

20 November 2014

**Coverage**

Northern Ireland, unless otherwise stated

**Theme**

The Economy

**Table 1: Total Expenditure on R&D in cash terms (£million)**

	2011	2012	2013
<b>Total expenditure on R&amp;D (of which)</b>	567.5	624.1	645.1
<b>Expenditure by Businesses</b>	388.8	461.3	481.8
<b>Expenditure by Higher Education<sup>1</sup></b>	164.3	147.3	147.0
<b>Other expenditure by Government</b>	14.4	15.5	16.3

<sup>1</sup>To avoid double counting, this figure excludes £1.3m in 2013, £1.6m in 2012, £1.3m in 2011 of expenditure on R&D by businesses that was undertaken by universities or higher education establishments.

**Issued by:**

Economic and Labour Market Statistics Branch,  
Tel: 028 9052 9431  
Email: [statistics@dfpni.gov.uk](mailto:statistics@dfpni.gov.uk)

Enquiries by the media should be directed to:  
Press Office, DETI,  
Tel: 028 9052 9604  
Email: [pressoffice@detini.gov.uk](mailto:pressoffice@detini.gov.uk)  
[www.statistics.detini.gov.uk](http://www.statistics.detini.gov.uk)

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**(Detailed analysis of 2013 results)**



## NORTHERN IRELAND RESEARCH AND DEVELOPMENT (R&D) 2013 HEADLINE RESULTS

- Total expenditure on R&D in Northern Ireland in cash terms was £645.1 million in 2013, of which £481.8m (75%) was spent by Businesses, £147.0m (23%) by the Higher Education sector and the remainder (£16.3m or 3%) was Government expenditure. There was an increase of £21.0m (3%) in cash terms in Northern Ireland total R&D expenditure between 2012 and 2013, driven by the Business sector.
- Total business R&D expenditure in 2013 was £481.8m, up £20.5m (4%) in cash terms on the previous year. Between 2008 and 2013, overall Business R&D expenditure has risen by 162% in cash terms (from £183.9m).
- The percentage increase in Northern Ireland (in-house) business R&D expenditure (5.5%) between 2012 and 2013 was the ninth highest of the 12 UK regions. Of the 12 UK regions, eleven showed an increase in cash terms over the period.
- Government R&D expenditure rose in cash terms by £0.8m (5%) while Higher Education expenditure decreased by £0.3m (-0.2%) over the year.
- The ten biggest spending companies accounted for 60% of the total R&D spend in Northern Ireland in 2013, lower than in 2012 (63%).
- Externally owned companies accounted for 75% of Business R&D expenditure compared to 25% by locally owned companies. R&D spend by locally owned companies reported an annual increase of 16%.
- Expenditure by Small and Medium Enterprises (SME) businesses with less than 250 employees increased by £1m (0.6%) from 2012 to 2013, in cash terms. Since 2008 such expenditure has increased by 64% to £173.8m.

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### Introduction

This release provides information on the level of R&D activity in Northern Ireland. R&D activity is defined as research or technological development with an appreciable element of novelty or innovation in line with international criteria (the Frascati manual). 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 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.

### Total Expenditure on R&D in Real Terms

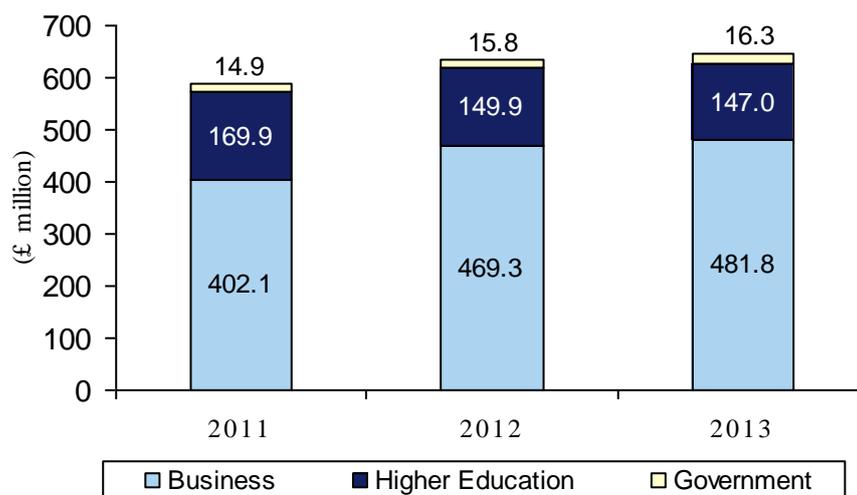
In addition to the measure of R&D activity in cash terms provided earlier (page 1) it is also of interest to examine change in spend in real terms. This takes out the effect of price changes over time through the use of deflators, enabling a more consistent measure of investment in R&D activity.

In real terms, total expenditure increased by £10.2m or 2% from £634.9m in 2012 to £645.1m in 2013.

In 2013 the Northern Ireland Business sector again accounted for a much greater share of total R&D expenditure (75%) than the Higher Education sector (23%). In 2012 the figures were 74% and 24% respectively.

Over the last five years (2008-2013) total R&D spending in real terms in NI has risen by 69%.

**Figure 1: Main Split of R&D Expenditure in Real Terms (£million)**



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From 2012 to 2013 there was an increase in expenditure by Businesses and Government and a decrease in Higher Education expenditure. In real terms, expenditure by Businesses increased by £12.5m (3%) over the year and Government expenditure increased by £0.5m (3%) over the year. Expenditure by Higher Education decreased by £2.9m (-2%) in real terms over the year.

Business R&D expenditure rose by 136% between 2008 and 2013 in real terms.

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

### **Business R&D: by Company Size**

Companies with 250 or more employees accounted for 64% of business R&D expenditure in 2013, although they represented only 7% of R&D performing companies. Small firms (i.e. those with less than 50 employees) represented some 71% of R&D performing companies and accounted for 13% of total business R&D expenditure while R&D expenditure by Small and Medium-sized companies (SMEs)\* accounted for 36% of the total business expenditure. Total SME expenditure increased in cash terms by £1m (0.6%) from 2012 to 2013. However, since 2008 SME expenditure has increased by 64% to £173.8m. The proportion that large companies (250+ employees) make to total R&D business expenditure (64%) was slightly higher than the previous year (2012: 63%).

\*The European Commission definition of Small Medium Enterprises (SME) used is defined as being enterprises with less than 250 employees and large companies as being enterprises with more than 250 employees.

### **In-house Business R&D: UK and Regional Comparisons**

Spending carried out within a company in Northern Ireland (in-house), accounted for 92% (£443m) of total business expenditure in 2013, slightly higher than in 2012 (91%).

Of the 12 UK regions, eleven showed an increase in in-house business R&D expenditure in cash terms over the year to 2013, including Northern Ireland which increased by 5.5%. This was the ninth highest percentage increase across the UK regions. In the UK as a whole such expenditure increased by 7.6%. Changes varied from an increase of 37.2% in Wales to a decrease of 9.9% in London.

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**Table 2: In-house Expenditure by UK Government Office Region (Cash Terms)**

	Expenditure (£million)		%Change (2012-2013)
	2013	2012	
UK	18,448	17,144	7.6
England	16,838	15,746	6.9
North East	309	282	9.6
North West	1,785	1,775	0.5
Yorkshire & the Humber	644	600	7.3
East Midlands	1,369	1,242	10.2
West Midlands	1,697	4,462	16.1
East of England	4,071	3,443	18.2
London	1,317	1,461	-9.9
South East	4,195	4,108	2.1
South West	1,452	1,372	5.8
Wales	369	269	37.2
Scotland	798	709	12.6
Northern Ireland	443	420	5.5

### R&D Investment Rate

Regional Gross Value Added (GVA) for 2012 released by the Office for National Statistics (ONS) on the 11th December 2013 shows that Northern Ireland 2013 in-house R&D as a proportion of GVA was 1.5% and was the fifth highest of the twelve UK regions (a lower proportion was recorded in South West (1.4%), North West (1.4%), Wales (0.8%), Scotland (0.8%) Yorkshire and The Humber (0.7%), North East (0.7%), London (0.4%)). Northern Ireland in-house R&D as a proportion of GVA is higher than the UK average rate (1.3%). Regional GVA figures for 2013 are due to be released by ONS on the 10<sup>th</sup> December 2014.

UK R&D results can be found at the following link:

<http://www.ons.gov.uk/ons/taxonomy/index.html?nscl=Research+and+Development+in+Business>

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### Background Notes

#### Northern Ireland Statistics and Research Agency

From the 1st April 2011, the responsibility for the collection of data and production of official labour market and economic statistics transferred from the Department of Enterprise, Trade and Investment to the Northern Ireland Statistics and Research Agency (NISRA), an agency of the Department of Finance and Personnel (DFP). This transfer mirrored the position in Great Britain where most business surveys and labour market data collection and statistical production have been transferred from the departments with policy responsibilities to the Office for National Statistics (ONS). However, it is important to note that there are no planned changes to the production of economic and labour market statistical publications and outputs as a result of the transfer.

#### Background

The survey of Northern Ireland Business Expenditure on Research and Development during 2013 was undertaken by the Northern Ireland Statistics and Research Agency (NISRA). The sample and survey results only cover business enterprises as defined in the Frascati manual. This excludes government organisations, higher education establishments and charities.

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&D) 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 survey covers expenditure in the year ending December 2013, although companies were given the option of supplying data for a business year ending on any date between 6 April 2013 and 5 April 2014.

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.

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### Survey Design

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 2012 survey) and extra information from various sources such as the Office for National Statistics (ONS), Invest NI and filter questions on the Annual Business Inquiry and Community Innovation Survey. For the purposes of the 2013 survey, businesses were stratified into 4 groups:

- (i) Businesses responding to the 2012 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 and Community Innovation Survey; other identified potential R&D performers (principally, those companies who had received assistance from Invest NI during 2013); 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 2013 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.

### Survey Response rate

For 2013, 1,378 forms were sent out to businesses believed to be performing R&D. Completed forms were returned by 1262 businesses representing a response rate of 92 per cent. The total number of companies spending on R&D is relatively small – 535 in 2013 (and 495 in 2012). Estimates were made for the R&D activity of non-responding businesses. Estimates for Invest NI companies were based on the value of offers made to promote R&D investment, the amount remaining to be claimed against these offers, the frequency of claims and the contribution of Invest NI's assistance to total planned R&D expenditure. Estimates for Invest NI companies make up 42% of the total non-respondent companies. The remaining 58% - non Invest NI estimates were based on historical information and other administrative surveys within Economic and Labour Market Statistics Branch.

Overall, all estimates make up 7% of total BERD spend for 2013 (compared to 5% in 2012). Estimates for Invest NI companies account for 1% of total BERD spend while estimates for non Invest NI companies account for 6% of total BERD spend. This should be borne in mind when considering the results.

The results are provisional and may be revised should additional information become available. Figures contained within all tables in this release may not add due to rounding. Percentages calculated on these rounded figures may differ from those that are detailed in the text.

Figure 2: Deciles of Estimates as a percentage of 2013 BERD

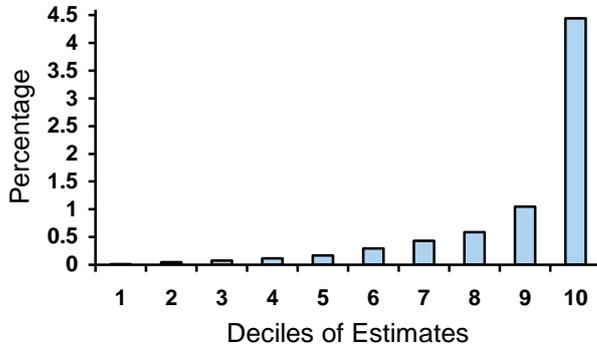


Figure 2 shows that all estimates made up 7% of total 2013 BERD spend. When estimates are ranked according to ascending size of spend, the last two deciles (i.e. the top 20% of companies) accounted for 76% of the total BERD estimated spend indicating that most of the estimates were small in magnitude. The bulk of the value of the estimates has been accounted for by a relatively small number of companies.

**Definition of Terms**

**Type of R&D Expenditure**

Total Expenditure on R&D - This covers expenditure by businesses, expenditure by higher education and other expenditure by Government.

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 report. By utilising Forward Look data in conjunction with the results from the NISRA 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 1, expenditure by businesses and higher education and other expenditure by Government, should compliment each other; i.e. there should be no double counting.

In-house R&D – This is R&D carried out within the company and was previously referred to as intramural expenditure.

Purchase of 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 and was previously referred to as extramural expenditure.

Capital Expenditure - Includes companies' expenditure on land, buildings, equipment 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

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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.

### Results

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 2007 (or SIC 2007) of industries. More details on SIC 2007 are available at the link below.

<http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html>

### Next Publication

Detailed analysis of the 2013 results will be published online at <http://www.detini.gov.uk/deti-stats-index/stats-surveys/stats-research-development.htm> on 30 December 2014.