

# The Higher Education R&D Survey 2006 (HERD)

First Findings

August 2007

## Introduction

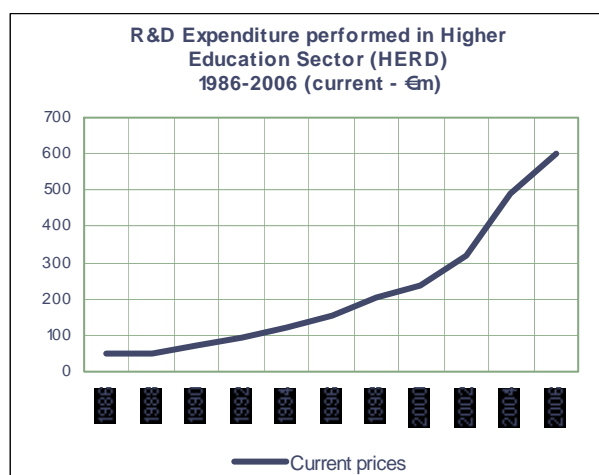
This publication presents first findings from the latest Forfás survey of research and development (R&D) activities performed across the higher education sector in Ireland (HERD survey). The reference period for the survey is the academic year beginning September 2005 and ending August 2006. The survey is carried out by Forfás using the strict international rules outlined in the OECD Frascati Manual, and under the statistical regulations outlined by Eurostat. More detailed analysis and international R&D benchmarking, will be published over the coming months.

## Summary of Results:

- R&D spending performed in the higher education sector (HERD) rose to €600.6 million in 2006, from the €492 million total recorded in 2004.
- Higher Education (HE) performed R&D spending growth averaged 10.5% in nominal terms between 2004 and 2006. In constant terms, stripping out the effects of inflation, the average annual HERD growth rate was 7% in this period.
- Strong increases in R&D spending growth in the HE sector from 2004-2006 resulted in an edging up of the R&D intensity ratio to 0.40% of GNP. This intensity level is now at the OECD average and above the EU27 average.
- The main funding drivers of the overall rise in R&D spending performed in the HE sector were from the public side. Direct funding of HERD from Irish Exchequer sources increased by 14.4% per annum on average between 2004 and 2006.
- Science Foundation Ireland was the largest public funder of research performed in the HE sector in 2006, contributing €107.6 million.
- The total number of researchers in headcount terms rose to 10,067 in 2006, representing an annual average increase of 6.2% compared to 2004. Full-time equivalent research numbers climbed to 4,670 in 2006.
- The number of PhD qualified researchers increased to 5,733 (in headcount terms) in 2006 from the 5,024 recorded in 2004.

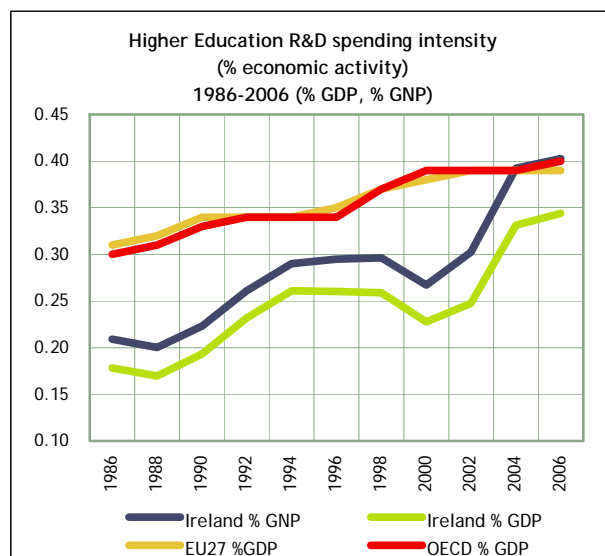
## R&D Spending

Spending on R&D in the higher education sector in Ireland grew to €600.6 million in 2006. This represented an average annual rise of 10.5% compared to the €492mn of R&D expenditure performed in the sector in 2004. Growth in constant prices (stripping out the effects of inflation) averaged 7% per annum between 2004 and 2006. R&D spending performed by universities increased to €568.2 million in 2006 in current price terms, with R&D performed in the Institutes of Technology rising to €32.4 million.



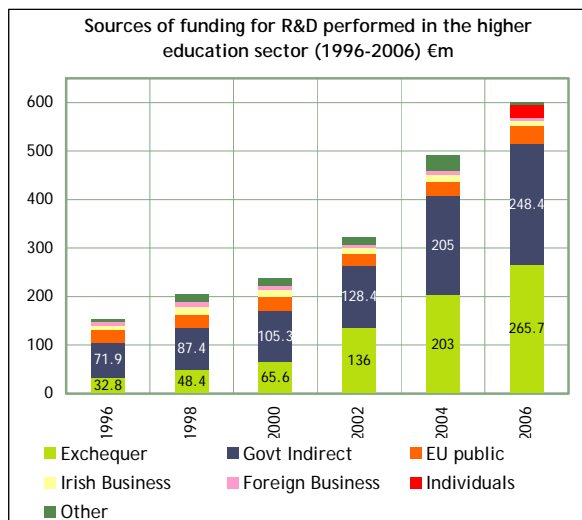
## R&D Intensity

The rapid acceleration in the growth of R&D spending performed in the higher education sector from 2000 onwards has resulted in a closing of the sectoral R&D intensity gap with international competitors. The HERD spending intensity ratio (spending as a percentage of economic activity) rose to 0.40% of GNP in 2006, slightly above the EU27 average HERD intensity ratio, and now at the OECD average level.



## Sources of funding

Increased funding from the public side continued to be the main driver of the improved R&D spending performance in the HE sector in 2006. Direct funding for higher education R&D programmes from the Irish exchequer rose to €265.7 million in 2006, representing an average annual increase of 14.4% from 2004.



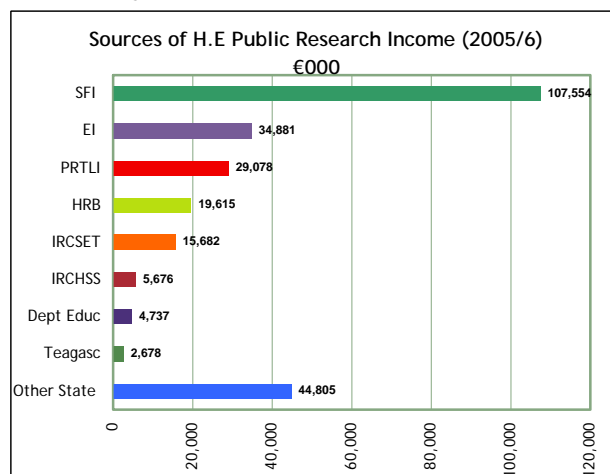
R&D funding sourced from the indirect source of the Higher Education Authority (HEA) block grant increased to €248.4 million in 2006. Finally on the public funding side, R&D funded via European Union sources climbed to €38.2 million in 2006. The next largest contributor to R&D activity in the HE sector was from individuals, with €27.1 million funded from this source. An additional €16 million of R&D was sourced from businesses.

## Reported Public Research Income

Looking at the public sources of research income (€265.7 million) for R&D performed in the HE sector in more detail, the figures show that the largest source of R&D funding was from Science Foundation Ireland (SFI) programmes. SFI funding for these programmes rose to €107.6 million in the academic year 2005/6 (40.5% of total public funding for HE performed R&D). The next largest contributor to R&D activity in the HE sector was from Enterprise Ireland, whose programmes and initiatives funded €34.9 million of R&D in 2005/6.

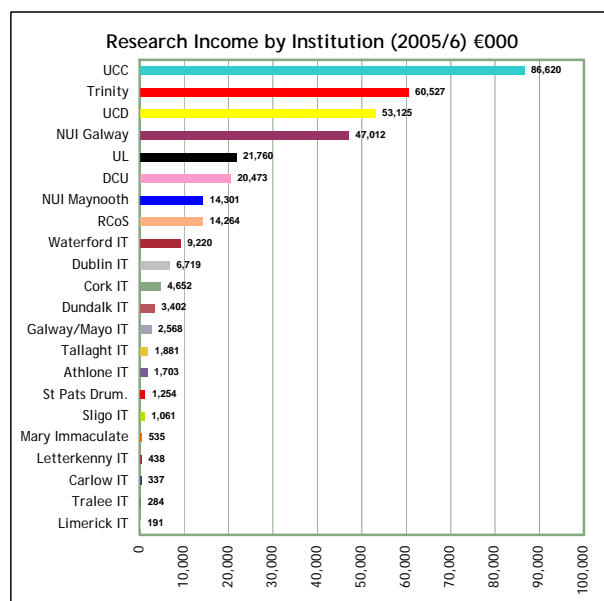
The HEA's PRTLTI scheme was the source of funding for €29.1 million of HERD in 2006 (some Capital expenditure in addition is also included in the indirect sources of funding), whilst the Health Research Board funded €19.6 million of activity. The Irish Research Councils for Science, Engineering and Technology (IRCSET) and for Humanities and Social Sciences (IRCHSS),

contributed €15.7 million and €5.7 million respectively in 2005/6.



## Reported Research Income by Institution

R&D spending and performance across the HE sector was conducted across a wide range of academic institutions in 2005/6. The largest recipient of direct funding for R&D activities was University College Cork, which received €86.6 million of reported direct research income in 2005/6. Trinity College Dublin received €60.5 million of direct research income in 2005/6, with University College Dublin and NUI Galway receiving €53.1 million and €47.0 million of reported direct research income respectively in the same period.

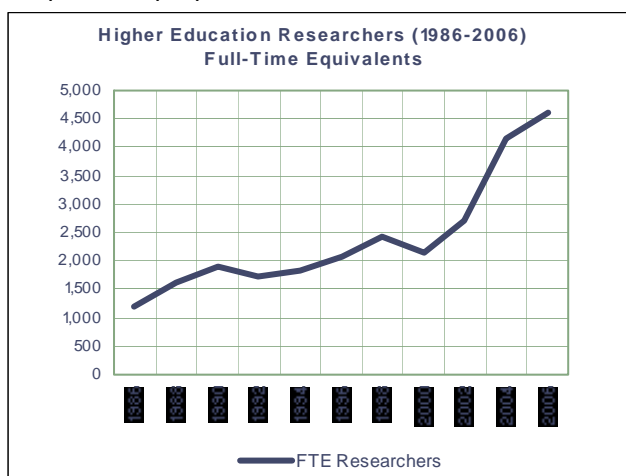


The two largest recipients of direct research income among the Institutes of Technology were Waterford IT and Dublin IT. These institutions received €9.2 million and €6.7 million for R&D programmes in 2005/6 from direct sources.

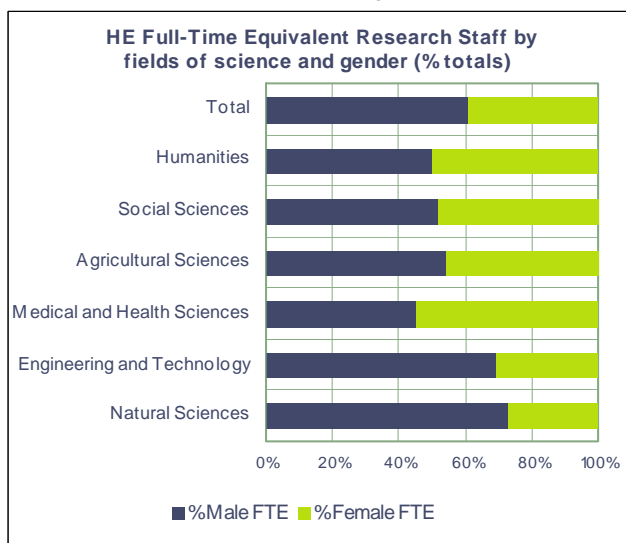
## R&D Human Resources

The total number of higher education staff working on research projects rose to 10,067 in headcount terms in 2005/6. These research-active staff were supported by an additional 4775 staff, resulting in a total research personnel of 14,842 in the higher education sector in 2005/6. Researcher numbers increased by an annual average of 6.2% between 2004 and 2006.

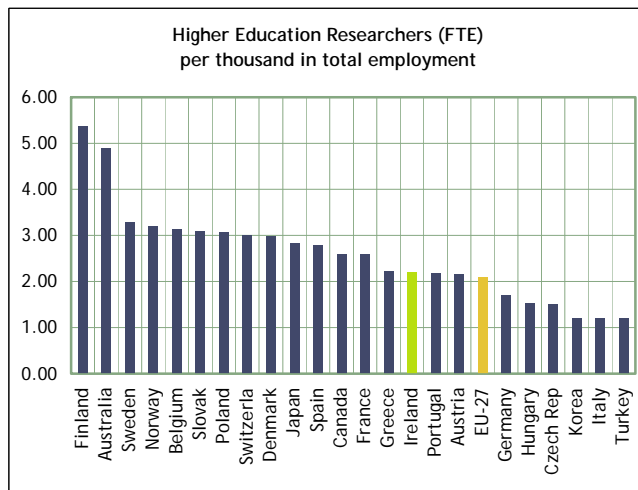
In order to adjust for the differences in the time spent on research activities, a time use survey was conducted to convert headcount data into full-time equivalent data (FTE). This measure is a more meaningful indicator for international comparative purposes.



Adjusted headcount data for researcher numbers in the higher education sector shows that total researchers in FTE terms rose by an annual average of 5.6% between 2004 and 2006, to total 4,670. An additional 929 FTE support staff assisted these researchers in that year with total FTE research personnel totalling 5,598.



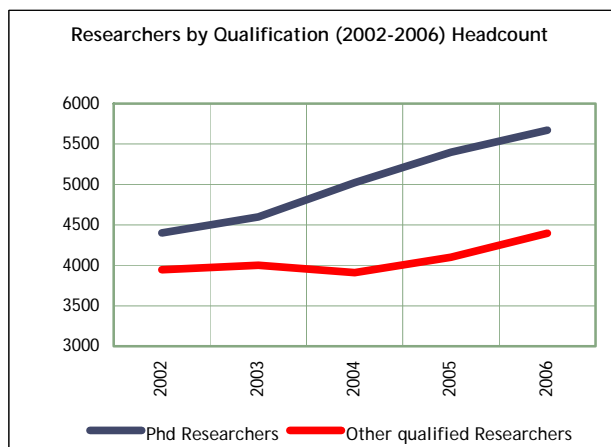
In international terms the 4,670 FTE researchers equated to a ratio of 2.2 FTE researchers per thousand in total employment in 2006. The ratio has increased rapidly from 1.2 in 2000, though remained static between 2004 and 2006.



In international terms Ireland has moved into a third tier of countries in researcher intensity. Despite being above the EU 27 average, Ireland remains below the global leaders of Finland and Australia which have FTE ratio of 5.4 and 4.9, and also below a second tier of countries where researcher intensity is between 2.5 and 3.0. It should be noted that Ireland does not count PhD students as staff-employed "researchers" unlike some other EU countries.

## PhD qualified researchers

The number of PhD qualified researchers employed in the higher education sector rose to 5,733 in headcount terms in the academic year 2005/6.



Male PhD qualified research staff totalled 3,760 in headcount terms in 2006 (65.6% of total staff), with 1,973 female qualified PhD staff (34.4% of the total PhD qualified research staff).

## Definitions

Definitions of the terms used are as follows:

- **Research and Development (R&D)** includes creative work undertaken on a systematic basis in order to increase the stock of knowledge, and the use of this knowledge to devise new applications. Scientific R&D is distinguishable from other activities by the presence of an appreciable element of novelty and by the resolution of problems and uncertainties using scientific or technological means. Social Science and Humanities R&D is calculated when the novel activity results in an increase in the stock of knowledge, including the knowledge of man, culture and society.
- **Researchers** are professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, and also in the management of the projects concerned. In the higher education sector, researchers can be grouped into occupational classifications of permanent academic staff, PhD fellows, research assistants and contract lecturers. PhD students are not included in researcher numbers in Ireland.
- **Research Personnel** includes all human resources devoted to the conception or creation of new knowledge. As well as the researchers (defined above), research personnel includes technicians, support staff and administrative or other staff who supported research staff conduct their work.
- **Full time equivalence (FTE)** is the methodology used to convert and adjust researcher and research personnel headcount data to a more comparable full-time equivalence number. This is calculated by assessing the time spent on research activities by research personnel and multiplying the headcount number by this co-efficient. A researcher spending 50% of time on research is therefore counted as 0.5 FTE.

## Methodology

Surveys were sent to seven universities, 12 institutes of technology and to four other research active higher education institutions. Data was collected at the departmental level, with careful consideration given to issues of double-counting. A full response rate was achieved for all those institutions surveyed. Rigorous methodological checks were carried out on the data obtained, with several follow up interviews (telephone, electronic and face-to-face) carried out.

## Notes (web-links)

- 1 Further Forfás releases on research and development and science and technology are available for download at: [http://www.forfas.ie/publications/\\_category/science.html](http://www.forfas.ie/publications/_category/science.html)
- 2 This survey is completed as part of the EU research and development surveys and uses the Eurostat core questionnaire used by the EU 27. Other R&D surveys are conducted in the business, government and hospital sectors.
- 3 Data are gathered obeying the strict international methodological guidelines as laid out in the OECD Frascati manual which can be downloaded at the following: [http://www.oecd.org/document/6/0,3343,en\\_2649\\_34451\\_33828550\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/6/0,3343,en_2649_34451_33828550_1_1_1_1,00.html)

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