6.8	7.6
Q2	10.4	..	..	..	..	6.9	..	11.3	..	..
1992 Jul	10.0	4.8	10.4	10.1	9.4	7.5	2.2	11.5	6.9	7.5
Aug	10.1	4.8	10.4	–	9.5	7.5	2.2	11.5	6.9	7.5
Sep	10.2	4.9	10.5	–	9.6	7.4	2.2	11.3	6.9	7.5
Oct	10.2	5.0	10.6	9.3	9.6	7.3	2.3	11.3	6.9	7.5
Nov	10.4	5.1	10.7	–	9.7	7.2	2.3	11.7	6.9	7.6
Dec	10.6	5.2	10.9	–	9.9	7.2	2.4	11.4	6.9	7.6
1993 Jan	10.7	5.4	10.9	9.1	10.0	7.0	2.3	11.0	6.8	7.6
Feb	10.6	5.5	11.0	..	10.2	6.9	2.3	10.8	6.8	7.7
Mar	10.5	5.7	11.2	..	10.2	6.9	2.3	11.0	6.8	7.7
Apr	10.5	5.8	11.4	9.1	10.3	6.9	2.3	11.3	6.9	7.7
May	10.4	5.9	11.5	..	10.3	6.8	2.5	11.3	6.9	7.7
Jun	10.4	..	..	..	..	6.9	..	11.3	..	..

1 Uses an ILO based measure of those without work, currently available for work, actively seeking work or waiting to start a job already obtained
2 Western Germany (Federal Republic of Germany before unification)
3 Excludes Denmark, Greece and Luxembourg

4 Balance of payments current account as percentage of GDP

	United Kingdom	Germany[1,2]	France	Italy	United States[1]	Japan[1]	Canada
1980	1.2	–1.7	–0.6	–2.3	0.1	–1.0	–0.6
1985	0.8	2.7	–0.1	–0.9	–2.9	3.6	–0.6
1986	–	4.5	0.3	0.4	–3.5	4.3	–2.3
1987	–1.1	4.1	–0.6	–0.2	–3.6	3.6	–2.1
1988	–3.4	4.2	–0.5	–0.7	–2.6	2.7	–2.6
1989	–4.2	4.9	–0.5	–1.2	–1.9	2.0	–3.6
1990	–3.1	3.2	–0.8	–1.3	–1.6	1.2	–3.9
1991	–1.1	–1.3	–0.5	–1.9	–0.1	2.1	–4.3
1992	–1.9	–1.5	0.3	–2.2	..	..	..
1992 Q2	–2.0	–0.4	0.2	–0.5	–1.2	3.2	–3.9
Q3	–1.5	–0.5	–	–0.5	–1.2	..	..
Q4	–2.6	–0.3	0.2	–0.4	..	..	..
1993 Q1	–2.6	..	..	..	..	..	..

1 Balance as percentage of GNP
2 Western Germany (Federal Republic of Germany before unification)

5 Total industrial production: index numbers

1985 = 100

	United Kingdom	Germany[1]	France	Italy	EC	United States	Japan[2]	Canada[3]	Major 7	OECD[4]
	DVIM	HFGA	HFFZ	HFGB	GACY	HFGD	HFGC	HFFY	GAES	GACX
1980	92.6	97.3	101.9	103.6	97.2	89.1	84.4	86.2	91.0	91.1
1985	100.0	100.3	100.0	100.0	100.1	100.0	100.0	100.0	100.0	100.0
1986	102.4	102.3	100.9	103.6	102.3	100.9	99.8	99.3	101.1	101.2
1987	105.7	102.6	102.8	107.6	104.7	106.0	103.3	104.1	104.9	104.9
1988	109.5	106.3	107.7	114.1	109.0	110.7	113.7	109.6	110.7	110.7
1989	109.9	111.4	112.1	117.6	113.1	112.4	120.3	109.2	113.8	114.6
1990	109.3	117.2	114.2	117.6	115.2	112.4	125.4	104.6	115.3	116.7
1991	106.1	120.7	114.1	115.4	115.1	110.3	127.8	100.3	114.7	116.1
1992	105.8	118.4	113.0	114.8	..	112.9	120.4	101.2	114.1	..
1992 Q2	105.0	120.1	113.8	115.5	114.7	112.6	120.7	100.6	114.3	114.5
Q3	105.9	118.5	113.6	112.8	113.8	112.9	120.3	101.3	114.0	114.3
Q4	106.8	112.9	110.6	112.0	111.5	114.7	117.2	102.9	113.4	113.5
1993 Q1	107.0	109.5	..	113.3	110.4	116.3	117.8	104.9	114.0	113.9
Q2	107.9	..	..	..	..	116.8	..	..	..	..
1992 Jun	104.6	119.3	113.7	115.7	114.4	112.3	121.3	100.6	114.1	114.3
Jul	105.8	118.7	113.8	116.3	114.8	113.1	121.1	99.9	114.5	114.8
Aug	105.7	118.3	113.8	110.7	113.1	112.9	117.6	101.9	113.3	113.6
Sep	106.1	118.4	114.1	111.4	113.5	112.5	122.1	102.1	114.1	114.3
Oct	107.4	115.5	114.7	113.7	113.7	113.9	118.3	102.4	114.0	114.2
Nov	106.7	113.2	109.7	114.6	111.8	114.8	116.8	103.0	113.6	113.6
Dec	106.5	110.1	108.1	107.6	109.0	115.4	116.3	103.4	112.7	112.7
1993 Jan	106.4	109.8	108.3	113.4	109.4	115.8	115.9	103.7	113.2	113.0
Feb	107.9	108.4	111.0	114.1	110.9	116.4	117.2	104.7	114.0	114.1
Mar	106.8	110.4	109.9	112.4	110.7	116.6	120.3	106.3	114.7	114.6
Apr	106.8	109.0	109.3	107.6	108.8	116.9	117.1	105.3	113.6	113.4
May	108.7	109.9	109.5	112.0	..	116.8	114.6	105.1	113.7	..
Jun	108.1	..	..	..	..	116.6	..	..	..	..
Percentage change: average of latest three months on that of corresponding period of previous year										
1993 May	*2.1*	*–9.1*	*–3.8*	*–5.2*	..	*3.8*	*–3.0*	*5.0*	*–0.3*	..
Jun	*2.8*	..	..	..	..	*3.7*	..	..	..	..
Percentage change: average of latest three months on previous three months										
1993 May	*0.5*	*0.3*	*0.4*	*–0.9*	..	*0.8*	*0.7*	*1.6*	*0.6*	..
Jun	*0.8*	..	..	..	..	*0.4*	..	..	..	..

1 Western Germany (Federal Republic of Germany before unification)
2 Not adjusted for unequal number of working days in a month
3 GDP in industry at factor cost and 1986 prices
4 Some countries excluded from area total

6 Producer prices (manufacturing)
Percentage change on a year earlier

	United Kingdom	Germany[1]	France[2]	Italy	EC	United States	Japan	Canada	Major 7	OECD
1980	*14.1*	*7.1*	*9.2*	..	..	*13.5*	*14.8*	*13.3*	..	..
1985	*5.3*	*1.9*	*4.4*	*7.8*	*5.0*	*0.9*	*−0.8*	*2.8*	*1.9*	*3.0*
1986	*4.3*	*−2.4*	*−2.8*	*0.2*	*−0.8*	*−1.4*	*−4.7*	*0.9*	*−1.5*	*−1.1*
1987	*3.7*	*−0.4*	*0.6*	*3.0*	*1.3*	*2.1*	*−2.9*	*2.8*	*1.1*	*1.5*
1988	*4.3*	*1.6*	*5.1*	*3.5*	*3.5*	*2.5*	*−0.2*	*4.4*	*2.5*	*3.5*
1989	*4.7*	*3.4*	*5.4*	*5.9*	*5.1*	*5.1*	*2.1*	*1.9*	*4.4*	*5.4*
1990	*5.8*	*1.5*	*−1.1*	*4.2*	*2.3*	*5.0*	*1.6*	*0.3*	*3.4*	*3.9*
1991	*5.4*	*2.0*	*−1.3*	*3.3*	*2.3*	*2.1*	*1.0*	*−1.1*	*2.0*	*2.6*
1992	*3.5*	*1.6*	*−1.6*	*1.9*	*1.4*	*1.2*	*−0.8*	*0.5*	*0.7*	*1.8*
1992 Q2	*3.4*	*2.4*	*−1.1*	*2.1*	*1.8*	*1.3*	*−0.9*	*−0.2*	*0.9*	*1.9*
Q3	*3.3*	*1.4*	*−0.9*	*1.9*	*1.4*	*1.5*	*−0.8*	*1.6*	*1.1*	*2.1*
Q4	*3.2*	*1.0*	*−1.5*	*2.3*	*1.2*	*1.5*	*−1.1*	*3.2*	*1.0*	*2.2*
1993 Q1	*3.2*	*0.7*	*−2.3*	*3.1*	*1.2*	*2.0*	*−1.1*	*4.0*	*1.2*	*2.5*
Q2	*3.7*	*0.0*	..	..	..	*1.9*	*−1.5*	*3.2*	..	..
1992 Jul	*2.8*	*1.6*		*1.9*	*1.6*	*1.7*	*−0.8*	*0.8*	*1.1*	*2.1*
Aug	*2.7*	*1.5*		*1.9*	*1.4*	*1.5*	*−0.9*	*1.6*	*1.0*	*2.0*
Sep	*2.7*	*1.2*		*1.9*	*1.3*	*1.6*	*−0.9*	*2.2*	*1.0*	*2.1*
Oct	*2.8*	*1.0*		*2.0*	*1.1*	*1.7*	*−1.1*	*3.0*	*1.1*	*2.2*
Nov	*3.1*	*1.0*		*2.2*	*1.2*	*1.4*	*−1.1*	*3.2*	*0.9*	*2.1*
Dec	*3.4*	*1.0*		*2.5*	*1.3*	*1.5*	*−1.2*	*3.6*	*1.0*	*2.2*
1993 Jan	*3.6*	*1.0*		*2.8*	*1.2*	*2.0*	*−1.1*	*4.4*	*1.2*	*2.6*
Feb	*3.6*	*0.7*		*2.9*	*1.2*	*2.0*	*−1.0*	*3.8*	*1.2*	*2.5*
Mar	*3.7*	*0.6*		*3.5*	*1.2*	*2.0*	*−1.2*	*3.8*	*1.2*	*2.6*
Apr	*4.0*	*0.3*		*3.7*	*1.1*	*2.3*	*−1.3*	*3.8*	*1.4*	*2.8*
May	*4.0*	*−0.1*		..	*1.1*	*2.0*	*−1.5*	*3.2*	*1.1*	*2.7*
Jun	*4.0*	*−0.3*		..	..	*1.4*	*−1.5*	*3.0*	..	..
Jul	*4.1*	..		..	..	..	..	..	..	..

1 Western Germany (Federal Republic of Germany before unification).
2 Producer prices in intermediate goods

7 Total employment: index numbers[1]

1985 = 100

	United Kingdom	Germany[2,3]	France[3]	Italy	EC	United States[3]	Japan	Canada[3]	Major 7	OECD
	DMBC	GAAR	GAAU	GAAS	GADW	GADT	GADU	GADS	GAEU	GADV
1980	103.5	102	101.1	100	..	93	95	95	..	..
1985	100.0	100	100.0	100	100	100	100	100	100	100
1986	100.1	101	100.5	101	101	102	101	103	101	101
1987	101.9	102	100.9	100	102	105	102	106	103	103
1988	105.2	103	102.0	102	104	107	104	109	105	105
1989	107.8	104	103.5	101	106	109	106	111	107	107
1990	108.5	107	104.6	103	107	110	108	112	108	109
1991	105.5	109	104.6	104	108	109	110	110	108	108
1992	102.6	109	104.2	103	106	110	111	109	108	108
1992 Q1	103.9	109	104.1	103	106	108	109	106	107	107
Q2	103.4	110	104.6	105	107	110	112	109	109	109
Q3	102.1	110	104.7	104	106	111	112	112	109	109
Q4	101.2	109	103.5	102	105	110	111	109	108	108
1993 Q1	100.8	108	103.2	100	104	109	109	107	107	107
Q2	..	..	..	101	..	111	..	111	..	..
1993 Mar	..	108	103.2	–	104	110	109	107	107	107
Apr	..	108	..	101	..	110	111	108	108	108
May	..	108	..	..	..	111	112	111	109	108
Jun	..	..	..	..	..	113	..	114	..	..
Percentage change, latest quarter on that of corresponding period of previous year										
1993 Q1	*−3.0*	*−0.9*	*−0.9*	*−2.9*	*−1.9*	*0.9*	*0.0*	*0.9*	*0.0*	*0.0*
Q2	..	..	..	*−3.8*	..	*0.9*	..	*1.8*	..	..
Percentage change latest quarter on previous quarter										
1993 Q1	*−0.4*	*−0.9*	*−0.3*	*−2.0*	*−1.0*	*−0.9*	*−1.8*	*−1.8*	*−0.9*	*−0.9*
Q2	..	..	..	*1.0*	..	*1.8*	..	*3.7*	..	..

1 Not seasonally adjusted except for the United Kingdom
2 Western Germany (Federal Republic of Germany before unification)
3 Excludes members of armed forces

8 Average wage earnings in manufacturing[1] Percentage change on a year earlier

	United Kingdom[2]	Germany[3]	France	Italy	EC	United States	Japan	Canada	Major 7	OECD
1980	*17.8*	*6.5*	*15.2*	*18.7*	*10.3*	*8.6*	*7.5*	*10.9*	*9.0*	*9.1*
1985	*9.1*	*4.2*	*5.7*	*11.2*	*7.5*	*4.2*	*3.1*	*4.2*	*5.3*	*5.3*
1986	*7.7*	*4.0*	*3.9*	*4.8*	*5.0*	*2.0*	*1.4*	*3.0*	*3.0*	*4.0*
1987	*8.0*	*3.8*	*3.2*	*6.5*	*5.7*	*2.0*	*1.7*	*2.9*	*2.9*	*2.9*
1988	*8.5*	*4.6*	*3.1*	*6.1*	*5.4*	*2.9*	*4.6*	*3.8*	*4.7*	*4.7*
1989	*8.7*	*3.5*	*3.8*	*6.1*	*6.0*	*2.8*	*5.8*	*5.5*	*4.5*	*5.4*
1990	*9.4*	*5.1*	*4.5*	*7.2*	*7.3*	*3.6*	*5.4*	*5.2*	*5.2*	*5.9*
1991	*8.2*	*5.7*	*4.3*	*9.8*	*7.5*	*2.6*	*3.5*	*4.9*	*4.9*	*4.8*
1992	*6.6*	..	*3.6*	*5.4*	*6.3*	*2.6*	*1.0*	*3.9*	*3.9*	*3.8*
1992 Q2	*6.0*	..	*3.8*	*6.0*	*6.4*	*2.6*	*2.0*	*3.9*	*4.0*	*4.7*
Q3	*6.1*	..	*3.5*	*3.8*	*4.8*	*1.7*	*0.7*	*3.1*	*3.1*	*3.8*
Q4	*5.7*	..	*3.6*	*2.9*	*4.7*	*1.7*	*−0.1*	*3.1*	*2.2*	*3.6*
1993 Q1	*4.7*	..	*3.4*	*2.8*	*4.7*	*2.5*	*−0.5*	*3.0*	*2.4*	*3.1*
Q2	*4.9*	.	*2.6*	*3.1*	..	*2.5*	..	..	..	..
1992 Jun	*5.9*	..	..	*4.7*	*7.1*	*2.6*	*3.4*	*3.1*	*4.4*	*4.3*
Jul	*6.2*	..	*3.5*	*4.0*	*5.5*	*1.7*	*2.0*	*3.1*	*2.8*	*3.4*
Aug	*6.5*	..	..	*3.5*	*5.6*	*2.6*	*−1.8*	*3.9*	*2.4*	*3.1*
Sep	*5.7*	..	..	*3.7*	*4.8*	*2.5*	*1.1*	*3.1*	*3.3*	*4.0*
Oct	*6.2*	..	*3.6*	*4.1*	*5.4*	*2.5*	*1.2*	*3.9*	*3.3*	*3.9*
Nov	*5.6*	..	..	*2.1*	*4.7*	*1.7*	*1.2*	*3.1*	*3.2*	*3.1*
Dec	*5.4*	..	..	*2.4*	*5.4*	*2.5*	*−1.0*	*3.8*	*1.8*	*2.4*
1993 Jan	*5.0*	..	*3.4*	*2.8*	*4.8*	*3.4*	*−3.6*	*3.8*	*2.4*	*2.3*
Feb	*5.1*	..	..	*2.8*	*4.7*	*2.5*	*1.3*	*3.8*	*3.3*	*3.9*
Mar	*4.3*	..	..	*2.7*	*4.7*	*2.5*	*1.0*	*2.3*	*3.2*	*3.9*
Apr	*5.4*	..	*2.6*	*2.6*	..	*2.5*	*2.0*	*2.3*	*2.4*	*3.1*
May	*4.6*	..	..	*2.6*	..	*2.5*	*2.3*	*2.3*	*3.2*	*3.1*
Jun	*4.7*	..	..	*4.2*	..	*2.5*	..	..	..	..

1 Definitions of coverage and treatment vary among countries
2 Figures for Great Britain refer to weekly earnings; others are hourly
3 Western Germany (Federal Republic of Germany before unification)

9 Retail Sales (volume): index numbers

1985 = 100

	United[2] Kingdom	Germany[1]	France	Italy	EC	United States	Japan	Canada	Major 7	OECD
	FAAM	GADD	GADC	GADE	GADH	GADA	GADB	GACZ	GAEW	GADG
1980	86.2	103	101.0	83.1	94.6	84.0	103.2	83.6	89.9	90.7
1985	100.0	100	100.0	100.0	99.9	100.0	99.9	100.0	100.0	100.0
1986	105.2	103	102.4	106.8	104.3	105.5	101.5	104.6	104.5	104.4
1987	110.7	107	104.5	112.0	108.6	108.4	107.1	110.3	108.3	108.0
1988	117.7	111	108.0	109.5	111.7	112.1	112.2	114.6	111.9	111.6
1989	119.9	114	109.5	117.1	116.1	114.6	116.0	114.5	114.9	114.8
1990	120.4	123	110.1	114.4	119.1	115.0	121.8	112.0	116.6	116.7
1991	119.5	130	109.7	111.2	120.1	112.7	123.3	100.4	115.4	115.7
1992	120.3	128	108.9	116.5	120.4	117.7	119.6	101.6	117.5	117.5
1993 Q1	123.1	123	108.7	..	117.9	120.2	116.0	103.9	117.8	117.2
Q2	123.7	..	110.0	..	..	..	..	..	..	..
1992 Jul	119.8	126	109.2	117.0	120.4	116.9	121.5	101.4	117.3	117.5
Aug	120.9	125	108.8	112.8	119.3	117.4	119.4	102.3	116.9	116.9
Sep	121.2	129	109.8	115.8	121.3	118.0	119.0	102.5	117.8	117.9
Oct	121.5	127	110.7	119.0	121.0	120.3	116.5	103.3	118.8	118.5
Nov	121.5	129	105.2	122.1	120.4	120.0	115.4	102.9	118.4	117.8
Dec	120.1	133	109.6	116.4	121.0	121.4	115.2	103.1	119.3	118.8
1993 Jan	122.7	122	110.5	124.8	120.5	121.1	117.3	104.8	119.4	118.7
Feb	123.0	123	106.5	110.9	117.7	120.5	117.1	103.3	117.9	117.4
Mar	123.5	125	109.1	..	115.5	119.1	113.5	103.5	116.0	115.6
Apr	123.0	125	112.1	..	118.2	120.7	..	104.8	117.6	117.2
May	123.1	119	104.3	..	..	120.9	..	104.6	..	..
Jun	124.9	..	113.7	..	..	..	..	..	..	..
Jul	125.3	..	..	..	..	..	..	..	..	..
Percentage change average of latest three months on that of corresponding period of previous year										
1993 Jun	*3.1*	..	*1.0*	..	..	..	..	..	..	..
Jul	*3.7*	..	..	..	..	..	..	..	..	..
Percentage change average of latest three months on previous three months										
1993 Jun	*0.5*	..	*1.2*	..	..	..	..	..	..	..
Jul	*1.0*	..	..	..	..	..	..	..	..	..

1 Western Germany (Federal Republic of Germany before unification)
2 March to July estimates due to rebasing to 1990

Chart I: Gross domestic product

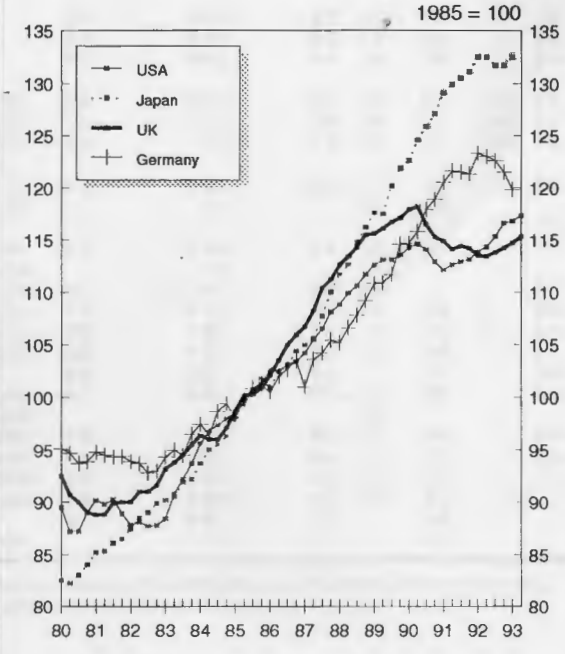


Chart II: Consumer price index

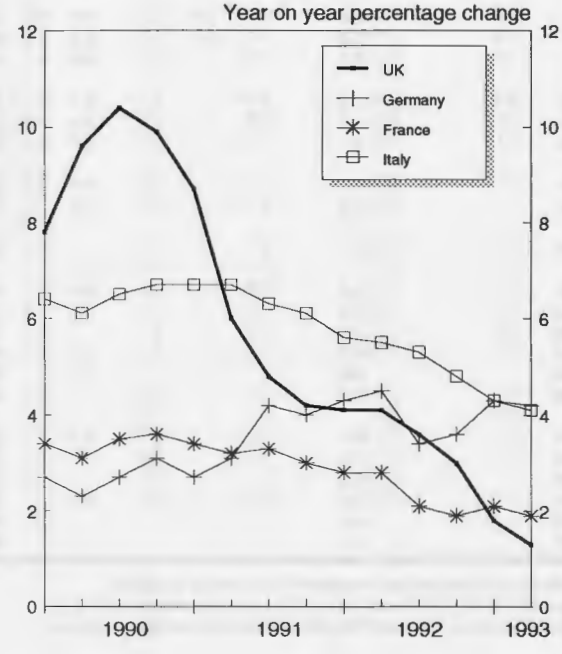
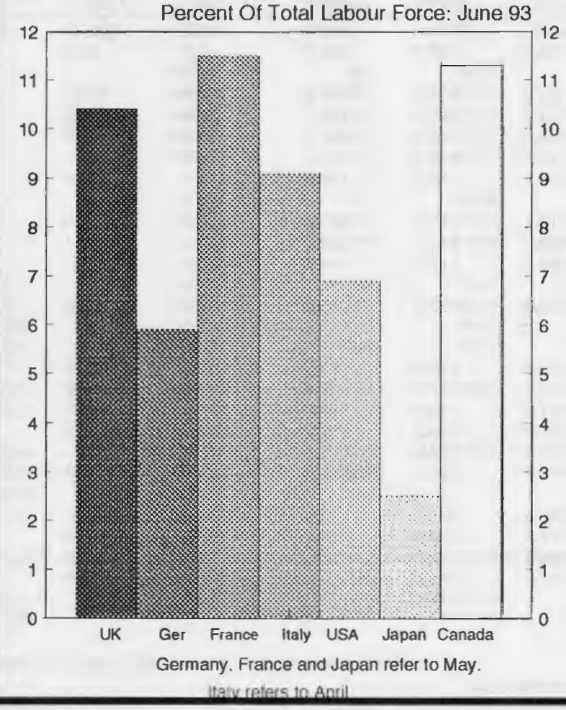


Chart III: Standardised unemployment



Germany, France and Japan refer to May.
Italy refers to April

Chart IV: Current account balance - percentage of GDP at market prices

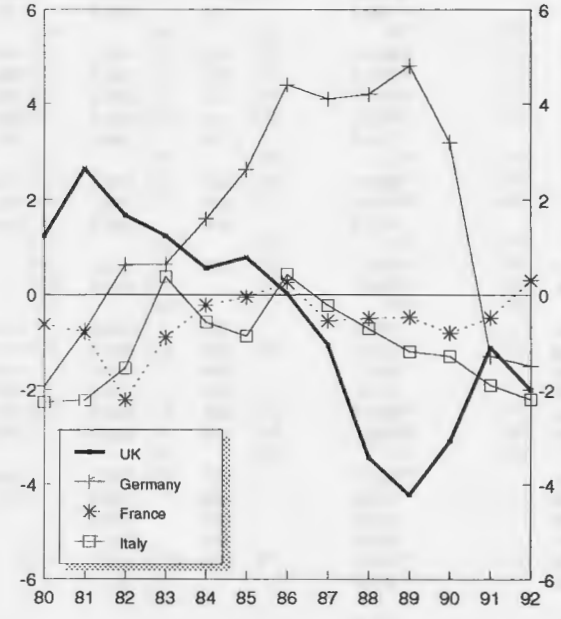


Chart V: Industrial production

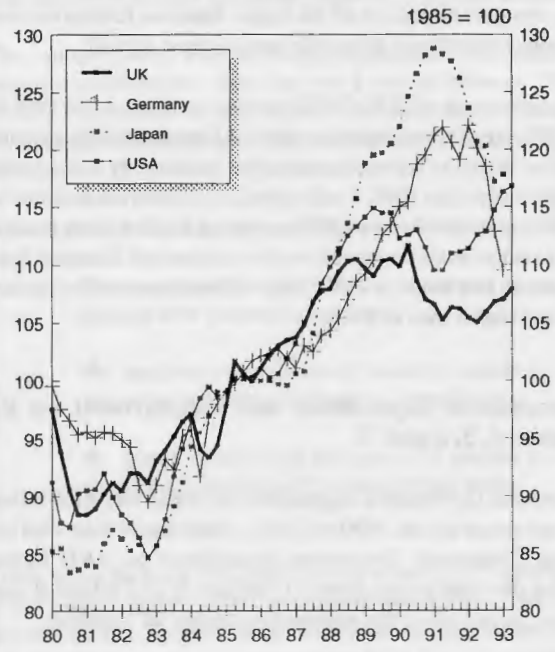


Chart VI: Producer price inflation

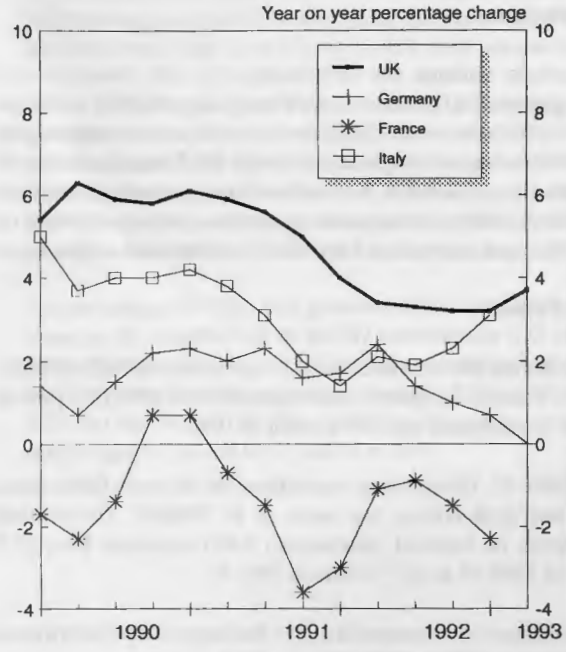


Chart VII: Employment

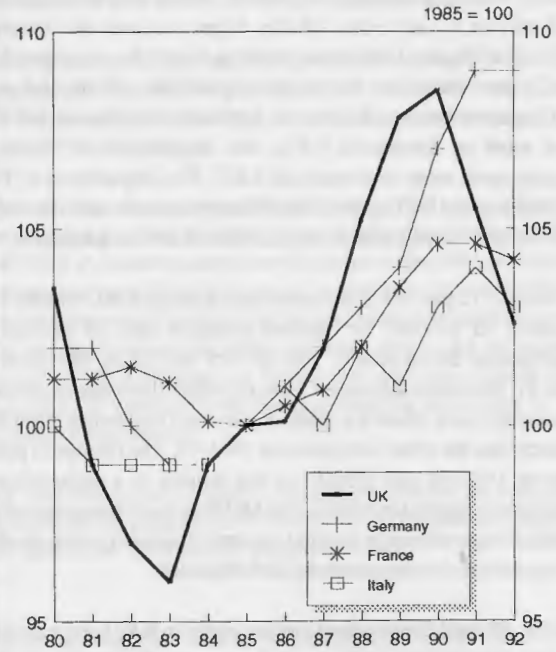
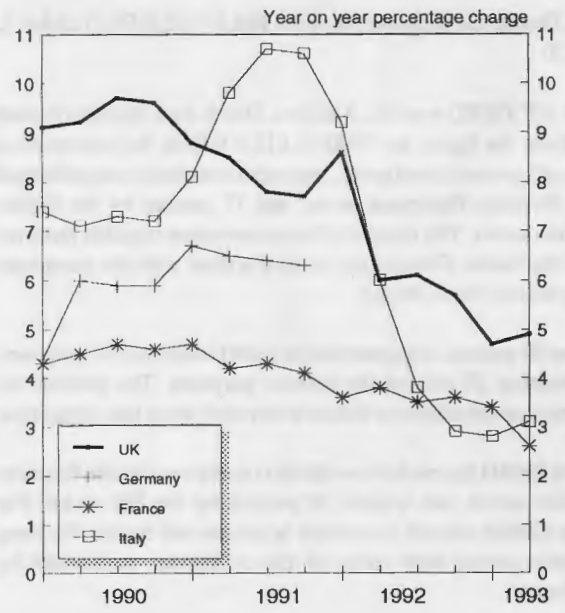


Chart VIII: Wage earnings (manufacturing)



RESEARCH AND DEVELOPMENT IN THE UNITED KINGDOM IN 1991

by Willie Lister and Jeff Golland CSO

Introduction

This article updates the information on UK Research and Development (R&D) in *Economic Trends* August 1992. It uses the results of the latest in the CSO's two series of annual inquiries into R&D, the survey of Government-funded R&D and the survey of Buisness enterprise R&D. It describes Gross domestic expenditure on R&D (GERD), Government expenditure and empolyment on R&D, Business enterpriose R&D ansd Imternational comparisons.

Main Points

- In 1991 the UK's Gross domestic expenditure on R&D (GERD) was £11.9 billion compared with £12.0 billion in 1990 - 2.1 percent of GDP as compared with 2.2 percent in 1990.

- In 1991-92 Government expenditure on in-house (intramural) R&D was £1.6 billion, the same as in 1990-91. Government expenditure on external (extramural) R&D increased from £3.5 billion in 1990-91 to £3.7 billion in 1991-92.

- Expenditure on intramural R&D by business enterprises fell from £8.1 billion in 1990 to £7.8 billion in 1991

- In relation to G7 countries, the UK is average in terms of overall gross domestic expenditure as a ratio of GDP. With France and the USA it is in the group of countries spending the highest proportion on government funded defence-related R&D.

Gross Domestic Expenditure on R&D (GERD) (Tables 1, 2 and 3)

In 1991 UK GERD was £11.9 billion. This is little changed in cash terms from the figure for 1990 of £12.0 billion, but represents a decline of 7 percent in real terms. Just under two-thirds was performed by the Business Enterprise sector and 17 percent by the Higher Education sector. The Business Enterprise sector supplied just over half of the funds, Government around a third with the remainder coming mainly from abroad.

Just over 80 percent of expenditure in GERD was for civil purposes, the remaining 20 percent for defence purposes. The patterns for performers and funders are different between these two categories.

For civil GERD just under two-thirds is performed by the Business Enterprise sector and around 20 percent by the HE sector. For defence GERD around two-thirds is performed by the Business Enterprise sector with most of the remainder performed by Government.

The Business Enterprise sector supplies 58 percent of the funds for civil GERD, Government 28 percent with most of the remaining 15 percent coming from abroad. For defence GERD, Government supplies over 60 percent of the funds, Business Enterprise over 20 percent with most of remainder coming from abroad.

As a percentage of GDP, GERD has declined from 2.3 in 1986 to 2.1 in 1991. In real terms, expenditure on R&D performed by Government and the Business Enterprise sector has declined by 4 and 6 percent respectively since 1986. Funding by Government has declined by 17 percent in real terms since 1986, whereas funding from abroad has increased by around a quarter over the same period. Business funding peaked in real terms in 1989; it has fallen since then but remains 2 percent higher than in 1986.

Government Expenditure and Employment on R&D (Tables 4, 5, 6 and 7)

Intramural Government expenditure on R&D was £1.6 billion at current prices in both 1990 and 1991, a decrease of 8 per cent in real terms. Extramural Government expenditure on R&D increased during the same period, from £3.5 billion to £3.7 billion at current prices; in real terms this represents a decline of 1 percent.

In the 1991-92 financial year the Ministry of Defence was responsible for just under 50 per cent of intramural Government expenditure and 42 per cent of extramural expenditure. The Research Councils were responsible for 31 per cent of intramural expenditure and 13 per cent of extramural expenditure. The SERC was the major source of funding among the Research Councils, with a total expenditure of £458 million in cash terms. Of this 70 per cent was on extramural R&D. The Higher Education Funding Councils contributed just over 25 per cent of the extramural expenditure. Of the individual civil departments the Ministry of Agriculture Fisheries and Food spent most on intramural R&D; the Department of Trade and Industry spent most on extramural R&D. The Department of Trade and Industry and the Department of Energy between them accounted for over half the extramural expenditure of civil departments.

In 1991-92, 12 percent of current expenditure on R&D was for basic research, 53 percent for applied research and 35 percent for experimental development. This is very similar to the pattern in 1990-91. Within the Research Councils, which dominate expenditure on basic research, there is evidence of a small movement from basic research into the other categories in 1991-92. The change in pattern between 1989-90 and 1990-91 is due mainly to a reclassification from basic to applied in NERC. The MOD by itself comprises almost a third of expenditure on applied research and nearly nine-tenths of all expenditure on experimental development.

In 1991-92 total Government employment on R&D decreased by 4 per cent over the previous year. 42 per cent of Government R&D employees were classified as researchers. During the period 1986-87 to 1991-92 there was a reduction in Government employment in R&D of 7 percent.

Business Enterprise Expenditure on R&D (Tables 8, 9, and 10)

Total expenditure on intramural business enterprise R&D decreased from £8.1 billion in 1990 to £7.8 billion in 1991 at current prices, a decline of 10 percent in real terms. Civil R&D, which represents over 80 per cent of expenditure, was about the same in cash terms as in 1990 but decreased by 7 percent in real terms. Defence R&D declined by 17 percent in current prices or 22 percent in real terms.

The product group with the largest expenditure was electronics, where expenditure decreased by over 8 percent between 1990 and 1991 - (14 percent in real terms). The next largest group was chemicals (including pharmaceuticals) where expenditure decreased by 4 percent (10 percent in real terms).

Among other product groups expenditure on R&D was as follows:-

- aerospace: broadly similar in current prices but a decline of 6 percent in real terms
- mechanical engineering: broadly similar in current prices but a decline of 6 percent in real terms
- motor vehicles: an increase of 5 percent in current prices but a decline of 2 percent in real terms.

There was a decrease over 1990 in the percentage of funds reported to have come directly from Government from 17 to 15 percent (but see note in box). The percentage of funds from other sources (mainly own funds) showed little change from 1990. Over the period 1986 to 1991 there has been a steady decline in the percentage of funds from Government and an increase in the percentage coming from overseas.

Defence R&D in the Business Enterprises

Aerospace and Electronics represented around 79 per cent of expenditure on defence R&D in the industrial sector in 1991. Defence expenditure in both product groups declined by 16 and 24 percent respectively.

Part of the change between 1990 and 1991 may relate to the instruction given to companies to record the **direct** source of funding of R&D. A clearer instruction was given in the 1991 survey to those companies specifically engaged in defence related R&D. Funds originating from Government for subcontracted work or work done on international collaborative ventures would not be recorded as coming from Government. Own funds and other private industry supplied 28 percent of the funding with the remaining 16 percent coming from abroad.

In 1991 enterprises involved in R&D for defence purposes drew 48 percent of the funding for it directly from Government compared to 55 percent in 1990 and 58 percent in 1989.

Employment on Business Enterprise R&D (Table 11)

Numbers of full-time equivalent staff employed on R&D declined by just over 9 percent between 1990 and 1991 - continuing a decline since 1986. The percentage decline was greatest among technicians, laboratory assistants and draughtsmen - from 41 to 36 thousand - or just over 12 percent. Over the period 1989 to 1991 the proportion of employees classified as working on R&D for civil purposes, as opposed to defence purposes, increased from 78 percent of the total to 82 percent.

International Comparisons (Tables 12 and 13)

Table 12 shows the trend of GERD as a percentage of GDP for the G7 countries in the period 1986 to 1991. It shows how they divide into three groups, with Germany, Japan and the United States at the top; Canada and Italy at the bottom; the UK and France in the middle.

Table 13 shows the government R&D as a percentage of total government expenditure. Provisional figures for 1991 for France indicate that it has the highest percentage allocated to R&D - though earlier figures suggest that the USA will exhibit a similar pattern. The UK occupied a middle-ranking position with proportionately more devoted to defence R&D than all countries other than the USA.

As a percentage of GDP, UK government funding for overall R&D occupies the middle rank of the G7 countries, at 0.88 percent. In terms of funding of defence R&D, the USA has the highest percentage at 0.71 (greater than its percentage for civil), followed by France at 0.53 and the UK at 0.40. The remaining G7 countries record low percentages of around 0.10 percent or less.

ANNEX

Definitions

The R & D statistics in this article are based on definitions given in the Frascati Manual[4], published by the OECD for use by member states and applied by other international agencies as a basis for such figures. According to this manual, the definition of R & D is:"....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". This definition covers work on both science and technology and the social sciences and humanities.

R&D is defined for the purposes of this article in the following categories:

Basic or fundamental research: experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.

Applied research: research undertaken with either a general or a particular application in view.

Experimental development: the use of the results of basic and applied research directed to the introduction of new materials, processes, products, devices and systems, or the improvement of existing ones. It should include the prototype or pilot plant stage, design and drawing required during R&D and innovative work done on contracts with outside organisations, government departments, and public bodies. Firms in the aerospace industry are asked to include expenditure on development batches.

Defence R&D

Defence includes all R&D programmes undertaken primarily for defence reasons regardless of their content or whether they have secondary civil applications. It includes nuclear and space R&D undertaken for defence purposes. It does not include civil R&D financed by ministries of defence, for instance on meteorology or telecommunications. It includes defence R&D commissioned by overseas clients.

Sectors of the Economy

Sectors of the economy are defined in a Central Statistical Office publication[5], except that higher education is identified separately as recommended in the Frascati Manual. Central Government includes the research councils and, up to 1985, UKAEA which became a public corporation in 1986.

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. Every four years there is a benchmark survey of industrial R&D covering companies classified to production or construction on the CSO's VAT-based register; public corporations listed in the National Accounts; all known industrial research associations and private research laboratories; service companies known to fund 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. Using information from the latest benchmark survey, the sample is designed to include the enterprise groups spending most on R&D. It is extended so that as far as possible all Product Groups are covered. The 1991 survey obtained returns from 120 company groups representing about 85 per cent of total expenditure on business enterprise R&D.

Gross domestic expenditure on R&D

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 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 survey of industrial R&D.

c. **Higher Education R&D** is estimated by the Universities 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. In 1990 these represented about 80 per cent of total GERD (a similar proportion to previous years). The methods of estimating R&D performed by Higher Education Institutes, which represents about 15 per cent of total GERD, have been reviewed since last year with resulting revisions to the figures for the years 1987 to 1989.

Net and Gross Expenditure

In the Government survey the following details are collected:-

(a) gross intramural expenditure on salaries and wages, materials and equipment and other current and capital expenditure;

(b) gross expenditure on R&D performed elsewhere within the central government sector, i.e. performed by Research Councils, under other Votes or with central government funds;

(c) gross expenditure on extramural R&D performed outside the central government sector and current and capital grants for research purposes (including subscriptions to research bodies), analysed by receiving sector;

(d) receipts used directly to finance expenditure (appropriations-in-aid), analysed by paying sector (including other central government bodies);

Total gross expenditure= (a)+(c) only, (b) being excluded to avoid double-counting of payments from one part of central government to another.

Net Expenditure= (a)+(b)+(c)-(d); the aggregate of net expenditure on all returns equals the R&D element of the government's budget expenditure. This is used for international comparisons of Government expenditure.

This year the tables mainly show figures for gross Government expenditure. Detailed tables of net Government expenditure are published in the Annual Review of Government Funded R&D[1]. About 70 per cent of gross Government expenditure is extramural. Extramural R&D, however, is more difficult to measure than intramural; some of the extramural data in the tables are being reviewed.

Employment

The categories "researchers", "technicians" and "administrative" follow the Frascati classification by occupation. In previous years CSO's R&D statistics used a system partly based on educational qualification; so there is a discontinuity with the figures for earlier years.

International comparisons

International comparisons need to be made with caution as methods of collecting R&D data vary from country to country and different countries have different classification systems. The figures for Japan shown in the table are OECD estimates.

Rounding

Throughout the tables, components of totals have been rounded independently of the totals. Therefore the rounded totals will not always be equal to the sums of the rounded components. In the tables, " - " means less than half final digit shown.

Revisions

Some figures have been revised in the light of later information. In particular, estimates of MOD's intramural expenditure were revised down after study showed that some activity which had been counted as R&D did not comply fully with Frascati definitions.

References

(1) Cabinet Office *Annual Review of Government Funded Research & Development 1993*, HMSO £28

(2) CSO Business Monitor MO14 1989, *Industrial Research and Development Expenditure and Employment*, HMSO £9.50

(3) CSO Bulletin 7/93, *Industrial Research and Development Expenditure and Employment* (1991), Central Statistical Office £3

(4) *The Measurement of Scientific and Technical Activities* (The Frascati Manual), OECD Paris 1981, available from HMSO

5) The CSO Blue Book *United Kingdom National Accounts* 1993 edition.

(6) CSO Press Release CSO(93)50 31 March 1993, Gross Domestic Expenditure on Research and Development, Provisional Figures for 1991.

(7) Main Science and Technological Indicators 1992/2, OECD, Paris 1993.

(8) International Comparisons of Research and Development Spending, December 1992, HMSO price £9

Table 1 Gross Expenditure on Research and Development (GERD) by sectors 1991 (2)

£m current prices

Sectors providing the funds(1)	Sectors carrying out the work(1) Government (5)	Higher education	Business enterprise(3)	Private non-profit(4)	Totals	Abroad
Government	1334	1455	1135	151	4075	364
Higher education	-	90	-	-	90	-
Business enterprise	197	157	5393	234	5981	-
Abroad	30	107	1240	21	1397	-
Private non-profit	63	211	-	88	362	-
TOTAL	1624	2020	7768	494	11906	364
Civil :						
Government	658	1433	425	143	2659	196
Higher education	-	90	-	-	90	-
Business enterprise	126	142	4986	234	5488	-
Abroad	16	107	891	21	1034	-
Private non-profit	35	211	-	88	335	-
TOTAL	834	1983	6301	487	9605	196
Defence (5) :						
Government	677	22	710	8	1417	168
Higher education	-	-	-	-	-	-
Business enterprise	71	15	407	-	493	-
Abroad	14	-	349	-	363	-
Private non-profit	28	-	-	-	28	-
TOTAL	790	37	1466	8	2301	168

Notes:
(1) The OECD terminology is now used for describing the breakdown of GERD by sector. "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", corresponds to the "Corporate" sector and includes public corporations and research associations as well as commercial and industrial companies. "Abroad" was previously called "Overseas". "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 seperate OECD sector.
(2) Some of the numbers have been estimated.
(3) Business enterprise includes the United Kingdom Atomic Energy Authority, which became a public corporation in April 1986.
(4) Part of the expenditure classified to this sector in previous years has been reclassified to the Higher Education Sector
(5) A study of MoD's intramural R&D expenditure has shown that some work included in that category does not accord with the internationally accepted Frascati definitions of R&D. Accordingly, these figures have been revised downwards.

Table 2 Gross Expenditure on R&D (GERD) in the UK by performer

	1986r	1987r	1988r	1989r	1990r	1991	%change 1986-1991
Expenditure at current prices (£m):							
Performed by:							
Government	1212	1264	1360	1534	1566	1624	34.0
Business enterprise	5951	6335	6922	7650	8099	7768	30.5
Higher education	1288	1460	1575	1689	1873	2020	56.9
Private non-profit	317	324	370	415	480	494	56.1
TOTAL	8768	9383	10227	11288	12019	11906	35.8
Expenditure in real terms (£m 1991 price level) (1) :							
Performed by:							
Government	1685	1665	1670	1767	1671	1624	-3.6
Business enterprise	8269	8345	8498	8813	8639	7768	-6.1
Higher education	1790	1923	1934	1945	1998	2020	12.9
Private non-profit	440	427	455	479	512	494	12.3
TOTAL	12183	12359	12556	13004	12820	11906	-2.3
Total as % GDP(2)	2.29	2.22	2.18	2.20	2.19	2.08	

Notes:
(1) Using the adjusted GDP deflator.
(2) GDP = gross domestic product at market prices (average based) as in the UN definition.

r = revision to figures in R&D article in August 92 edition of Economic Trends and to figures in Annual Review of Government Funded R&D 1992

Table 3 Gross expenditure on R&D (GERD) by funder

	1986r	1987r	1988r	1989r	1990r	1991	% change 1986-1991
Expenditure at current prices (£m)							
Funded by:							
Government	3541	3640	3664	4031	4225	4075	15.1
Higher education	54	65	77	81	84	90	67.5
Business enterprise	4199	4643	5331	5788	6007	5981	42.4
Abroad	800	840	937	1134	1394	1397	74.7
Private non-profit	174	195	217	253	309	362	108.0
TOTAL	8768	9383	10227	11288	12019	11906	35.8
Expenditure in real terms (£m 1991 price level) (1)							
Funded by:							
Government	4921	4794	4499	4644	4506	4075	-17.2
Higher education	74	86	95	93	90	90	20.6
Business enterprise	5835	6116	6546	6668	6407	5981	2.5
Abroad	1111	1106	1150	1307	1487	1397	25.7
Private non-profit	242	257	267	292	330	362	49.7
TOTAL	12183	12359	12556	13004	12820	11906	-2.3
Total as % GDP	2.29	2.22	2.18	2.20	2.19	2.08	

Notes:
(1) Using the adjusted GDP deflator
(2) GDP = gross domestic product at market prices (average based) as in the UN definition

r = revision to figures in R&D article in August 1992 edition of Economic Trends and to figures in Annual Review of Government Funded R&D 1992.

Note that the table excludes R&D performed abroad funded by UK - this is not part of GERD

Table 4 Gross central government expenditure on R&D

	1986	1987	1988	1989	1990	1991
At current prices (£m)						
Intramural (1)	1207	1256	1348	1524	1556	1614
Extramural (2)	3243	3227	3226	3317	3518	3703
TOTAL GROSS EXPENDITURE	4450	4483	4574	4841	5075	5317
less receipts	188	169	182	203	240	269
Total net expenditure	4263	4314	4392	4638	4835	5048
In real terms (£m 1991 price level)						
Intramural (1)	1678	1654	1655	1756	1660	1614
Extramural (2)	4506	4250	3961	3821	3753	3703
TOTAL GROSS EXPENDITURE	6184	5905	5616	5577	5413	5317
As a percentage of total gross						
Intramural (1)	27	28	29	31	31	30
Extramural (2)	73	72	71	69	69	70
TOTAL GROSS EXPENDITURE	100	100	100	100	100	100

Notes:
(1) A study of MoD's intramural R&D expenditure has shown that some work included in that category does not accord with the internationally accepted Frascati definitions of R&D. Accordingly, these figures have been revised downwards.
(2) Including work performed overseas.
(3) Using the adjusted GDP deflator.

Table 5 Gross central government expenditure on R&D - financial year 1991-92

£m

	Intramural expenditure					Extramural expenditure					Total gross expenditure
	Salaries and wages	Other current costs	Total current costs	Capital costs	Total intramural	Higher education institutions	Private industry and public corporations	Other extramural expenditure	Overseas	Total extramural	
Research Councils											
AFRC	33	48	81	6	87	20	-	-	-	20	106
ESRC	2	1	3	-	4	31	-	-	-	32	35
MRC	80	40	120	19	139	73	-	5	4	82	221
NERC	67	37	103	28	131	26	-	1	2	29	160
SERC	62	60	122	16	138	219	-	-	100	320	458
Total Research Councils	245	184	429	69	498	369	-	6	106	482	980
Higher Education Funding Councils											
UFC	-	-	-	-	- -	919	-	-	-	919	919
PCFC	-	-	-	-	- -	31	-	-	-	31	31
Total Higher Education Funding Councils	-	-	-	-	- -	950	-	-	-	950	950
Civil Departments											
MAFF	45	33	78	6	84	7	2	5	-	15	99
DFE	-	-	1	-	1	22	-	30	-	53	53
ED	4	2	6	-	6	10	13	32	-	55	61
DoE	19	11	30	3	33	7	24	10	-	41	74
DH	11	16	27	7	33	17	2	8	-	27	60
Scottish Office	7	5	12	1	13	10	1	44	-	55	68
DTI	21	21	42	5	48	5	163	12	76	256	304
DEn	1	1	3	-	3	8	109	2	-	119	122
Other civil departments	54	38	92	10	101	29	31	13	13	87	188
Total civil departments	163	127	290	31	321	115	346	157	90	707	1028
Total civil	408	311	719	100	819	1433	346	163	196	2139	2958
MoD(1)	390	264	654	141	795	22	1364	10	168	1564	2359
Total	798	575	1373	241	1614	1455	1710	174	364	3703	5317
of which: Natural Sciences & Engineering	780	562	1342	240	1582	1154	1693	115	360	3322	4904
Social Sciences & Humanities	18	12	31	1	32	301	18	59	3	381	413

Notes: (1) The figure for MOD contains a small amount of expenditure for civil purposes

Table 6 Gross central government current expenditure on intramural R&D by department and type of activity(1)

£m

	1989-90				1990-91				1991-92			
	Basic research	Applied research	Devel-opment	Total	Basic research	Applied research	Devel-opment	Total	Basic research	Applied research	Devel-opment	Total
Research Councils												
AFRC	61.6	28.6	-	90.2	64.7	30.0	-	94.7	56.4	24.2	-	80.5
MRC	-	101.8	-	101.8	-	110.1	-	110.1	-	120.0	-	120.0
NERC	63.9	24.7	-	88.6	25.2	61.6	6.7	93.5	25.2	70.6	7.6	103.4
SERC	44.1	54.3	-	98.4	47.5	58.0	-	105.5	52.1	69.9	-	122.1
Total Research Councils	169.6	209.4	-	379.0	137.4	259.7	6.7	403.8	133.7	284.6	7.6	425.9
Civil departments												
MAFF	6.1	32.8	15.3	54.2	11.1	47.0	14.6	72.7	12.5	40.6	24.4	77.5
DOE	-	26.4	2.6	29.0	0.0	28.8	3.1	32.0	0.0	23.0	4.6	27.6
DH(2)	-	17.0	2.9	19.9	-	18.3	3.4	21.7	-	19.5	3.3	22.8
Scottish Office	1.7	7.3	1.0	10.0	1.7	7.5	0.8	9.9	2.3	7.6	0.8	10.7
DTI	-	23.3	7.8	31.1	-	28.8	9.6	38.4	-	31.7	10.6	42.3
DEn	-	2.0	1.5	3.5	-	2.4	1.8	4.1	0.0	1.3	1.6	2.9
Other civil departments(2)	15.5	43.3	9.1	67.9	14.9	45.7	9.9	70.5	16.4	52.4	11.4	80.2
Total civil departments	23.3	152.1	40.2	215.6	27.7	178.5	43.1	249.3	31.3	176.2	56.7	264.2
Total civil	192.9	361.5	40.2	594.6	165.1	438.2	49.8	653.1	165.0	460.8	64.3	690.1
MOD	-	222.8	366.2	589.0	-	207.3	400.5	607.8	-	236.7	415.1	651.8
Total	192.9	584.3	406.4	1183.6	165.1	645.5	450.3	1260.9	165.0	697.5	479.4	1341.9

(1) Excluding R & D in the social sciences and humanities.
(2) Social security is separated from Health from 1989-90 and included with Other Civil departments.

Table 7 Total personnel engaged on R&D within Government by department

Full time equivalents

Department	1986 Total	1987 Total	1988 Total	1989 Total	1990r Total	1991 Total	of which Researchers	Technicians	Administrative
Research Councils									
AFRC	4856	4626	4286	4211	4000	3480	1856	252	1372
ESRC	101	101	110	111	113	115	-	-	115
MRC	3646	3626	3339	3263	3239	3303	1091	1247	965
NERC	2474	2475	2529	2720	2836	2967	1596	416	955
SERC	2780	2717	2706	2729	2678	2511	1021	168	1322
Total Research Councils	13857	13545	12970	13034	12866	12376	5564	2083	4729
Civil departments									
MAFF	1924	1919	2201	1801	2514	2420	1019	542	859
DoE	897	909	867	890	916	847	451	87	309
DH	-	-	617	628	634	613	298	179	136
Scottish Office	393	399	453	486	490	457	248	99	110
DTI	1194	1162	1003	1000	1000	900	456	113	331
DEn	63	74	80	78	84	62	23	10	29
Other civil departments	3662	3595	3011	3010	2702	2717	1360	558	799
Total civil departments	8133	8058	8232	7893	8340	8016	3855	1588	2573
Total civil R&D	21990	21603	21202	20927	21206	20392	9419	3671	7302
Ministry of Defence	16331	16258	16206	15282	15831	15597	5608	1988	8001
TOTAL	38321	37861	37408	36209	37037	35989	15027	5659	15303

r = revision to figures in R&D article in August 1992 edition of Economic Trends and in to figures in Annual Review of Government Funded R&D 1992.

Table 8 Expenditure on R&D performed by Business Enterprises, by broad Product Groups

						£m	% change
	1986	1987	1988	1989	1990r	1991	1986 to 1991
at current prices							
All product groups	5951	6335	6922	7650	8099	7768	31
All manufactured products	5070	5372	5933	6512	6979	6644	31
Chemicals and pharmaceuticals	1038	1303	1574	1691	1957	1886	82
Mechanical engineering	218	241	225	265	310	310	42
Electronics	2000	1902	2161	2253	2383	2180	9
Other electrical engineering	153	142	147	114	126	102	-33
Motor vehicles	394	451	468	484	501	525	33
Aerospace	830	871	850	1090	1122	1121	35
Other manufactured products	438	463	509	614	579	519	18
Non-manufactured products	880	964	989	1138	1120	1124	28
real terms: 1991 price levels (1)							
All product groups	8269	8345	8498	8813	8639	7768	-6
All manufactured products	7046	7075	7284	7502	7444	6644	-6
Chemicals and pharmaceuticals	1442	1716	1932	1949	2087	1886	31
Mechanical engineering	303	317	276	306	331	310	2
Electronics	2779	2505	2653	2596	2542	2180	-22
Other electrical engineering	212	187	180	131	134	102	-52
Motor vehicles	548	593	575	558	534	525	-4
Aerospace	1153	1147	1044	1256	1197	1121	-3
Other manufactured products	609	610	624	707	618	519	-15
Non-manufactured products	1223	1269	1214	1311	1195	1124	-8

Notes:
(1) Using GDP deflator

Table 9 Expenditure on R&D performed by Business Enterprises: civil/defence split

£m

	at current prices			at 1991 price level (1)		
	1989	1990	1991	1989	1990	1991
Civil						
All product groups	5923	6339	6301	6824	6761	6301
All manufactured products	4872	5314	5264	5613	5668	5264
Chemicals and pharmaceuticals	1673	1944	1870	1927	2073	1870
Mechanical engineering	175	171	160	202	182	160
Electronics	1539	1703	1662	1772	1817	1662
Other electrical engineering	108	121	99	125	129	99
Motor vehicles	476	485	515	548	517	515
Aerospace	335	355	474	386	379	474
Other manufactured products	566	536	485	652	571	485
Non-manufactured products	1051	1025	1037	1211	1093	1037

	1989	1990	1991	1989	1990	1991
Defence						
All product groups	1727	1761	1466	1989	1878	1466
All manufactured products	1640	1665	1379	1889	1776	1379
Chemicals and pharmaceuticals	19	14	17	21	15	17
Mechanical engineering	90	139	150	104	148	150
Electronics	715	680	518	823	725	518
Other electrical engineering	5	5	3	6	5	3
Motor vehicles	8	16	10	10	17	10
Aerospace	755	767	647	870	818	647
Other manufactured products	48	44	34	55	47	34
Non-manufactured products	87	96	87	100	102	87

	1989	1990r	1991	1989	1990r	1991
Total						
All product groups	7650	8099	7768	8813	8639	7768
All manufactured products	6512	6979	6644	7502	7444	6644
Chemicals and pharmaceuticals	1691	1957	1886	1949	2088	1886
Mechanical engineering	265	310	310	306	330	310
Electronics	2253	2383	2180	2596	2542	2180
Other electrical engineering	114	126	102	131	134	102
Motor vehicles	484	501	525	558	535	525
Aerospace	1090	1122	1121	1256	1197	1121
Other manufactured products	614	579	519	707	618	519
Non-manufactured products	1138	1120	1124	1311	1195	1124

Notes:
(1) Using the GDP deflator.
r = revision to figures in R&D article in August 1992 edition of Economic Trends

Table 10 Sources of funds for business enterprise R&D

	Government		Overseas		Mainly own resources		Total
	£m	%	£m	%	£m	%	£m
1986	1392	23	727	12	3832	65	5951
1987	1267	20	760	12	4308	68	6335
1988	1177	17	831	12	4914	71	6922
1989	1312	17	1023	13	5315	69	7650
1990r	1355	17	1255	15	5489	68	8099
1991	1135	15	1240	16	5393	69	7768
of which							
civil	425	7	891	14	4986	79	6301
defence	710	48	349	24	407	28	1466

r = revision to figures in R&D article in August 1992 edition of Economic Trends

Table 11 Business Enterprise Employment on R&D

	Average for year, thousands					
	1986	1987	1988	1989	1990	1991
Scientists and engineers	87	87	89	85	80	75
- of which civil				66	64	62
defence				19	16	12
Technicians, laboratory assistants and draughtsmen	49	49	46	46	41	36
- of which civil				37	33	29
defence				9	8	7
Administrative, clerical, industrial and other staff	52	49	50	45	44	39
- of which civil				36	35	33
defence				9	9	7
TOTAL	188	185	185	176	165	150

TABLE 12 OECD Science and Technology indicators

Gross Expenditure on R&D: International Comparisons

	Year	UK	Germany(1)	France	Italy	Japan(2)	Canada	USA
Gross Domestic Product (GDP)	1986	383.7	478.9	410.5	386.3	845.8	215.8	2306.2
£ billion at ppp (3)	1987	422.3	509.9	440.4	418.4	924.6	235.9	2502.3
	1988	469.7	563.9	489.5	464.2	1047.0	264.1	2774.5
	1989	513.6	624.5	544.1	511.8	1174.2	289.4	3034.3
	1990	548.6	697.4	591.2	555.9	1313.0	305.6	3247.7
	1991	572.4	857.4	660.0	619.7	1502.8	328.9	3524.2
Gross Expenditure on R&D (GERD)	1986	8.8	13.1	9.2	4.4	21.6	3.2	67.2
£ billion at ppp (3)	1987	9.4	14.7	10.0	5.0	24.3	3.3	71.8
	1988	10.2	16.1	11.2	5.6	28.0	3.6	78.7
	1989	11.3	17.9	12.7	6.3	32.8	3.9	84.9
	1990	12.0	19.0	14.3	7.2	37.9	4.4	89.9
	1991	11.9	22.1	16.0 p	8.5 p	42.9	4.8 p	98.0
GERD as a percentage of GDP	1986	2.29	2.73	2.23	1.13	2.56	1.47	2.91
	1987	2.22	2.88	2.27	1.19	2.63	1.42	2.87
	1988	2.18	2.86	2.28	1.22	2.67	1.37	2.84
	1989	2.20	2.87	2.33	1.24	2.80	1.36	2.80
	1990	2.19	2.73	2.42	1.30	2.88	1.44	2.77
	1991	2.08	2.58	2.42 p	1.38 p	2.86	1.46 p	2.78

Source: OECD databank (April 1993).

Notes:
(1) For 1991 there is a break in seies with previous year for which data is available.
(2) Data for Japan are adjusted by OECD.
(3) Converted to £ sterling using OECD purchasing power parities

p = provisional

TABLE 13 OECD Science and Technology Indicators

Government funding of R & D as a percentage of GDP: International Comparisons

TOTAL CIVIL AND DEFENCE	UK	Germany(1)	France	Italy	Japan(2)	Canada	USA
1986	1.11	1.11	1.42	0.72	0.48	0.64	1.28
1987	1.02	1.11	1.39	0.75	0.48	0.57	1.28
1988	0.94	1.06	1.36	0.80	0.46	0.56	1.23
1989	0.90	1.06	1.34	0.73	0.46	0.56	1.21
1990	0.88	1.04	1.42	0.74	0.45	0.60	1.18
1991	0.88	0.98	1.42 p	0.75 p	0.45	0.60 p	1.19

CIVIL	UK	Germany(1)	France	Italy	Japan(2)	Canada	USA
1986	0.61	0.98	0.94	0.66	0.46	0.59	0.39
1987	0.57	0.97	0.89	0.70	0.46	0.53	0.40
1988	0.54	0.93	0.86	0.72	0.44	0.51	0.40
1989	0.51	0.93	0.83	0.66	0.43	0.52	0.42
1990	0.51	0.90	0.85	0.69	0.43	0.55	0.44
1991	0.49	0.87	0.89 p	0.70 p	0.42	0.56 p	0.48

DEFENCE	UK	Germany(1)	France	Italy	Japan(2)	Canada	USA
1986	0.50	0.13	0.48	0.06	0.02	0.04	0.88
1987	0.45	0.14	0.50	0.05	0.02	0.04	0.88
1988	0.40	0.13	0.51	0.08	0.02	0.05	0.83
1989	0.39	0.14	0.50	0.08	0.02	0.04	0.79
1990	0.37	0.14	0.57	0.05	0.02	0.04	0.74
1991	0.40	0.11	0.53 p	0.06 p	0.03	0.04 p	0.71

Source: OECD databank (April 1993)

Notes:
(1) For 1991 there is a break in series with previous year
(2) Data for Japan are adjusted by OECD

p = provisional