University and College Union

‘Further, higher, better’

Submission to the government’s second Comprehensive Spending Review

Section 9

9 Research and development

Spending on science

The most dramatic increase in public spending relating, in part at least, to higher education, has been in the government's science budget, which has risen from £1.3bn to £3.5bn since 1997, an increase of 159% in cash terms. Approximately half of the science budget is spent on research undertaken by UK higher education institutions. As part of government spending on research sustainability, the science budget includes £120m for the full economic costing of research in 2005-6, the same amount in 2006-7 and £200m in 2007-8.

Public spending on science 1997-2008, UK

	Science budget	
Year	**£m cash**	**% change**
1997-98	1331	
1998-99	1334	0.2%
1999-00	1394	4.5%
2000-01	1514	8.6%
2001-02	1707	12.7%
2002-03	1947	14.1%
2003-4	2310	18.6%
2004-5 est	2735	18.4%
2005-6 plans	3087	12.9%
2006-7 plans	3235	4.8%
2007-8 plans	3452	6.7%
1997-2008 % change	159.3%	

Source: to 2003-4: http://www.ost.gov.uk/setstats/2/t2_1.htm; to 2007-8 http://www.ost.gov.uk/research/funding/budget05-08/allocations.pdf. Percentage calculations by UCU.

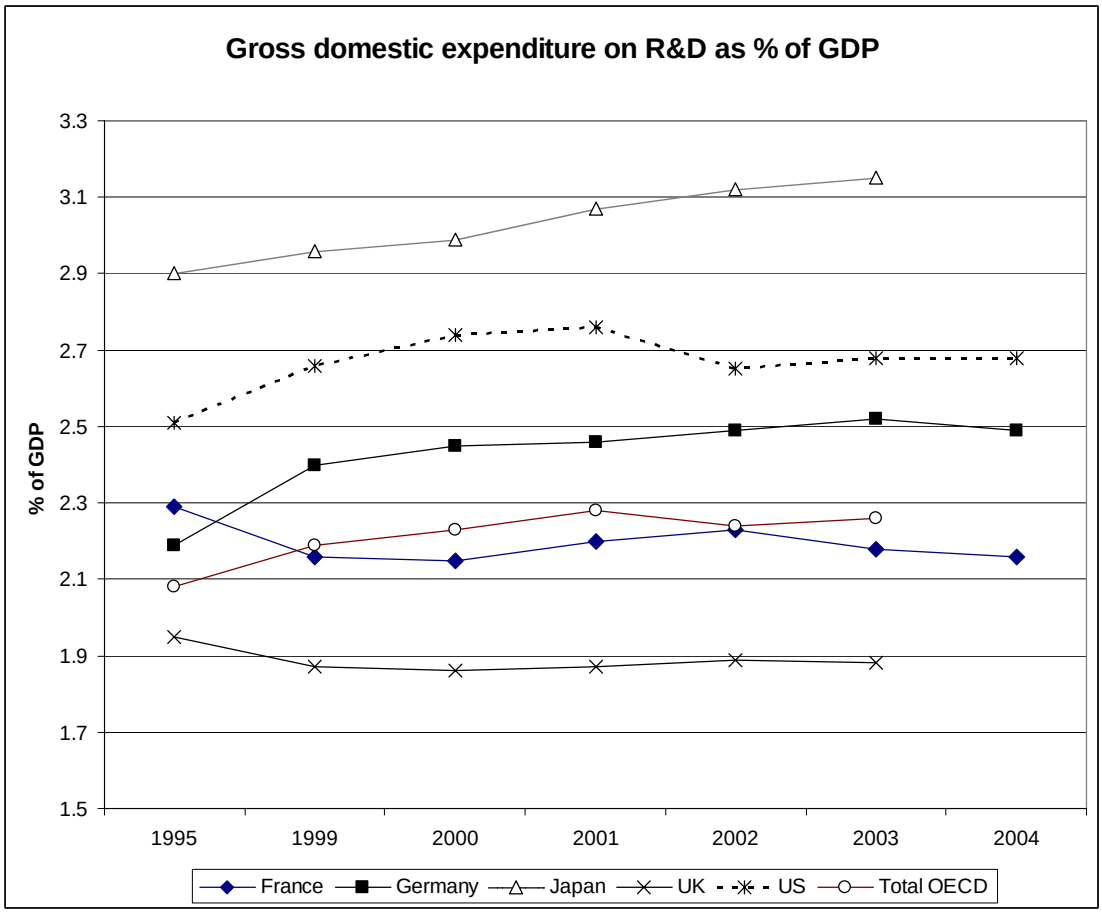
International comparators

However, current UK spending on research and development is well below the level of our main competitor nations. In 2003, gross domestic expenditure on R&D as a percentage of GDP was 1.88% in the UK, compared with France (2.18%), OECD countries overall (2.26%), Germany (2.52%), the US (2.68%) and Japan (3.15%). Ten years ago, the proportion of GDP spent on R&D in the UK was higher than in 2003, whereas spending trends for Germany, Japan and the US have generally been upwards.

Gross domestic expenditure on research and development as % of GDP

	1995	1999	2000	2001	2002	2003	2004
	% of GDP	% of GDP	% of GDP	% of GDP	% of GDP	% of GDP	% of GDP
France	2.29	2.16	2.15	2.20	2.23	2.18	2.16
Germany	2.19	2.40	2.45	2.46	2.49	2.52	2.49
Japan	2.90	2.96	2.99	3.07	3.12	3.15	-
UK	1.95	1.87	1.86	1.87	1.89	1.88	-
US	2.51	2.66	2.74	2.76	2.65	2.68	2.68
Total OECD	2.08	2.19	2.23	2.28	2.24	2.26	-

Source: OECD Main Science & Technology Indicators 2005/2, table 02



Source: OECD Main Science & Technology Indicators 2005/2, table 02

Sources of R&D funding

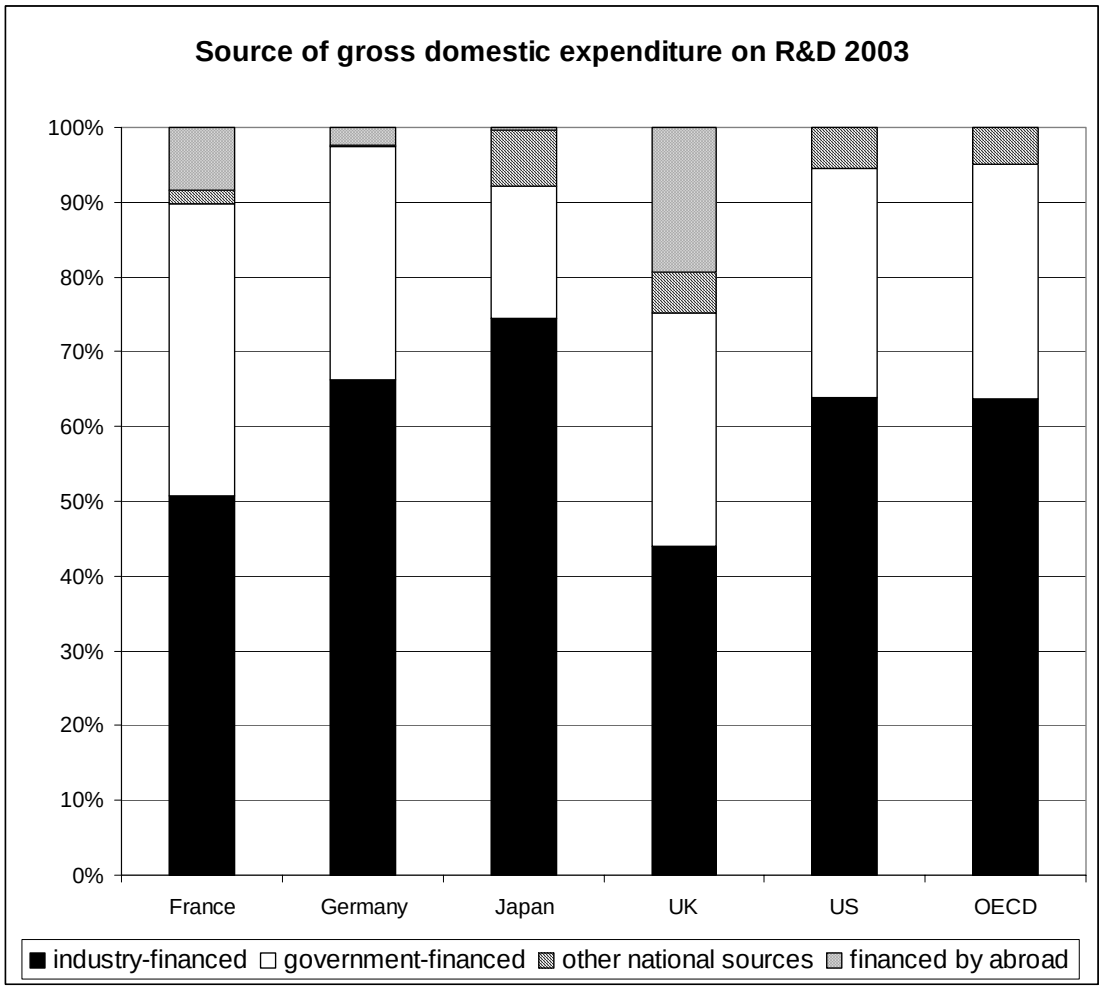
In terms of the sources of spending on R&D, there are major differences between the UK and competitor economies. Half to three-quarters of gross domestic expenditure on R&D in France, Germany, Japan, the US and the OECD as a whole was industry-financed in 2003. In the UK, only 44% of expenditure came from industry. Levels of government spending and spending from other national sources in the UK were relatively similar to the OECD as a whole. By contrast, the proportion of R&D in the UK financed by abroad was nearly 20% in 2003 – much higher than competitors for whom data were available.[28]

Source of gross domestic expenditure on R&D 2003

	France	Germany	Japan	UK	US	OECD
	%	%	%	%	%	%
industry-financed	50.8	66.3	74.5	43.9	63.8	61.8
government-financed	39.0	31.2	17.7	31.3	30.8	30.4
other national sources	1.8	0.3	7.5	5.4	5.4	4.8
financed by abroad	8.4	2.3	0.3	19.4		
Total	100.0	100.1	100.0	100.0	100.0	97.0

OECD Main Science & Technology Indicators 2005/2, tables 13-16

Source of gross domestic expenditure on R&D 2003



OECD Main Science & Technology Indicators 2005/2, tables 13-16; calculations by UCU

Spending on R&D by industry

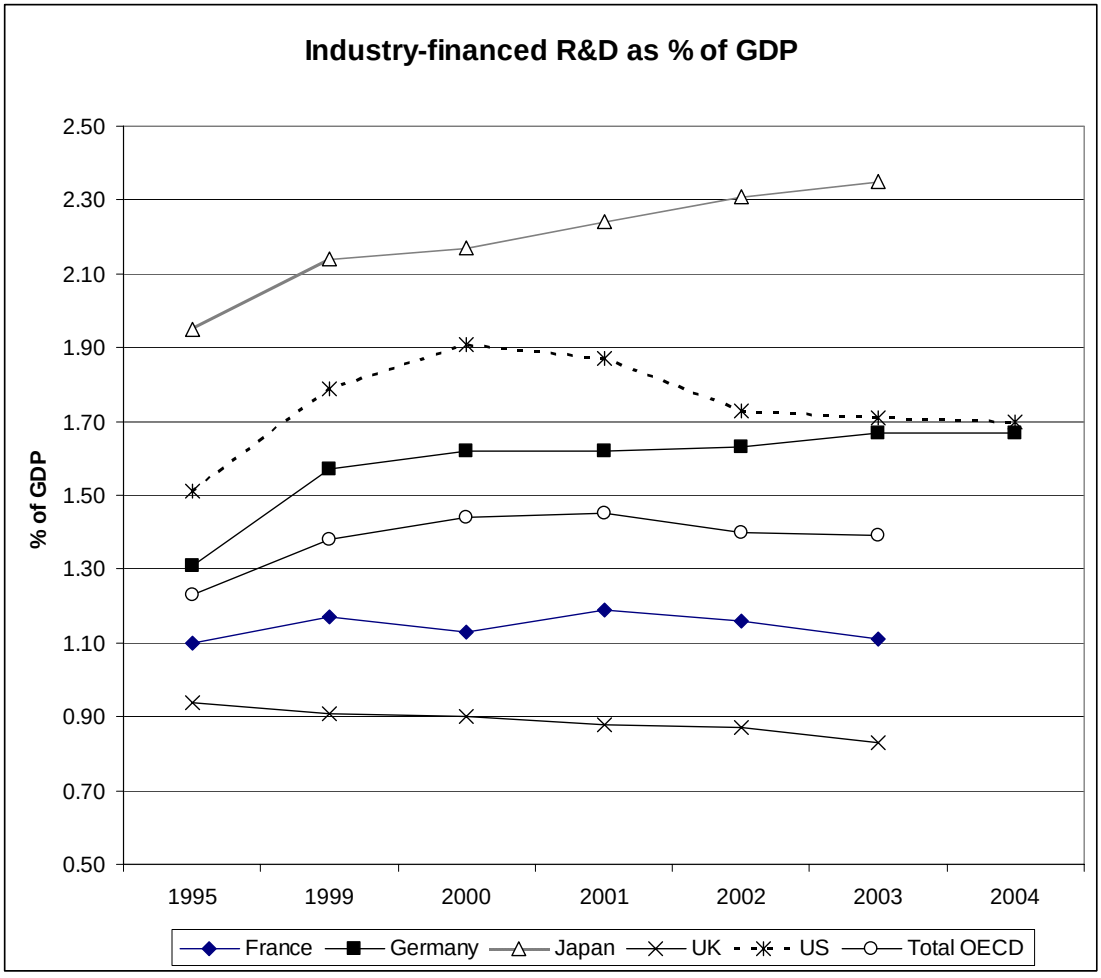
While spending on R&D by industry is generally rising as a proportion of GDP in Germany, Japan, the US and the OECD overall, it is falling in the UK.

Industry-financed gross domestic expenditure on R&D as % GDP

	1995	1999	2000	2001	2002	2003	2004
France	1.10	1.17	1.13	1.19	1.16	1.11	
Germany	1.31	1.57	1.62	1.62	1.63	1.67	1.67
Japan	1.95	2.14	2.17	2.24	2.31	2.35	
UK	0.94	0.91	0.90	0.88	0.87	0.83	
US	1.51	1.79	1.91	1.87	1.73	1.71	1.70
Total OECD	1.23	1.38	1.44	1.45	1.40	1.39	

Source: OECD Main Science & Technology Indicators 2005/2, table 11.

Industry-financed gross domestic expenditure on R&D as % GDP



Source: OECD Main Science & Technology Indicators 2005/2, table 11.

Comment

We welcome the increased level of spending in the science budget, and the government's strategy for science set out in 'Science and innovation investment framework 2004-14', particularly to increase the level of investment in research and development from around 1.9% of GDP in total to

2.5%. We also welcome investment in university-business links and knowledge transfer, and recent tax credits to encourage research and development by companies.

But we cannot afford to stand still. In his 2006 State of the Union address, US President George Bush said: 'We must continue to lead the world in human talent and creativity.' He announced an American Competitiveness Initiative, which included doubling the federal commitment to the most critical basic research programs in the physical sciences over the next 10 years. He said: 'This funding will support the work of America's most creative minds as they explore promising areas such as nanotechnology, supercomputing, and alternative energy sources.' [29]

It is clear from the data in this section that a major weakness in UK expenditure on research and development relates to the relatively small proportion of R&D spending by industry. Although recent Budgets have extended R&D tax credits to businesses, more needs to be done to stimulate business R&D, to promote knowledge transfer and to ensure that there is an adequate supply of trained school, college and university leavers to ensure economic survival and success. We recommend an investigation to determine the impact on the UK economy of the current high levels of R&D spending coming from abroad.

We welcome the government's commitment to supporting the stipend of PhD students in science, but would urge the government to consider increasing the stipend at above the rate of inflation if more home domiciled PhD students in veterinary science, chemistry, physics and mathematics, in particular, are to be attracted into the academic profession. As a step towards building up the UK's future strength in research and development we welcome the government's programme, announced in the 2006 Budget, for the recruitment, retraining, retention and reward of 3,000 science teachers; a new entitlement to study the full range of science subjects at GSCE level; and the funding of after school science clubs starting in 250 schools.