Business boosts R&D investment

Rank	Sector	Spend (€bn)	Change on last year (%)	Share of total R&D spend (%)	R&D intensity of sector (%)
1	Pharmaceuticals and biotechnology	70.5	15.7	19.3	15.9
2	Technology hardware and equipment	64.5	13.1	17.6	8.6
3	Automobiles and parts	60.8	1.5	16.6	4.1
4	Electrical and electronic equipment	27.1	4.9	7.4	4.4
5	Software and computer services	26.5	13.2	7.3	9.8
6	Chemicals	17.2	9.6	4.7	3.1
7	Aerospace and defence	16	12.4	4.4	4.8
8	Leisure goods	14.2	-1	3.9	6.5
9	Industrial engineering	9.3	11.5	2.5	2.7
10	General industrials	8.9	8	2.4	2.1
11	Fixed-line telecoms	7.3	12.9	2	1.6
12	Healthcare equipment and services	6.4	17.3	1.8	6.8
13	Oil and gas producers	4.9	20.5	1.3	0.3
14	Food producers	3.9	7.6	1.1	2.2
15	Household goods	3.9	7.2	1.1	1.6
	Top 15 sectors	341.6	9.7	93.4	4.2
	Other 22 sectors	24.2	13.9	6.6	0.9
	TOTAL	365.8	10	100	3.4

Source: The 2007 EU Industrial R&D Investment Scoreboard

Global corporate investment in R&D grew by 10% last year, according to the 2007 edition of the European Commission's annual analysis. EU-based companies increased their R&D investment by 7.4%, compared to 5.3% in the 2006 edition.

The EU Industrial R&D Investment Scoreboard uses figures from company accounts and shows the investment made by a company from its funds. It covers the top 1000 R&D companies from the EU and the top 1000 R&D companies from the rest of the world. Together, the 2000 Scoreboard companies invested €372 billion in R&D, or an estimated 85% of global corporate R&D expenditure.

R&D investment by EU companies is still growing more slowly than non-EU counterparts, which has been true since the EU started publishing its scoreboard. Part of this is due to the different mix of business activities within and beyond the EU: the US and Japan are home to more fast-growing and research-intensive industries than the EU. In contrast, the EU recorded the highest growth in fixed capital investment, reflecting its focus on mid-technology industries such as car making.

The EU scoreboard also shows that the pharmaceuticals and biotechnology sector has overtaken technology hardware and equipment as the sector attracting the most R&D investment. Companies in this sector are clearly feeling the pressure to innovate: Merck increased its R&D investment by 24.3%, both AstraZeneca and Roche by 15.5%, Johnson & Johnson by 12.9%, and GlaxoSmithKline by 10%.

R&D money is flowing back into the chemicals sector, with investment up 9.8% compared to a decline in the previous year. This is especially true in EU chemical companies, where R&D investment has risen by an average 17%. Some companies have spent considerably more, in part reflecting acquisitions and consolidation in the sector. Bayer boosted spending by 30.3%, Solvay by 20.3% and BASF by 19.8%.

The aerospace and defence sector continued to raise R&D investment more than average, by 12.5%. The sector's most representative companies, EADS and Boeing, increased their R&D investment by 21.2% and 47.7%, respectively.

Adding to this autumn's flood of innovation data, the UK Department for Business Enterprise and Regulatory Reform (formerly the Department of Trade and Industry) has just published its R&D scoreboard, of the top 850 UK and top 1250 global companies ranked by R&D investment. It highlights the increasing concentration of R&D by company, sector and geography.

Globally, the 1250 biggest investors in R&D spent €339 billion in 2006-7, 10% more than the previous year. More than 81% of global R&D occurs in just five countries, USA, Japan, Germany, France and the UK, which together contributed 81% of the G1250 R&D spend. Global average R&D intensity remains at 3.5% of sales.

More than half of R&D activity by the 75 UK companies represented in the G1250 is in pharmaceuticals and aerospace. The UK's fixed-line telecommunications sector showed the fastest growth in R&D spending over the last year – up 54% on last year. Firms in mobile telecommunications and banking reported average R&D growth of around 40%.

The smallest companies in the UK850 are doing more R&D: 95 more firms invested more than €700,000 (£0.5m) in R&D this year than last. R&D growth has outstripped sales growth for the UK850, increasing the group's R&D intensity.

The OECD's latest science, technology and industry scoreboard provides a more qualitative feel for the way R&D is changing world-wide.

It says that R&D expenditure in the OECD area has kept pace with the growth of GDP since 2001, at about 2.25% of overall GDP.

In both Japan and the EU, R&D intensity increased in 2005, to 3.3% and 1.7%, respectively, following a drop in 2004. In the United States, R&D intensity declined from 2.7% in 2001 to 2.6% in 2006, mainly due to stronger GDP growth than in the other regions. And in 2005, China became the third strongest R&D spender world wide, in purchasing-power parity terms, after the US and Japan, increasing its R&D spend by more than 18% a year between 2000 and 2005.

OECD countries are also changing the way they encourage innovation. In 2005, government financed an average of 7% of business R&D, down from 11% in 1995, favouring tax relief instead. In 2006, 20 OECD countries offered tax relief for business R&D, up from 12 in 1995.

Business accounts for most R&D in OECD countries in terms both of who does it and who pays for it, at 63 and 68%, respectively, of the total. Business is contributing a higher proportion of R&D spend in 2005 than it was in 1995, at 2.5% of GDP in Japan, 1.7% in the United States and 0.9% in the EU.

Venture-capital investment in R&D represents about 0.12% of OECD-wide GDP in 2005, up from 0.1% in 2003. Venture-capital investment is growing rapidly in the Nordic countries but remains concentrated in the UK and US, which together attracted half of all such investment in the OECD.

The US, Europe and Japan remain at the forefront of world science with 30%, 33% and 8%, respectively, of total scientific publications. China ranks sixth world-wide in terms of publications and has raised its share in triadic patents (those filed in the EU, US and Japan) from close to zero in 1995 to 0.8% in 2005.

Patent data show that emerging economies (India, China, Israel, Singapore) and the US focus their efforts on high-technology industries such as computers, and pharmaceuticals, while continental Europe concentrates on medium-high-technology industries such as automobiles and chemicals.

Since the early 1990s, cross-border ownership of inventions has expanded from 11% to 16% of total patented inventions. International co-authorship of scientific publications increased threefold between 1995 and 2005. Cross-border co-operation on inventions nearly doubled as a share of global total inventions, from less than 4% to more than 7% between 1991-93 and 2001-03. Foreign ownership of domestic patents increased by 50% over the same period.

The OECD study also shows that EU countries interact most often with each other and are less globalised than the US. R&D performed abroad and by foreign affiliates represents more than 16% of total industrial R&D expenditure in the OECD area. The average R&D intensity of affiliates under foreign control is higher than the R&D intensity of domestically controlled firms in most countries. This is the case in Japan, Sweden, the US and the UK.

Management consultancy Booz Allen Hamilton has recently published its third annual analysis of the world's top 1000 R&D investors. Many of its findings correlate with those of the OECD, EC or the UK scoreboards.

Its analysis suggests that the companies that get the best return from their R&D do so because it is tightly aligned to their strategic goals, and because they focus on understanding their customers throughout the innovation process.

Strikingly, though, the Booz Allen study shows that money alone cannot buy effective innovation. As in its previous studies, Booz Allen found no statistically significant relationships between R&D spending and the primary measures of financial or corporate success, including sales and earnings growth, gross and operating profitability, growth of market capitalisation, and total shareholder returns.

Links

2007 EU Industrial R&D Investment Scoreboard
http://iri.jrc.ec.europa.eu/research/docs/2007/sb_2007.pdf

UK Department for Business Enterprise and Regulatory Reform 2007 R&D Scoreboard
http://www.innovation.gov.uk/rd_scoreboard/

OECD Science, Technology and Industry Scoreboard 2007
http://www.oecd.org/document/10/0,3343,en_2649_33703_39493962_1_1_1_1,00.html

Booz Allen Hamilton report
http://www.boozallen.com/media/file/Global_Innovation_1000_2007_v2.pdf