

18th May 2006

AMENDMENT

ONS advised, on 18th May, that due to respondent data error, revisions will be made to their R&D publication figures for 2004. While these figures will not be significant to the UK headline figures, revisions to the Scottish figure for total BERD are likely.

It is anticipated that the revised data will be published by late summer 2006.

The above should be taken into account when using UK and UK regional figures in the NI R&D statistics 2004 publication (in particular Table 6, page 9).



Department of
**Enterprise, Trade
and Investment**
www.detini.gov.uk

Business Activity

Statistics Bulletin

Northern Ireland Research & Development Statistics 2004

25 November 2005

A NATIONAL STATISTICS PUBLICATION

National Statistics are produced to high professional standards set out in the National Statistics Code of Practice. They undergo regular quality assurance reviews to ensure that they meet customer needs. They are produced free from any political interference.

For general enquiries about National Statistics, contact
The National Statistics Public Enquiry Service on 0845 601 3034
minicom: 01633 812399
E-mail: info@statistics.gov.uk
Fax: 01633 652747
Letters: Room 1015, Government Buildings, Cardiff Road, Newport,
Gwent, South Wales NP10 8XG

You can also find National Statistics on the internet – go to
www.statistics.gov.uk

NORTHERN IRELAND RESEARCH AND DEVELOPMENT STATISTICS 2004

Published 25th November 2005

- **Total expenditure on Research and Development in Northern Ireland was £272.7 million in 2004, of which £124.3 million (45.6%) was spent by businesses, £136.1 million (49.9%) by the Higher Education sector and the remainder (£12.3m) was Government expenditure.**
- **There was a rise of £10.9 million (4.2%) in cash terms and a rise of £5.3 million (2.0%) in real terms in Northern Ireland total R&D expenditure between 2003 and 2004 (from £267.4m to £272.7m).**
- **For the second consecutive year in 2004 Northern Ireland Higher Education accounts for a greater share of total R&D expenditure (49.9%) than the Business sector (45.6%).**
- **Both Northern Ireland Business and Higher Education R&D expenditure rose in real terms, the former by £0.5 million (0.4%) and the latter by £5.5 million (4.2%).**
- **In cash terms total business R&D expenditure in 2004 was £124.3 million, up £3.1 million (2.5%) on the previous year.**
- **Within company expenditure (intramural), a subset of business R&D expenditure, fell by 0.8% in cash terms in Northern Ireland from £116.5 million to £115.5 million. Such spending in the UK fell by 1.3%.**
- **There was a slight fall (4.3%) in R&D expenditure by the Manufacturing sector from £86.6 million in 2003 to £82.8 million in 2004. This was more than compensated for by the rise in R&D expenditure by Services and other sectors, which rose by 19.6% from £34.7 million to £41.5 million in the same period.**
- **Expenditure by small sized firms (less than 50 employees) accounted for both greater expenditure and a greater proportion of total R&D expenditure in 2004 than in 2003 (£35.1 m (28.2%) in 2004 compared with £26.5m (21.9%) in 2003).**

Department of Enterprise,
Trade and Investment

Northern Ireland Research & Development Statistics 2004

25 November 2005

Crown Copyright

Contents

1
Executive Summary
Pages 1-3

2
Introduction
Pages 4-5

3
Business Expenditure
on Research &
Development in 2004
Pages 6-15

4
Research &
Development
information from
other sources
Page 16

5
Business Expenditure
on Research &
Development in the
Republic of Ireland
Page 17

6
Business Expenditure
on Research &
Development – Notes
to Editor
Pages 18-20

7
Northern Ireland
Higher Education
Expenditure on
Research &
Development during
2004
Pages 21-22

8
Higher Education
Expenditure on
Research &
Development – Notes
to Editor
Page 23

9
Annexes
Pages 24-26

Executive Summary

1

1. Introduction

This bulletin provides information on the level of Research & Development (R&D) activity in Northern Ireland. R&D activity contributes to the development of new technologies, products and processes and is a key driver of productivity growth. The Northern Ireland R&D surveys cover the business sector, higher education and other government financed activities.

It includes information on:

- The level of R&D;
- Sources of funding for R&D;
- Employment in R&D.

and provides important indicators of the extent to which Northern Ireland companies and higher education establishments are investing in the activities that underlie future economic development.

Sample Design

For the Business R&D Survey the sample is obtained by stratifying companies by the known level of R&D performance using information gained from previous surveys and other sources. All companies believed to be performing R&D are issued a questionnaire - in effect, therefore, a 'census' of known R&D performers was carried out. A total of 526 returns were received by the Department – some 93% of those sampled.

2. Total Expenditure on R&D in cash terms

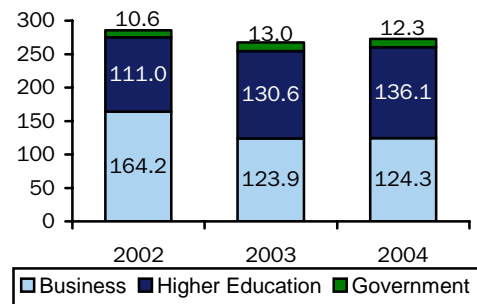
Total expenditure on Research and Development in Northern Ireland in cash terms was £272.7 million in 2004, of which £124.3 million (46%) was spent by businesses, £136.1 million (50%) by the Higher Education sector and the remainder was other government expenditure.

3. Total expenditure on R&D in real terms

In 2004 Northern Ireland Higher Education accounted for a greater share of total R&D expenditure (50%) than the Business sector (46%) as in 2003 (49% and 46%) respectively.¹

In real terms, total expenditure increased by £5.3m or 2% between 2003 and 2004, when the total expenditure was £272.7m.

Figure 1
Main split of R&D expenditure in Real Terms



Both Northern Ireland Higher Education expenditure and expenditure by businesses rose in real terms. Higher education expenditure increased by £5.5 million (4%) and expenditure by business increased by £0.5m from £123.9m to £124.3m. There was a fall in real terms (-5%) in Northern Ireland Government expenditure on R&D between 2003 and 2004 (from £13.0m to £12.3m).

Overall R&D business expenditure rose by 8% between 1999 and 2004 in real terms.

Detailed analysis of company spend in the rest of the survey is undertaken in cash terms, except where otherwise stated.

Whilst a decrease in spending of £4m (4%) occurred in the Manufacturing sector, this was

¹ Higher Education figures are not available prior to 2001

more than offset by an increase in expenditure of £7m (20%) in the Services and Other sector.

The importance of large companies to R&D expenditure has been falling in recent years. Medium sized firms (those firms with between 50 and 499 employees) accounted for a similar proportion of R&D expenditure in 2004 as large firms (35% and 37% respectively). The proportion that large firms make to total R&D expenditure was similar to last year (38%) but lower than in 2002 (50%) and 2001 (65%).

R&D expenditure by locally-owned companies decreased by 1% (£0.5m) between 2003 and 2004 in contrast to the rise of 6% (£3.6m) by foreign-owned companies.

4. Business R&D: Intramural Expenditure

Spending carried out within a company in Northern Ireland (intramural), accounted for 93% (£115.5 million) of total expenditure in 2004. Intramural expenditure fell by 0.8% between 2003 and 2004.

5. Business R&D: Sectoral Analysis

In 2004, the majority of R&D was carried out within the manufacturing sector (67%) with the remaining 33% carried out in services and the 'other' industries categories. This shows an increased share of expenditure in the services & other sector compared to previous years (for example, in 2003, manufacturing accounted for 71% and services & other 29%).

Manufacturing expenditure in 2004 (£83m) was down by 4% on 2003.

6. Business R&D: by Company Size

The importance of large companies to R&D activity has been declining over the last few years; while companies with more than 500 or more employees accounted for 37% of total business R&D expenditure in 2004, compared to 38% of total spend in 2003, 50% in 2002 and 65% in 2001.

Such companies represented only 7% of the total number of firms that performed R&D in 2004, compared with 7% in 2003 and 6% in 2002.

The importance of medium sized companies (50-499 employees) has decreased over the past year. The proportion of R&D expenditure carried out by medium sized companies decreased from 40% in 2003 to 35% in 2004. The actual R&D

expenditure decreased in cash terms from £48.9 million in 2003 and to £43.1 million in 2004.

7. Business R&D: Source of funds

The majority of funding came from companies' own funds (77%), with 15% from Government, 2% from overseas and 6% from other sources. The proportion of funding from own funds fell from 82% in 2003 to 77% in 2004.

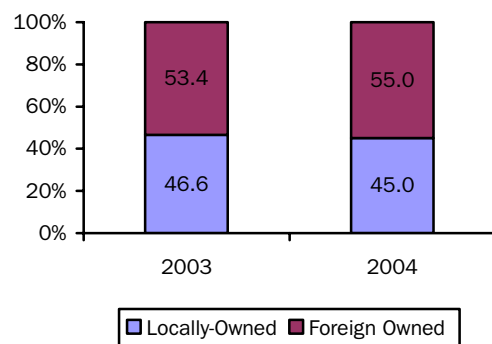
8. Business R&D: Ownership

Companies with ownership outside NI play an important role in financing R&D activities in the region. Over half, £68.4m (55%) of total R&D spend was by such foreign owned companies although they accounted for under a quarter (23%) of all R&D-performing companies. Their contribution to the total R&D spend was higher than in 2003 (£64.8m or 53%).

The majority of R&D expenditure in Manufacturing is carried out by foreign-owned companies (66.2%), whereas the converse is true for services and 'other' sector (32.7%).

The majority of locally-owned companies funding came from their own funds in Northern Ireland (69%), higher than for foreign-owned companies (40%).

Figure 2
Expenditure by Ownership 2003-2004
(percentages)



9. Business R&D: Employment

In 2004, companies surveyed reported a total of 2,880 employees working on R&D, some 5.6% of all employees in companies carrying out R&D. The whole time equivalent figure (WTE) for the same period was 2,660.

The number of R&D employees fell between 2003 and 2004, after having increased every year from 2001.

Table 1: R&D Employment

	2001	2002	2003	2004
Number	2,630	2,720	2,930	2,880
WTE	2,480	2,590	2,770	2,660

Approximately 85% of all R&D employees were full-time. Of all R&D employees, 69% were scientists, 15% were technicians and other employees accounted for 16% of such employees.

10. Intramural Business R&D: UK and Regional Comparisons

Of the 12 UK regions, six showed a rise in intramural business R&D expenditure in cash terms over the period 2003-2004 and six showed a fall, including NI which fell by 0.8% to £115.5m. In the UK as a whole such expenditure fell by 1.3%. Changes varied from an increase of 36% in the West Midlands to a decrease of 14% in Eastern region.

Over the two year period 2002-2004, intramural business R&D expenditure in cash terms in Northern Ireland fell by 22%, the largest fall of the five UK regions which showed a decrease. In the UK as a whole such expenditure rose by 3%.

11. Higher Education R&D: Summary

R&D expenditure in the Higher Education sector increased by 6% in cash terms between 2003 and 2004 (from £129.1m to £136.9m) reflecting its importance to Northern Ireland. Net expenditure in 2004 (excluding spend by businesses undertaken by higher education) was £136.1m.

Over one half of funding (51%) for Higher Education R&D in 2004 came from the Government block grant (£70.2 million). In 2004, there were some 1,850 full-time equivalent employees in the Higher Education sector engaged in R&D, remaining unchanged on the number of employees in 2003.

12. R&D Investment Rate

The most recent information for R&D expenditure as a percentage of Regional Gross Value Added relates to 2003. This shows that Northern Ireland

was the second lowest of the twelve UK regions (a lower proportion was recorded only in London). The proportion for NI in 2003 at 0.53% is just over one third the UK average of 1.40%. Northern Ireland businesses would have needed to invest some £191 million more in R&D in 2003 to reach the UK average rate.

13. Other Sources

The most recent UK Innovation (2001) Survey estimated that 46% of all NI businesses had undertaken some form of innovation activity over the 3-year sample period (1998-2000) compared to 47% of all firms in the UK. In addition, the survey showed that 32% of enterprises in NI undertook innovation related expenditure, slightly below the UK average of 36%. Results from the 2005 Innovation Survey are not yet available.

Further details from this survey are available at www.dti.gov.uk/iese/regional2001b.pdf.

According to the 2003 Northern Ireland Annual Business Inquiry (NIABI) 7% of companies had someone in their business engaged in research and development work during the year. This is the same proportion as reported by the 2002 NIABI. The Manufacturing sector was the sector with the highest proportion (17%), while the proportion in the service sector was 3%. The 2004 NIABI is due to publish results in Dec 2005.

Introduction

2

The performance and funding of most research & development (R&D) activity occurs in four main economic sectors:- the Business sector, Higher Education Institutions, Government and the Private Non-Profit sector.

The Department of Enterprise, Trade and Investment (DETI) carries out annual surveys of R&D expenditure in the Business sector and Higher Education Institutions in Northern Ireland (see Sections 3 and 7 respectively of this Statistics Bulletin). Information on Government R&D comes from an annual survey conducted by the Office for National Statistics (ONS), which is addressed to all Government departments, including those in Northern Ireland².

One area that is not covered by the present suite of surveys in Northern Ireland is the Private Non-Profit sector. However, previous analysis by ONS shows that only around 1% of total R&D in the UK was carried out within this sector.

Headline results from the surveys are provided in both cash and real terms while detailed analysis is provided mainly in cash terms.

RESULTS

Total expenditure on Research and Development in Northern Ireland in cash terms was £272.7 million in 2004, of which £124.3 million (45.6%) was spent by businesses, £136.1 million (49.9%) by the Higher Education sector and the remainder was other government expenditure.

Total expenditure in 2004 (£272.7m) was 4% higher than that in 2003 (£261.8) and was similar to that in 2002 (£272.6m)

Table 2: Total Expenditure on R&D³ in cash terms (£million)

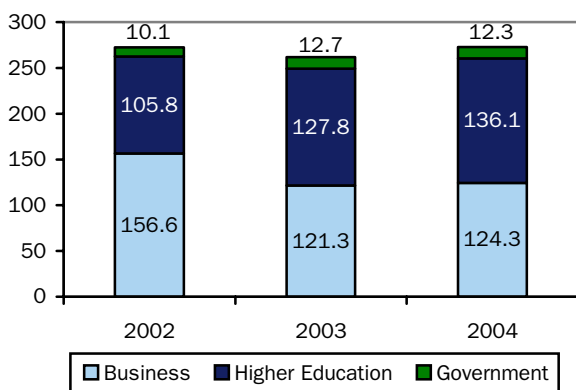
	2002	2003	2004
Total expenditure on R&D (of which)	272.6	261.8	272.7
Expenditure by businesses	156.6	121.3	124.3
Expenditure by Higher Education⁴	105.8	127.8	136.1
Other expenditure by Government⁵	10.1	12.7	12.3

² The latest details are available on the Office for Science and Technology's website at www.ost.gov.uk/setstats/index.htm

³ Figures contained within all tables in this Bulletin may not add due to rounding.

⁴ To avoid double counting, this figure excludes £0.9m in 2004, £1.2m in 2003, £1.6m in 2002 of expenditure on R&D by businesses that was undertaken by universities or higher education establishments.

Figure 3: Main Split of R&D Expenditure in cash terms (£million)



In 2004 expenditure by Higher Education was higher than Business (49.9% and 45.6% respectively), as in 2003 (48.8% and 46.3%), while in 2002 expenditure by businesses was more than that by the Higher Education sector (57.5%).

Table 3: Total Expenditure on R&D in real terms⁶ (£million)

	2002	2003	2004
Total expenditure on R&D (of which)	285.7	267.4	272.7
Expenditure by businesses	164.2	123.9	124.3
Expenditure by Higher Education⁷	111.0	130.6	136.1
Other expenditure by Government⁸	10.6	13.0	12.3

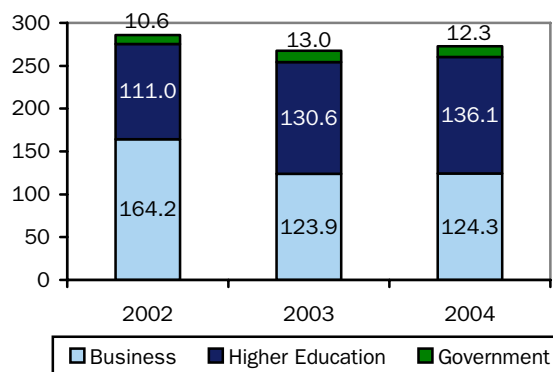
⁵ 2003/04 Forward Look expenditure by NI Departments (see Notes to Editors, note 5) excluding grants to businesses to conduct R&D and funding to higher education institutions. The figure does not include expenditure by higher education establishments as this is detailed separately.

⁶ GDP deflator used to convert cash terms to real terms: 95.4 (2002) and 97.9 (2003) where 2004 = 100

⁷ To avoid double counting, this figure excludes £0.9m in 2004, £1.2m in 2003, £1.6m in 2002 of expenditure on R&D by businesses that was undertaken by universities or higher education establishments.

⁸ 2003/04 Forward Look expenditure by NI Departments (see Notes to Editors, note 5) excluding grants to businesses to conduct R&D and funding to higher education institutions. The

Figure 4: Main Split of R&D Expenditure in real terms (£million)



In real terms total expenditure in 2004 (£272.7m) has increased by 2.0% (£5.3m) from expenditure in 2003 (£267.4m).

Both expenditure by Business and by Higher Education increased over the year to 2004. In real terms, expenditure by Business increased by £0.5m (0.4%) whilst expenditure by Higher Education increased by £5.5m (4.2%).

There was a fall in real terms (-4.9%) in R&D expenditure by Government between 2003 and 2004 (from £13.0 to £12.3m).

figure does not include expenditure by higher education establishments as this is detailed separately.

Business Expenditure on Research & Development in 2004

3

Table 4 details the headline results from the 2004 Business Expenditure on Research & Development (BERD) survey. The table shows that in 2004, total expenditure (in cash terms) on R&D by Northern Ireland businesses was an estimated £124.3 million.

Total BERD consists of intramural expenditure (i.e. R&D carried out within the company) and extramural expenditure (i.e. R&D funded by firms in Northern Ireland but undertaken by other firms in the UK and abroad). The vast majority of total BERD was intramural expenditure (£115.5m or 92.9%) with £8.8m or 7.1% being extramural expenditure which increased from £4.8m in the previous year. Of this £8.8m of extramural expenditure in Northern Ireland, some £0.9m was undertaken by the Higher Education sector.

76.8% of funding for R&D in 2004 came from the companies' own resources (£95.5m) while government provided a further 15.2% (or £18.9m) and the remainder came from overseas (1.6% or £2.0m) and other sources (6.3% or £7.9m).

Table 4: Business Expenditure on R&D - 2004

	Total Expenditure by Business (£million)	As % of Total Expenditure
Total Expenditure	124.3	100.0
Intramural Expenditure ⁹	115.5	92.9
of which:		
Current Expenditure	100.2	80.6
Capital Expenditure	15.3	12.3
Extramural Expenditure ¹⁰	8.8	7.1
Of which:		
Undertaken by Higher Education	0.9	0.7
Source of funding:		
Business	95.5	76.8
Government	18.9	15.2
Overseas	2.0	1.6
Other ¹¹	7.9	6.3

Total employment on R&D in businesses for 2004 was 2,660 (based on whole time equivalent figures), which was lower than that in 2003 (2,770) but higher than in 2002 (2,590).

^{9,10,11} For definitions see Notes to Editors, note 5

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SOME HISTORICAL COMPARISONS

Prior to 2001, the Research and Development Survey was conducted every three years (in 1993, 1996 and 1999). Since 2001, DETI has undertaken to survey companies annually. Table 5 below makes comparisons with earlier DETI surveys. To allow comparability of current with previous results, all figures relate to Total Business Expenditure - i.e. civil and defence expenditure by business on R&D (including grants given by government). Higher Education spending and other direct expenditure by Government are excluded.

Key Findings

Between 2003 and 2004 total business expenditure on R&D increased by less than 1% in real terms, with intramural expenditure falling slightly by 3%. Government funding increased by 18% over the year, business expenditure from own funds decreased by 6% and other sources of funding increased by 74% from the low level in 2003.

Table 5: 2004 Business Expenditure on R&D compared with 2003, 2002, 2001, and 1999 (figures in millions).

	Cash Terms					Real Terms (2004 Prices) ¹²					% Change Real Terms	
	2004	2003	2002	2001	1999	2004	2003	2002	2001	1999	03-04	99-04
Total Expenditure	124.3	121.3	156.6	155.0	102.7	124.3	123.9	164.2	167.6	115.3	0.4	7.8
Intramural	115.5	116.5	149.3	149.9	97.2	115.5	119.0	156.5	162.1	109.1	-2.9	5.8
Extramural	8.8	4.8	7.3	5.1	5.5	8.8	4.9	7.7	5.5	6.2	80.5	43.4
Funded by Government	18.9	15.8	11.3	8.6	10.6	18.9	16.1	11.8	9.3	11.9	17.6	59.3
Funded from own funds	95.5	99.9	122.4	137.1	89.4	95.5	102.1	128.3	148.3	100.4	-6.4	-4.8
Other	9.9	5.6	23.0	9.3	2.7	9.9	5.7	24.1	10.0	3.0	73.6	225.4

¹² GDP deflator used to convert cash terms to real terms: 1999 (89.1), 2001 (92.5), 2002 (95.4), 2003 (97.9), 2004=100

The ten biggest R&D spenders in 2004 accounted for 43% of total R&D expenditure, continuing the downward trend from 2001 – 46% in 2003, 60% in 2002, 69% in 2001, 59% in 1999 and 57% in 1996. Six companies have appeared in the top ten in the last four DETI surveys (i.e. 2001, 2002, 2003 and 2004). With three further companies appearing in the top ten three times out of the last four surveys.

In cash terms

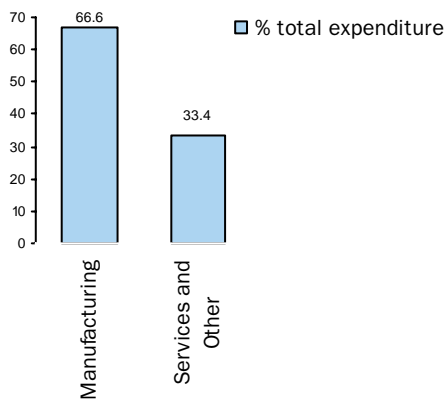
The number of companies spending more than £1m on R&D has increased each year since 1993. In 2004, thirty companies spent more than £1 million on R&D (compared with twenty-six in 2003, twenty-five companies in 2002, nineteen companies in 2001, twenty companies in 1999, sixteen in 1996 and nine in 1993).

Average expenditure was £46,723 per R&D employee in 2004, 6.7% higher than the figure for 2003 (employees are on a whole time equivalent basis).

In 2004, 2660 employees (on a whole time equivalent basis) were engaged in R&D work – 5.2% of all employees of companies involved in R&D. Comparable figures for 2003 were 2,770 employees or 6.3% of all employees of R&D companies (2002: 6.4% and 2001: 5.5%).

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SECTORAL BREAKDOWNS

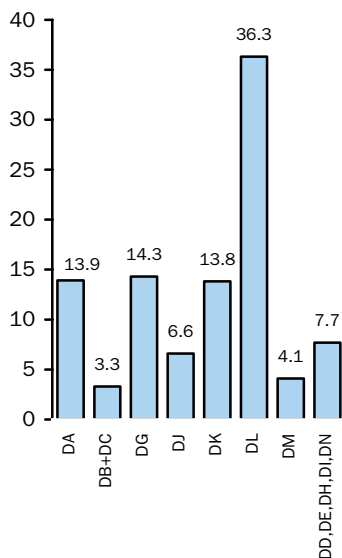
Figure 5: Total R&D Expenditure in 2004



In 2004, the majority of R&D was carried out within the manufacturing sector (67%) with the remaining 33% carried out in services and 'other' industries category. This shows an increase in spend in the services & other sector compared to previous years (in 2003 manufacturing accounted for 71% and services & other 29%). while in 2002 services accounted for just 24% of the total spend.

The Electrical and Optical Equipment division (DL) accounted for (36%) of all manufacturing R&D (see Figure 6) with chemicals division (DG) accounting for 14% and the food products, beverages and tobacco division (DA) a further 14%.

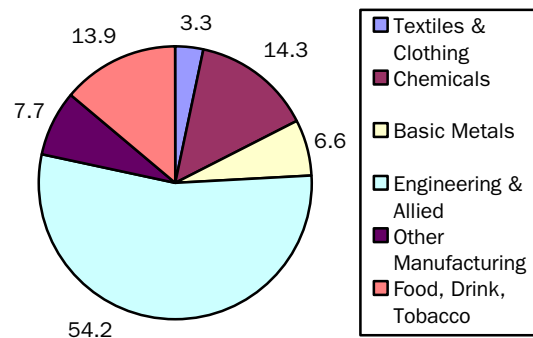
Figure 6: % of Manufacturing R&D Expenditure in 2004 by Division (SIC 2003 basis)¹³



¹³ For a description of subsection headings see Notes to Editors note 6.

Figure 7 below, highlights that just over half 54% of R&D spending within the manufacturing sector was accounted for by companies involved in Engineering & Allied Industries (DK, DL & DM).

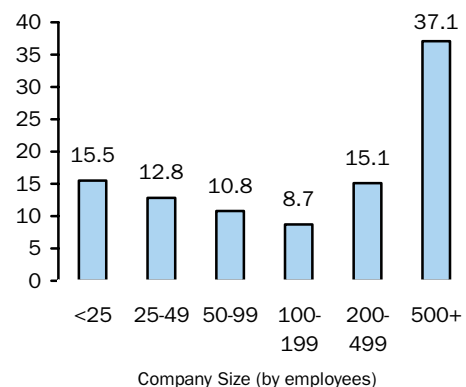
Figure 7: % of Manufacturing Expenditure by SIC 2003 Subsection



Companies with 500 or more employees accounted for over a third (37%) of business R&D expenditure in 2004, although they represented only 7% of R&D performing companies.

Smaller firms (i.e. those with less than 50 employees) represented some 57% of R&D companies and accounted for 28% of total business R&D expenditure while R&D expenditure by medium-sized companies (i.e. those firms with between 50 and 499 employees) accounted for 35% of the total. However the proportion that these large companies make to total R&D expenditure was similar to last year (38%) but lower than in 2002 (50%) and in 2001 (65%).

Figure 8: % of Total R&D Expenditure in 2004 by Company Size



BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – INTRAMURAL EXPENDITURE

Intramural expenditure is perhaps the most important component of total R&D as it shows the amount spent on R&D by firms in NI that was undertaken within Northern Ireland (extramural expenditure by companies in NI may be carried out in other parts of the UK or abroad). Intramural expenditure in Northern Ireland (in cash terms) fell by 0.8% between 2003 and 2004: this is compared to a 1.3% fall in the UK as a whole. Of the 11 other UK regions, six showed a rise in intramural expenditure and five showed a decrease.

As Table 7 shows, intramural expenditure, i.e. spending carried out within the company, accounted for about 93% (£115.5 million) of total expenditure in Northern Ireland in 2004 less than the proportion (96%) in 2003. The majority of both intramural and extramural expenditure was in the manufacturing sector.

The two components of intramural expenditure are current expenditure (salaries & wages and other costs) and capital expenditure (land & buildings and plant & machinery).

Table 6: Intramural Expenditure by UK Government Office Region (Cash Terms)

	Expenditure (£million)		%Change (2003-2004)
	2004	2003	
UK	13,504	13,687	-1.3
England	12,546	12,786	-1.9
North East	269	281	-4.3
North West & Merseyside	1,691	1,559	8.5
Yorkshire & Humber	372	382	-2.6
East Midlands	978	929	5.3
West Midlands	800	587	36.3
Eastern	2,969	3,453	-14.0
London	842	771	9.2
South East	3,265	3,464	-5.7
South West	1,361	1,359	0.1
Wales	228	264	-13.6
Scotland	614	521	17.9
Northern Ireland	115.5	116.5	-0.8

Note: Data for UK and GB regions are from the Office for National Statistics

Table 7: Intramural and Extramural Expenditure by Sector

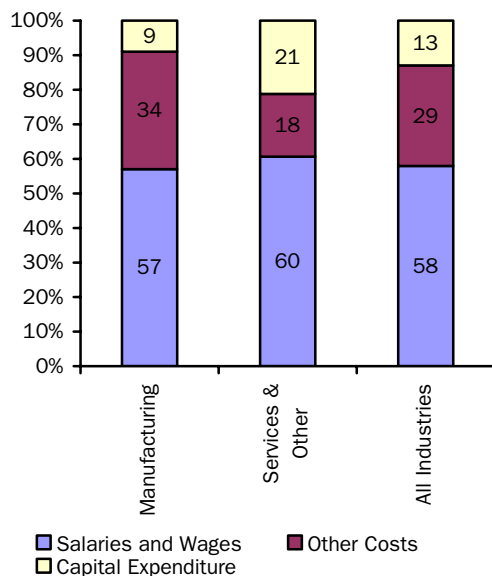
	Intramural		Extramural	
	£m	% of Total Expenditure	£m	£m
Manufacturing	77.5	62.4	5.3	4.3
Services & Other	38.0	30.5	3.5	2.8
All Industries ¹⁴	115.5	92.9	8.8	7.1

¹⁴ All industries include manufacturing, service sector industries plus a range of other industries. For full details of the other industries covered see Notes to Editors note 6.

Table 8: Breakdown of Intramural Expenditure by Sector (£m)

	Manufacturing		Services & Other		All Industries	
	£m	%	£m	%	£m	%
Current Expenditure						
Salaries & Wages	44.0	57	22.9	60	66.9	58
Other Costs	26.4	34	6.9	18	33.3	29
Capital Expenditure						
Land & Buildings	1.7	2	3.5	9	5.2	5
Plant & Machinery	5.4	7	4.6	12	10.1	9
Intramural Expenditure	77.5	100	38.0	100	115.5	100

Figure 9: Intramural Expenditure by Sector



Current expenditure makes up 87% of intramural expenditure, compared with 91% in 2003. Table 7 and Figure 9 highlight that there were differences between sectors in the categories of intramural R&D spend.

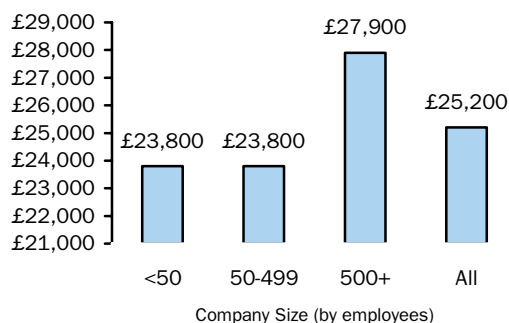
While the proportion spent on salaries and wages were similar in both Manufacturing (57%) and Services & Others (60%), the proportion on capital expenditure in Manufacturing (34%) was nearly twice that in Services and Other (18%). Conversely other costs were lower in Manufacturing (9%) than in Services & Other (21%). Salaries and Wages as a proportion of Intramural Expenditure has increased in Manufacturing from the proportion in 2003 (55%) but decreased in Services and Other (67%).

The proportion on capital expenditure in Services and Other increased considerably from 5% to 21% while there was less change in Manufacturing (down slightly from 11% to 9%).

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – CURRENT EXPENDITURE

As Figure 10 below shows, there is a distinct difference in the level of salaries & wages per head between companies of different size (based on whole time equivalent figures).

Figure 10: Salaries & Wages per Head by Company Size (rounded to nearest 100)



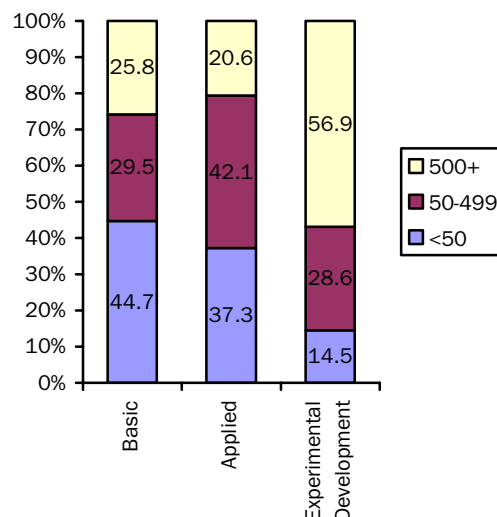
Overall the salaries and wages per R&D FTE was £25,200 up by approximately 3% from £24,500 in the previous year. Salaries and wages per head for large companies (500+ employees) are £27,900 per head, while for small and medium sized companies the figure is considerably lower at £23,800 for both.

Larger companies employed a higher percentage of scientists (79%) than medium and small (both 67%). It is likely that scientists earn more than other workers involved in R&D, which would account for the differences in average wages between R&D employees in small and medium companies than large companies.

Table 9: Type of Research by Sector as % of All Research

	Manufacturing	Services and Other	All Industries
Basic	3.8	2.4	6.1
Applied	22.8	15.7	38.5
Experimental Development	43.7	11.7	55.4
All Research	70.2	29.8	100.0

Figure 11: Type of Research by Company Size (by employees)



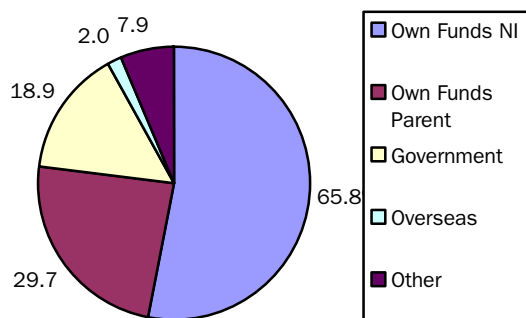
Current expenditure can also be analysed in terms of type of research carried out. Experimental development accounts for 55.4% of current expenditure with applied research and basic research accounting for 38.5% and 6.1% respectively.

Figure 11 shows that a significant part of spending on basic research is carried out by small-sized companies (i.e. those firms with less than 50 employees) (44.7%), the majority of spending on applied is carried out by medium sized companies (50-499 employees) (42.1%) and that large companies (500+ employees) are dominant in terms of spend on experimental development (56.9%). A detailed breakdown of the type of research carried out by both industry and company size is given in Annex 1.

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – SOURCES OF FUNDS

The funding of R&D (intramural and extramural) comes from a number of sources: the companies' own funds, from Government, overseas funding (e.g. EU) and other businesses.

Figure 12: Sources of R&D Funding (£m)



The majority of funding (77%) came from the companies' own funds, with 15% from government, 2% from overseas and 6% from other sources. The proportion of funding from own funds fell from 82% in 2003 but similar to that in 2002 (78%). Funding from overseas was similar to that in 2003 while funding from government increased from 13% in 2003 to 15% in 2004.

Table 10: Percentage of R&D Funding by Source split by Company Size

	<50	50-499	500+	All
Own Funds NI	42.2	70.1	45.1	52.9
Own Funds Parent	18.5	17.2	34.2	23.9
Government	20.0	6.8	19.4	15.2
Overseas	4.2	0.0	1.2	1.6
Other	15.1	5.9	0.1	6.3
Total	100.0	100.0	100.0	100.0

Table 10 shows that the greatest proportion of R&D funding was from Own Funds NI, however considerably larger for 50-499 (70%) compared to <50 (42%) and 500+ (45%).

The proportion of funding supplied by parent companies was much higher for large firms. These large businesses have reported that 34% of funding came from parent companies, while medium-sized businesses stated that 17% of funding came from parent companies and small businesses sourced 19% of R&D spend from parent companies.

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – OWNERSHIP ANALYSIS

Analysis by company ownership to establish levels of R&D expenditure by local or foreign-owned firms was first published in the 2002 Northern Ireland Business R&D Survey.

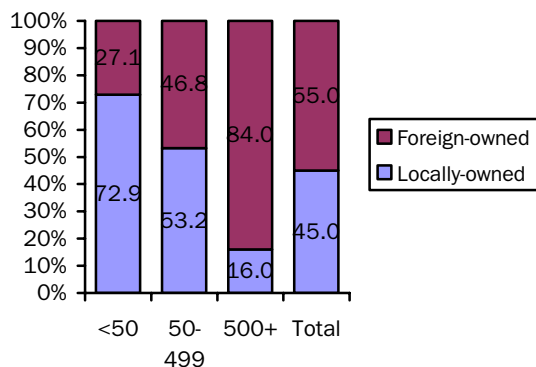
Table 11: Breakdown of R&D expenditure by ownership of company

	£m	%	Number of companies	%
Locally-owned companies	55.9	45.0	239	76.6
Foreign-owned companies	68.4	55.0	73	23.4
Total (All companies)	124.3	100.0	312	100.0

Expenditure by locally owned companies (£55.9m) was similar to that in 2003 (£56.5m), but the number of these companies who reported R&D expenditure increased from 220 to 239.

Table 11 shows that of the £124.3 million total R&D spend in 2004, just over half was by foreign owned companies (i.e. not NI-owned companies) although they accounted for approximately only one-quarter of all R&D-performing companies. While over three-quarters of all R&D-performing companies (76.6%) were Northern Ireland owned, they accounted for under a half of total R&D spend.

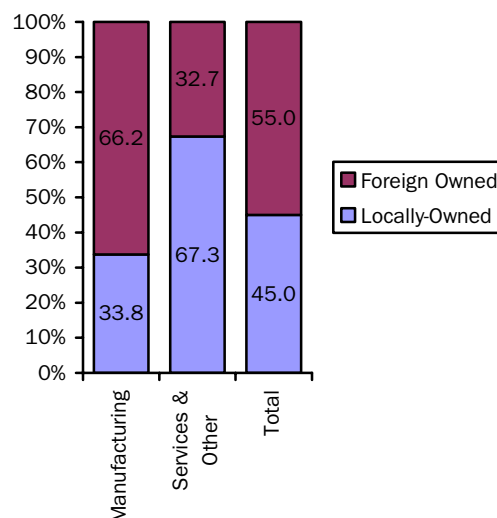
Figure 13: Expenditure by ownership by company size



The proportion of overall expenditure by locally owned companies was 45.0%, down slightly from last year 46.6%. The majority of R&D spend in small companies (72.9%) and medium-sized companies (53.2%) was by Northern Ireland owned firms.

However, the analysis shows that, in large companies (500+ employees) the vast majority of R&D expenditure (84.0%) was by foreign-owned firms.

Figure 14: Expenditure by ownership by sector



Analysis of R&D spend split by ownership and sector shows that 66.2% of R&D spend in the manufacturing sector was by externally-owned companies.

However, the situation was reversed in the Services and Other sector, where Northern Ireland owned companies accounted for 67.3% of R&D expenditure.

Compared to the previous year foreign-owned companies increased their proportion of expenditure in Manufacturing (from 58.2% to 66.2%) but decreased their proportion of expenditure in Services and Other (from 41.5% to 32.7%).

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – EMPLOYMENT ON R&D

In 2004, companies surveyed reported a total of 2,880 employees working on R&D, approximately 5.6% of all employees in companies carrying out R&D less than in 2003 (6.7%). [The whole time equivalent figure¹⁵ for the same period was 2,660 or 5.2%].

Figure 15: Total R&D Employment - Full-time Part-time and Whole Time Equivalent

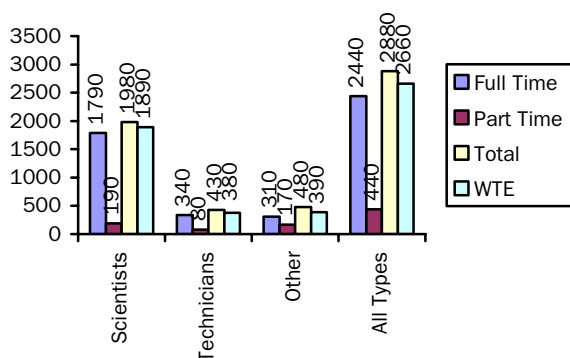
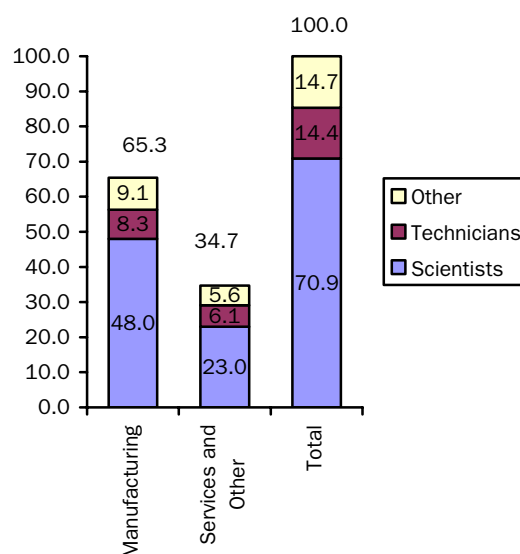


Table 12: Number of R&D Employees by Type

	Full time	Part time	Total
Scientists	1,790	190	1,980
Technicians	340	80	430
Other	310	170	480
All Types	2,440	440	2,880

Approximately 85% of all R&D employees were full-time. By type of R&D employee, scientists accounted for 69%, technicians for 15% and other employees (e.g. professional, administrative, clerical and industrial) for 16% of all R&D employees. Comparable whole time equivalent figures show that 1,890 employees were scientists (71%), 380 employees were technicians (14%) and the number of other employees was 390 (15%).

Figure 16: % of R&D Employment (whole time equivalent) by Sector



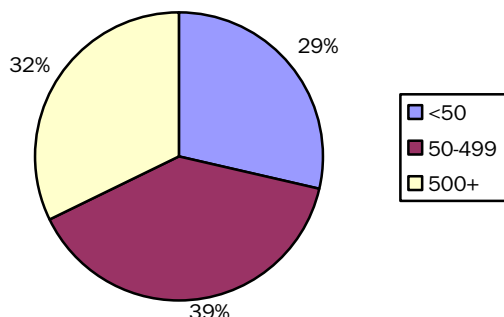
On a whole time equivalent basis there were 1,740 employees in manufacturing and 920 in the Services & Other sectors. Within manufacturing, scientists accounted for 73% of R&D employees with the level of technicians at 13% and other employees at 14%.

Within the Services & Other sectors, scientists made up 66% of R&D employees, technicians 18% and other employees 16%.

¹⁵ For an explanation of how Whole Time Equivalent employment is calculated see Notes to Editors note 5

BUSINESS EXPENDITURE ON RESEARCH & DEVELOPMENT – EMPLOYMENT ON R&D

Figure 17: R&D Employment by Company Size

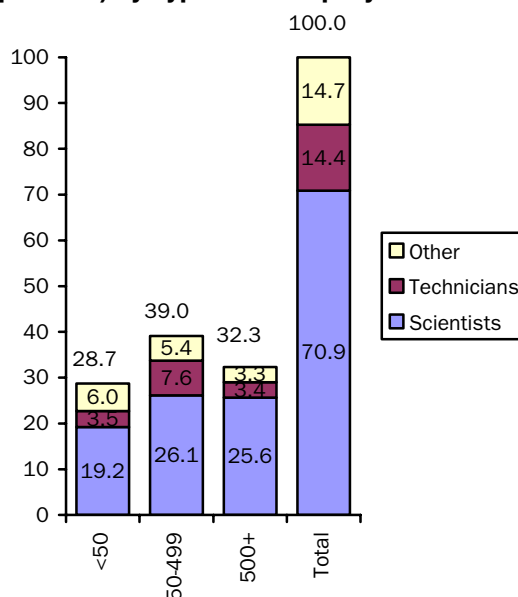


Using whole time equivalent employment figures, Figure 17 shows how total R&D employment is split across companies of different sizes. The greater proportion of R&D employees are in the medium sized companies (39%), followed by large companies (32%) and small companies (29%). These proportions are similar to 2003 (39%, 33% and 28% respectively).

There is a difference in the type of employee to be found in companies of different sizes. Approximately four fifths (79.2%) of R&D employees in large firms are scientists, compared with 67.0% in small firms and 66.9% in medium-sized firms. Large companies employ fewer persons in the 'other' category (10.2%) than either small or medium-sized companies (20.9% and 13.8% respectively).

Figure 18 also shows the spread of R&D employees across different size bands, with 29% of all R&D employees working in firms with less than 50 employees, 39% in medium-sized firms and around 32% of all R&D workers employed by large companies.

Figure 18: % of R&D Employment (whole time equivalent) by Type and Company Size



For the first time in 2004 businesses were asked if they received any R&D tax credits and if their R&D work was part of a joint project.

43 R&D performing companies reported that they received tax credits. 38 of these companies specified the amount they received, which amounted to £6.0 million in total, with the remaining 5 companies unable to quantify the amount when asked.

37 companies reported that their R&D work was part of joint project with a source outside their company. This external source was split nearly evenly between other businesses (19 companies) and higher educational establishments (17 companies), with one company reporting that their joint project was with both another business and a higher educational establishment.

R&D Information from other sources

4

Northern Ireland Annual Business Inquiry (NIABI)

Information on the extent to which research and development is carried out by companies in Northern Ireland is available from the Northern Ireland Annual Business Inquiry (NIABI) carried out annually by DETI.

The latest 2003 NIABI reported that out of about 3,300 companies in the survey, 7% (231) had someone in the business engaged in research and development work during the year. The Manufacturing sector was the sector with the highest proportion of companies who carried out R&D work (17%), while the proportion for the Service industries was 3%.

Figure 19 shows, the percentage of companies who carried out R&D work in 2003, for those sectors and sub-sectors of the manufacturing industries where there were more than ten companies who did so. These were concentrated in the Manufacturing sector, where over two fifths (42%) of companies in the manufacture of chemicals, chemical products and man-made fibres did so. The only other sector included was Real Estate, Renting and Business activities (K), which includes companies in the Computer and related activities (SIC 72) and Research and Development (SIC 73) industries.

Figure 19: Percentage of companies who carried out R&D work by industry



DA Manufacture of Food Products, Beverages and Tobacco
DB Manufacture of Textiles and Textile Products
DG Manufacture of Chemicals, Chemical Products and Man-made Fibres
DH Manufacture of Rubber and Plastic Products
DJ Manufacture of Basic Metals and Fabricated Metal Products
DK Manufacture of Machinery and Equipment
DL Manufacture of Electrical and Optical Equipment
K Real Estate, Renting and Business activities.

Business Expenditure on Research & Development in the Republic of Ireland

5

The Business Sector Research and Development Survey has been conducted biennially by Forfas and its predecessors for over two decades. The latest survey was published in May 2005 and refers to the year 2003.

R&D activity in aggregate terms in the business sector continued to grow between 2001 and 2003. Total spend amounted to €1,076m in 2003, up from €901m in 2001. The average annual growth rate in the two year period was 9.2% (in nominal terms), compared to a rate of 7.0% in the 1999-2001 period. In real terms, allowing for inflation, the average annual growth rate was 5.2% for 2001-2003. These growth rates reflect a re-acceleration in the rate of growth of R&D activity, following a slow down in the period 1999-2001. Despite the 9.2% growth in BERD the number of companies performing R&D in RoI fell by an annual 5.5% between 2001 and 2003.

A small number of sectors dominated business R&D activity, Software and Computer sector (35%), Electrical and Electronics sector (20%), Pharmaceuticals (18%) and Instruments (11%). An important trend over the past decade has been the systematic and substantial increase in R&D expenditure in Software and Computer related services (up from 15% in 1993 to 35% in 2003) contrasting with the decline in the share accounted for by the Food, Drink and Tobacco sector (down from 12% in 1993 to 4% in 2003.)

Foreign owned enterprises accounted for 72% of activity in 2003, rising from 65% in 2001, with foreign owned companies accounting for 95% of R&D expenditure in the Pharmaceutical sector.

The total number of R&D personnel (FTE) showed a slight rise of 2% from 2001 to 2003, from 9,126 in 2001 to 9,281 in 2003. Of these, just over six thousand (6,012) were researchers.

Business Expenditure on Research & Development – Notes to Editors

6

1. The survey of Northern Ireland Civil and Defence Expenditure on Research and Development during 2004 was undertaken by Statistics Research Branch of the Department of Enterprise, Trade and Investment (DETI). The sample and survey results only cover ‘business enterprises’ as defined in the ‘Frascati’ manual. This excludes government organisations, higher education establishments and charities.

R&D surveys pose special problems for survey design – R&D takes place in only a small proportion of businesses but a comprehensive list of these businesses does not exist. A simple random sample of the business population would not be suitable for an R&D survey because many of the sample businesses would not undertake R&D and many significant R&D performers would be missed in such a sample.

The solution is to implement a stratified sample design. The stratification variable was the known level of R&D performance of the businesses. This information was gained from previous surveys (mainly the 2003 survey carried out by DETI) and extra information from various sources such as ONS, Invest NI and a filter question on the Annual Business Inquiry. For the purposes of the 2004 survey, businesses were stratified into 4 groups:

- (i) Businesses responding to the 2003 DETI survey who returned or had estimated a total R&D expenditure value greater than zero;
- (ii) Businesses reporting positively to the R&D filter question in the Annual Business Inquiry; other identified potential R&D performers (principally, those companies who had received assistance from Invest NI during 2003 or 2004); and companies newly identified to ONS as R&D spenders;
- (iii) Companies who have been identified as ‘not R&D performers’ when selected for past surveys;

- (iv) The remainder of Northern Ireland businesses.

The businesses making up strata (i) and (ii) formed a register of R&D performers and the sample for the 2004 survey was derived from this register. Indeed, each of these businesses was issued a questionnaire – in effect, therefore, a ‘census’ of R&D performers was carried out. Strata (iii) and (iv) were not included as they were assumed to have zero R&D expenditure.

For 2004, 565 forms were sent out to businesses believed to be performing R&D. Completed forms were returned by 526 businesses representing a response rate of 93 per cent. Estimates were made for the R&D activity of non-responding businesses.

2. This is the seventh business R&D survey carried out by DETI - it was carried out triennially between 1993 and 1999, but is now collected on an annual basis (from 2001 onwards). Prior to 2001, the Office for National Statistics (ONS) published regional intramural R&D estimates – including figures for Northern Ireland - from an annual UK-wide survey. The ONS Survey, as it related to Northern Ireland, was based on a relatively small sample of companies and was not detailed enough for DETI requirements. DETI therefore conducted its own benchmark survey every three years. In those years when both a UK-wide and a separate DETI survey were conducted, two estimates of intramural business R&D expenditure for Northern Ireland were therefore available. However, from 2001 onwards data from the DETI survey is passed to ONS colleagues and intramural R&D figures for Northern Ireland from both sources therefore are equal.

3. The definition of R&D adopted for the purposes of the NI inquiry is the same as that used by ONS for the equivalent GB survey:

"The guiding line to distinguish between research and technological development activity (R&TD) from non-research activity is the presence or absence of an appreciable element of novelty or innovation. If the activity departs from routine and breaks new ground it should be included; if it follows an established pattern it should be excluded".

The NI questionnaire follows the same structure and includes the same questions as the GB questionnaire, although there were some modifications to tailor the questions asked for use in NI. [The sources of funding question for the NI survey, for example, specifically identified Invest NI as one of the government sources.]

Two new questions were included in the NI questionnaire for 2004, asking firstly whether companies received any tax credits and if so, whether with another business or higher education establishment.

4. The survey covers expenditure in the year ending December 2004, although companies were given the option of supplying data for the business year ending on any date between 6 April 2004 to 5 April 2005.

It is worth noting that a number of NI companies are part of national and international companies. Many concentrate their R&D at particular sites, not necessarily in NI, although all of their plants, including those in NI, will share in the benefits of research. Variations may occur in NI R&D data from year to year due to the influence of one or two large-scale projects.

5. Definition of Terms

a) Type of R&D Expenditure

Total Expenditure on R&D - This covers civil expenditure by businesses, defence expenditure by businesses and other expenditure by Government. Due to disclosure rules, it is not possible to obtain a split between civil and defence R&D expenditure, for the 2004 survey.

Other Expenditure by Government - The ONS also collect annual data on Government-funded Science, Engineering and Technology for the UK as a whole and publish this in the 'Forward Look' document. By utilising Forward Look data in conjunction with the results from the DETI survey, it has been possible to compile a more complete picture of total expenditure on R&D in NI. Forward Look figures will include financial assistance to both higher education and to businesses by

Government as well as expenditure on R&D conducted within Government Departments. The figures shown in Table 2, expenditure by businesses and higher education and other expenditure by Government, should compliment each other; i.e. there should be no double counting.

Intramural R&D - This is R&D carried out within the company.

Extramural R&D - This is R&D funded by plant(s) in Northern Ireland but undertaken by other firms or organisations in the UK and abroad.

Capital Expenditure - Includes companies' expenditure on land, buildings, plant and machinery (including vehicles). Capital expenditure on R&D is particularly subject to distortions and is likely to fluctuate significantly from year to year as a small number of projects could cause this percentage to increase or decrease sharply. For example, some R&D projects may have a duration of several years but involve heavy capital outlay in the formative years of the research. The erratic nature of R&D capital expenditure may partly explain differences in capital expenditure among companies of different sizes. Only by looking at underlying trends over several years will it be possible to see if some sectors or companies of differing sizes are more likely to require more expenditure of a capital nature.

b) Type of Research

Basic Research - work undertaken primarily for the advancement of scientific knowledge without a specific practical application in view.

Applied Research - Research undertaken with a general or a particular application in view.

Experimental Development - covers 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. This includes the prototype or pilot plant stage, design and drawing required during R&TD and innovation work done on contracts with outside organisations, Government departments and public bodies.

c) Sources of Funding

Business - Funds from individual plants within NI or from parent or other companies within the group.

Government - Funds from Invest NI (including IFI) and other government sources.

Overseas - This includes EU Funds as well as other funds from outside the UK. EU funds are those from the European Commission's Structural or Framework Funds.

Other Funds - Funds from private individuals, private non-profit making bodies, higher education establishments and any other sources.

d) Employment on R&D

Staff Types - Average employment on R&D splits into the following categories; scientists and engineers, technicians, laboratory assistants and draughtsmen etc., and other (including Professional, Administrative, Clerical and Industrial Employees).

Whole Time Equivalent Employment - This is calculated by dividing the number of part-time employees by 2 and adding to the number of full-time employees.

6. Results are shown mainly by industrial sector and company size (based on the number of employees). The sectoral analyses are based on the Standard Industrial Classification (or SIC 2003 classification) of industries.

Manufacturing is defined to cover Section D, which includes the following subsections:

DA	Food products, Beverages & Tobacco
DB	Textiles & Textile Products
DC	Leather & Leather Products
DD	Wood & Wood Products
DE	Pulp, Paper & Paper Products; Publishing and Printing
DG	Chemicals, Chemical Products & Man-Made Fibres
DH	Rubber & Plastic Products
DI	Other Non-metallic Mineral Products
DJ	Basic Metals & Fabricated Metal Products
DK	Machinery & Equipment Not Elsewhere Classified
DL	Electrical & Optical Equipment
DM	Transport Equipment
DN	Other Manufacturing Not Elsewhere Classified

Where aggregation of subsections within manufacturing is required this would normally be as follows (for example, see Figure 7):

DA	Food, Drink & Tobacco
DB+DC	Textiles, Leather, Footwear & Clothing
DG	Chemicals & Chemical Products
DJ	Basic Metals & Fabricated Metal Products
DK, DL	Engineering & Allied Industries + DM
DD, DE,	Other Manufacturing
DH, DI, DN	

The Service Sector covers Sections G through to O, namely:

G	Wholesale & Retail Trades
H	Hotels & Restaurants
I	Transport, Storage & Communication
J	Financial Intermediation
K	Real Estate, Renting & Business Activities
L	Public Administration and Defence
M	Education
N	Health & Social Work
O	Other Community, Social & Personal Service Activities

The Other Industries category covers:

A	Agriculture, Hunting and Forestry
B	Fishing
C	Mining & Quarrying
E	Electricity, Gas & Water
F	Construction

7. Figures contained within all tables in this Bulletin may not add due to rounding. Percentages calculated on these rounded figures may differ from those that are detailed in the text.

8. The annual NIABI conducted by the Department of Enterprise Trade and Investment (DETI) provides estimates for the year of the value of mainly business based economic activity across some two thirds of the Northern Ireland economy. The survey covers most of the Production, Construction, Distribution and Service industries but excludes central government public sector activities for the most part. In particular, since 2002 it has contained a question on whether there is anyone in the business engaged in research and development work on a regular basis during the year.

Northern Ireland Higher Education Expenditure on Research & Development during 2004

7

Table 13 details the headline results from the 2002, 2003 and 2004 Higher Education Expenditure on Research & Development (HERD) surveys.

Table 13 Higher Education Expenditure on R&D

	£million	£million	£million
	2004	2003	2002
HERD Expenditure ¹⁶	136.9	129.1	107.4
of which:			
Current Expenditure	115.0	108.4	99.5
Capital Expenditure	21.9	20.7	7.9
<u>Source of funding of R&D:</u>			
Government Block Grant	70.2	72.4	70.7
OST Research Councils ¹⁷	6.8	6.7	6.4
UK-based charities	5.9	6.6	7.0
UK Cent Gov/Local Auth/Health ¹⁸	33.3	24.5	11.8
UK Ind/Comm/Pub Corp ¹⁹	3.0	3.2	3.7
EU Government	6.2	3.8	3.5
EU Other	1.9	1.0	0.7
Other Overseas	1.1	1.5	0.9
Other Sources	8.6	9.3	2.7
	Number	Number	Number
HERD Employment ²⁰	1,850	1,850	1,730
of which:			
Academic staff	810	790	730
TLAD's ²¹	700	640	610
Other ²²	340	410	390

¹⁶ Expenditure for 2004 includes £0.9 million of expenditure funded by Northern Ireland businesses (£1.2m in 2003 and £1.6m in 2002.). Therefore, net HERD in 2004 was £136.1m (this is as detailed in Table 2). All university expenditure on R&D is intramural expenditure - i.e. R&D work carried out within the university. Figures given are in £millions and constituent parts may not add due to rounding.

¹⁷ Office of Science and Technology Research Councils

¹⁸ Funding from UK Central Government, Local Authorities and Health Trusts/Hospitals

¹⁹ Funding from UK industry/commerce/public corporations

²⁰ This is the number of full-time equivalents. Figures are rounded to the nearest 10 and constituent parts may not add due to rounding

²¹ Technicians, Laboratory Assistants and Draughtsmen etc.

²² Includes Administrative, Clerical and Industrial Employees.

Total HERD expenditure increased by 6% from £129.1m in 2003 to £136.9m in 2004, compared with an increase of 20% from 2002 to 2003. This increase was evenly spread between capital and current expenditure, with a 6% increase in both areas. This contrasts with the previous period where capital expenditure in 2003 was more than two and a half times the level in 2002.

Employment totals remained constant between 2003 and 2004 at 1,850 full-time equivalent persons in 2003, with the numbers of both academic and TLAD staff increasing and the numbers of other staff decreasing.

Block grants remained the largest source of funds but their contribution decreased, to 51% of all funding in 2004, from 56% in 2003 and 66% in 2002. Funding from UK Central Government/Local Authorities and Health Trusts/Hospitals increased by 36% from £24.5m in 2003 to £33.3m in 2004, accounting for 24% of HERD funding in 2004 compared to 19% in 2003 and 11% in 2002. EU Government funding increased by 61% between 2003 and 2004, from £3.8m to £6.2m. .

See Notes to Editors overleaf.

Higher Education Expenditure on Research & Development – Notes to Editors

8

Table 13 details Higher Education Expenditure on R&D (HERD). The table gives combined results from the two main Northern Ireland universities - i.e. Queens University Belfast (QUB) and the University of Ulster (UU). The data collected refers to the academic year 2003/2004 ending 31/7/04. The universities have made data available for this period on the basis of Transparency Review data collected within each respective institution.

Transparency Review

The Transparency Review is a Government initiative, introduced with the Comprehensive Spending Review (CSR) in 1998. The CSR awarded £1.5bn of additional funding for Higher Education, but the Treasury made this conditional on the sector becoming more open about the way public funds are spent in universities and colleges.

A Steering Group was set up to implement the policy and their advice was referred to Government in the Transparency Review Report. This was endorsed in June 1999 and is now required policy for the sector. All institutions had to report transparently on the costs of their Teaching, Research, and other activities for 1999/2000 in July 2001 and each year thereafter. As a consequence, accurate and comparable R&D data for each university can now be obtained and this is presented in Table 13.

More detailed information on Transparency Review procedures in each of the local universities can be found at <http://www.qub.ac.uk/costing/> for QUB and at <http://www.ulst.ac.uk/finance/time/> for UU.

Total R&D Expenditure - Following consultation with the universities, it was agreed that all university expenditure on R&D is 'intramural' expenditure - i.e. R&D work carried out within the university.

Current Expenditure – Includes expenditure on salaries and wages and other costs (fuel, rent etc.).

Capital Expenditure - Includes expenditure on land, buildings, machinery and equipment. It should be noted that capital expenditure on R&D within universities is likely to fluctuate significantly from year to year. For example, an R&D project may have a duration of several years but involve heavy capital outlay in the formative years of the research.

Source of funding – this is split into nine separate categories as shown in table 13. For the purposes of this survey, the Government Block Grant was used as a 'balancing figure' with values for the other eight categories completed using data from the Transparency Review.

Employment on R&D – it is possible, using the results from the Transparency Review, to determine how much time members of staff spend on R&D. This has been converted to numbers of full-time equivalents in each of the three categories shown. Figures shown have been rounded to the nearest 10.

Annexes

9

ANNEX 1

Breakdown of Intramural Expenditure (Civil & Defence) 2004 £000's (rounded to nearest £100,000)

	Current Expenditure						Capital Expenditure			Total Intramural Expenditure
	Salaries & Wages	Other Costs	Current Expenditure	Basic Research	Applied Research	Experimental Development	Lands & Building	Plant & Machinery	Capital Expenditure	
Manufacturing										
<50	4,800	2,100	6,800	500	3,900	2,500	100	600	700	7,500
50-499	15,600	7,400	22,900	1,700	11,200	9,900	400	2,200	2,600	25,500
500+	23,700	16,900	40,600	1,600	7,800	31,300	1,300	2,600	3,900	44,600
Total	44,000	26,400	70,400	3,800	22,900	43,700	1,700	5,400	7,100	77,500
Services										
<50	13,400	4,900	18,300	2,300	10,500	5,600	3,400	3,800	7,200	25,500
50+	9,200	1,900	11,100	0	5,100	6,000	100	600	700	11,800
Total	22,600	6,800	29,400	2,300	15,500	11,600	3,500	4,400	7,900	37,300
All Industries										
<50	18,200	7,000	25,200	2,800	14,400	8,100	3,500	4,700	8,100	33,300
50-499	24,700	9,200	33,900	1,800	16,200	15,900	400	2,700	3,200	37,100
500+	24,000	17,100	41,100	1,600	7,900	31,600	1,300	2,700	4,000	45,100
Total	66,900	33,300	100,200	6,200	38,600	55,500	5,200	10,100	15,300	115,500

ANNEX 2

Breakdown of Extramural Expenditure (Civil & Defence) 2004 £000's (rounded to nearest £100,000)

	Extramural Expenditure			
	Expenditure within NI	Expenditure within GB	Expenditure outside UK	Total Extramural Expenditure
Manufacturing				
<50	500	200	0	700
50-499	1,200	900	1,400	3,500
500+	200	600	300	1,100
Total	1,800	1,700	1,700	5,300
Services				
<50	600	100	300	1,000
50+	900	400	1,100	2,400
Total	1,500	500	1,400	3,400
All Industries				
<50	1,100	300	300	1,800
50-499	2,000	1,300	2,600	6,000
500+	200	600	300	1,100
Total	3,400	2,300	3,200	8,800

ANNEX 3

Breakdown of the Sources of R&D Funding 2004 £000's (rounded to nearest £100,000)

	Own Funds		Government		Overseas			Other		Total
	NI	Parent	INI	Other	EU Structural	EU Framework	Other funds outside UK	Private Industry	Other funds inside UK	
Manufacturing										
<50	5,500	1,500	1,100	0	0	0	0	0	100	8,200
50-499	24,000	2,900	2,000	0	0	0	0	0	0	29,000
500+	20,500	15,700	2,900	5,900	0	300	200	0	0	45,600
Total	50,000	20,100	6,000	6,000	0	300	200	100	100	82,800
Services										
<50	9,300	5,000	4,000	1,800	0	0	1,400	4,600	400	26,500
50+	6,100	4,600	1,000	0	0	0	0	2,500	0	14,200
Total	15,300	9,600	5,000	1,800	0	0	1,400	7,100	400	40,800
All Industries										
<50	14,800	6,500	5,200	1,800	100	0	1,400	4,700	600	35,100
50-499	30,200	7,400	2,900	0	0	0	0	2,500	0	43,100
500+	20,800	15,800	3,000	6,000	0	300	200	0	0	46,200
Total	65,800	29,700	11,100	7,800	100	300	1,600	7,200	700	124,300

ANNEX 4

Breakdown of Employment on R&D 2004 (rounded to nearest 10)

	Scientists				Technicians				Other				All Types			
	Full-time	Part-time	Total	WTE	Full-time	Part-time	Total	WTE	Full-time	Part-time	Total	WTE	Full-time	Part-time	Total	WTE
Manufacturing																
<50	160	50	200	180	30	10	40	30	20	60	80	50	210	110	320	270
50+	1,050	90	1,140	1,100	170	40	210	190	150	70	230	190	1,380	190	1,570	1,470
Total	1,210	130	1,340	1,280	200	50	250	220	180	130	310	240	1,590	310	1,890	1,740
Services																
<50	310	40	350	330	50	10	60	60	90	30	120	110	460	80	540	500
50+	270	10	280	280	90	20	110	100	30	10	40	40	390	40	430	410
Total	580	50	630	610	140	30	170	160	130	40	160	150	850	120	970	910
All Industries																
<50	470	90	560	510	80	20	100	90	120	90	200	160	670	200	860	760
50-499	650	80	740	690	180	50	230	200	110	60	170	140	940	190	1,130	1,040
500+	670	20	690	680	80	10	100	90	80	20	100	90	830	50	890	860
Total	1,790	190	1,980	1,890	340	80	430	380	310	170	480	390	2,440	440	2,880	2,660