

HIGH-LEVEL KEY RESULTS



National **Survey** of Research and Experimental Development **2007/08**



**science
& technology**

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November 2009



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* or latest year available

PREFACE

The National Survey of Research and Experimental Development (R&D) is conducted annually by the Human Sciences Research Council's Centre for Science, Technology and Innovation Indicators (CeSTII) on behalf of the Department of Science and Technology.

R&D Surveys provide data collected under strict conditions of confidentiality that is essential for planning at system and institutional level and provide snapshots of key indicators of national competitiveness. The R&D Surveys involve the collection of primary data from the public and private sectors. The public sector includes universities, science councils and government department based research institutes, and the

private sector includes firms and not-for-profit organisations.

Between 2001 and 2006, there had been a steady increase in South Africa's gross expenditure on R&D (GERD), which went from 0.73% to 0.95% of GDP. However, the current Survey points to a slight decrease in GERD to 0.93% of GDP. In the same period, the South African economy performed favourably, attaining a GDP growth rate of around 5% and sustained employment growth from the beginning of 2005, which peaked in the third quarter of 2008. The R&D Survey results indicate that both the investment in R&D and the growth in number of researchers lagged

behind these important developments. These observations will be carefully analysed to identify any emerging trends and to inform appropriate policy responses that may be needed, especially if we are to attain the target of GERD reaching 1% of GDP.

The next R&D Survey will cover the period 2008/09. The R&D Surveys, together with the findings from the Innovation Survey, provide the necessary data to assist my Department to make informed decisions and to fulfil its leadership role in the national system of innovation.

We extend our appreciation to the CeSTII

project team for their continued efforts. A special word of thanks goes to all the survey respondents in the higher education sector, science councils, government, not-for-profit sectors and the many senior executives in the business sector who give their time so readily to make this survey a success.



Mrs GNM Pandor, MP
Minister of Science and Technology



NOTE ON METHODOLOGY

This publication comprises the high-level results of the 2007/08 Research and Experimental Development (R&D) Survey. This survey follows the Frascati Manual Guidelines developed by the Organisation for Economic Co-operation and Development (OECD). These guidelines provide best practice advice on how to define research and experimental development and the boundaries between the different R&D performers.

The 2007/08 R&D Survey comprised a census across Higher Education institutions, department based research institutes and Science Councils, and purposive surveys across not-for-profit organisations and the business sector. In keeping with previous practice, state owned enterprises that sell their goods or services at market prices are included in the business sector.

The R&D Surveys are a component of Official Statistics as defined in the Statistics Act No. 6 of 1999. This status imposes strict requirements on the survey regarding the confidentiality of responding organisations.

An electronic version of this publication is available at www.hsrc.ac.za/CCUP-RnD-7.phtml and <http://www.dst.gov.za/publications-policies/r-d-reports>. Any revisions of data will be provided on these sites.

TABLE 1: KEY FIGURES

INDICATOR	Value	Value
	2006/07	2007/08
Gross expenditure on R&D - GERD (Rand Millions)	16 520.6	18 624.0
Gross domestic product (GDP) at market prices (Rand Millions)	1 741 060	1 999 086
GERD as a percentage of GDP	0.95	0.93
Basic research as a percentage of GDP	0.18	0.19
Total R&D personnel (FTE) ^a	30 986	31 352
Total researchers (FTE) ^b	18 572	19 320
Total researchers per 1000 total employment (FTE) ^c	1.5	1.5
Total R&D personnel per 1000 total employment (FTE)	2.5	2.4
Civil GERD as a percentage of GDP	0.89	0.87
Total researchers (headcount)	39 591	40 084
Women researchers as a percentage of total researchers	39.7	40.3

a FTE = Full Time Equivalent

b Following OECD practice, doctoral students are included as researchers

c Total employment is provided by the OECD from the International Labour Organisation based on the Labour Force Surveys of Statistics South Africa.

SOURCES: South African National R&D Surveys and Statistics South Africa P0441 Gross Domestic Product, First Quarter 2009.

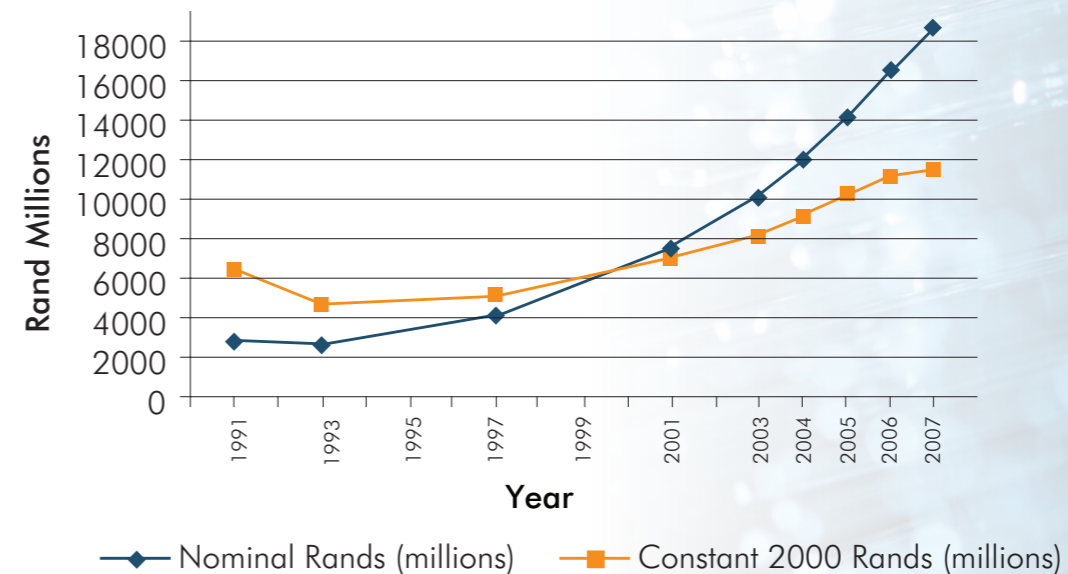
R&D expenditure in South Africa has shown a steady growth in both nominal and real terms since 1993. Between 2006/07 and 2007/08 total R&D expenditure increased from R16.520 billion to R18.634 billion. This represents a nominal annual increase of about 12.8% (compared with a 16.8% increase between 2005/06 and 2006/07). In real terms (constant year 2000 Rand) R&D expenditure increased by 3.1% which is less than the 8.7% increase between 2005/06 and 2006/07.

SOURCE: South African National R&D Surveys

NOTE: National R&D surveys were not undertaken in 1995, 1999 and 2002. Since 2003 the National R&D survey has been undertaken on an annual basis.

FIGURE 1

Gross Expenditure on R&D (GERD)
(South Africa, 1991-2007)

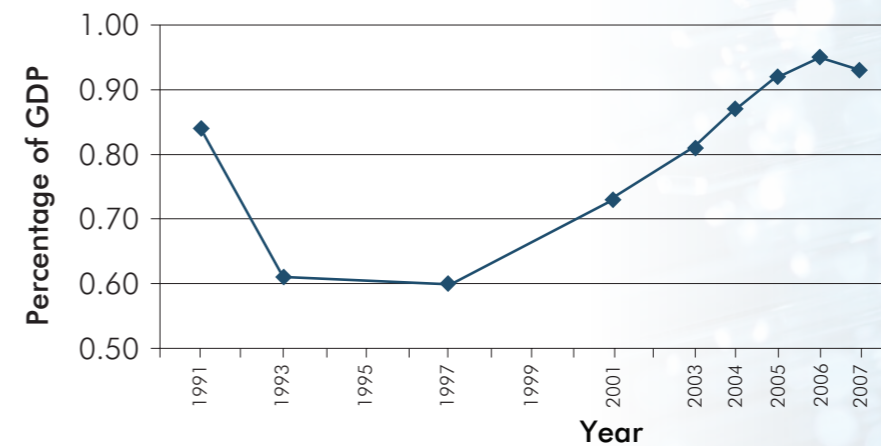


Gross national expenditure on R&D (GERD) expressed as a percentage of GDP provides an indication of the concentration or intensity of R&D in an economy. There has been a steady increase in GERD as a percentage of GDP from 0.60% in 1997 to 0.95% in 2006. The current figures show that GERD as a percentage of GDP decreased slightly from 0.95% in 2006/07 to 0.93% in 2007/08.

SOURCE: South African National R&D Surveys and Statistics South Africa P0441 Gross Domestic Product, First Quarter 2009.

FIGURE 2

Gross Expenditure on R&D as a percentage of GDP (Revised)
(South Africa, 1991-2007)

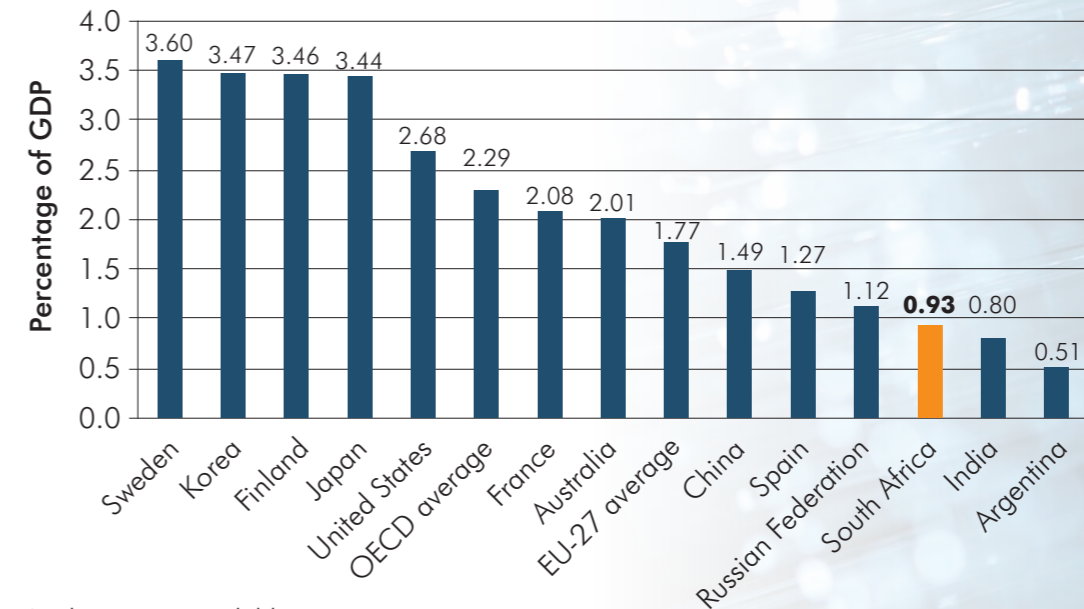


Few OECD countries have a GERD equivalent to less than 1% of GDP. Leading countries in R&D intensity such as Sweden, Korea, Finland and Japan have R&D expenditures exceeding 3% of GDP. China has shown an impressive R&D performance over the years with its R&D intensity growing from 0.95% in 2001 to 1.49% in 2007. South Africa compares well with other developing countries such as India and Argentina which had R&D expenditures equivalent to 0.80% and 0.51% of GDP in 2007, respectively.

SOURCE: International comparisons – OECD Main Science and Technology Indicators, (2009/01 Edition). Data for India is from UNESCO Institute for Statistics (UIS).

FIGURE 3

Gross Expenditure on R&D as a percentage of GDP 2007*
(international comparison)



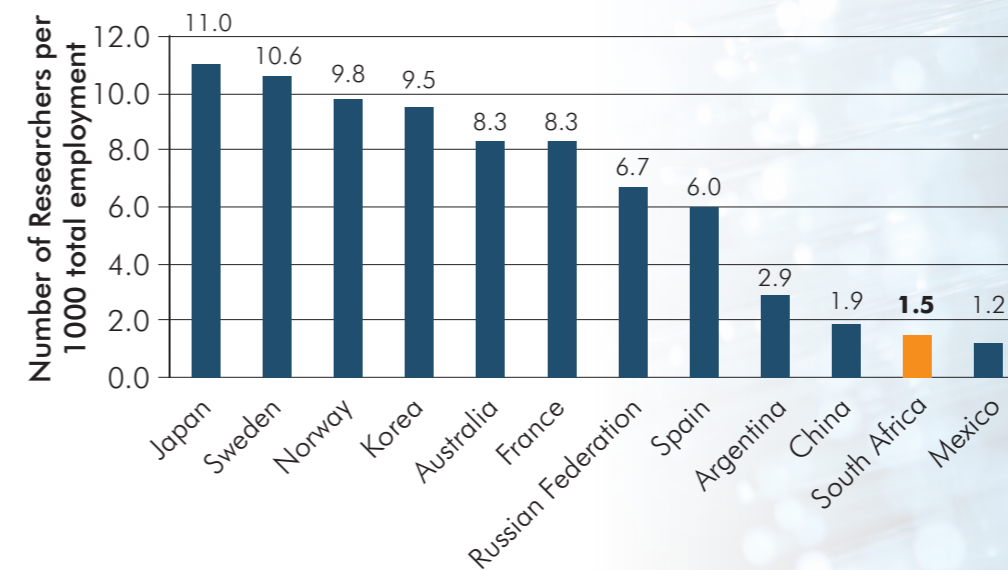
*or latest year available

South Africa has a total of 1.5 FTE researchers per 1 000 total employment. Compared to other countries this key indicator continues to remain at a relatively low level. This indicator needs to be monitored in view of the importance of the goal of increasing the number of science and engineering graduates in the country

SOURCE: International comparisons – OECD Main Science and Technology Indicators, (2009/01 Edition)

FIGURE 4

Number of Full Time Equivalent (FTE) researchers per 1000 total employment in 2007*
(International comparison)



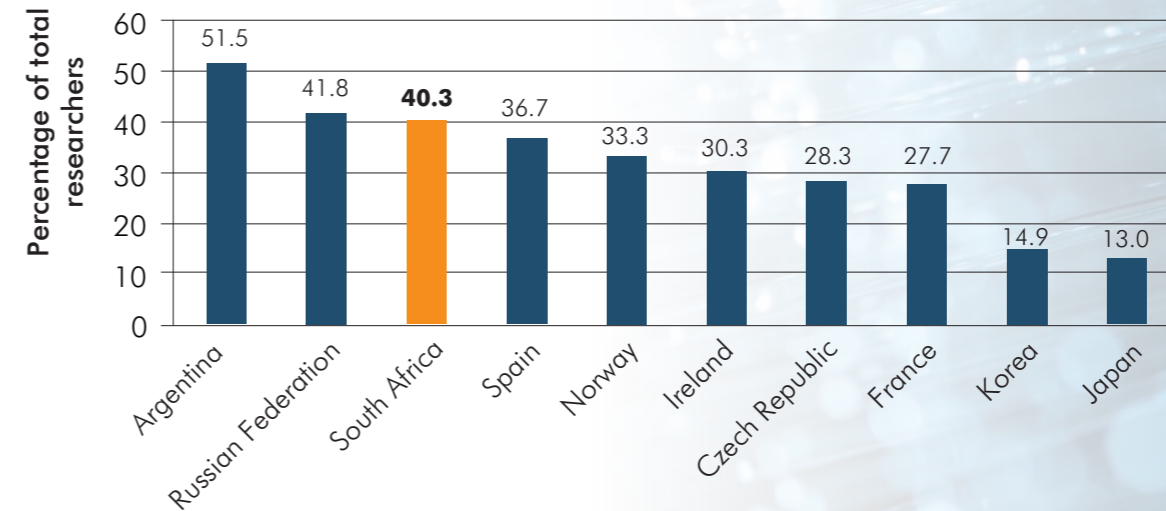
*or latest year available

The number of women researchers as a percentage of total researchers in South Africa has increased slightly from 39.7% in 2006/07 to 40.3% in 2007/08. Of the countries that report on this indicator Argentina and Russia continue to lead the way with women researchers comprising 51.5% and 41.8% of total researchers respectively.

SOURCE: International Comparisons – OECD Main Science and Technology Indicators (2009/01 Edition)

FIGURE 5

Women researchers as a percentage of total researchers (headcount) 2007*
(International comparison)



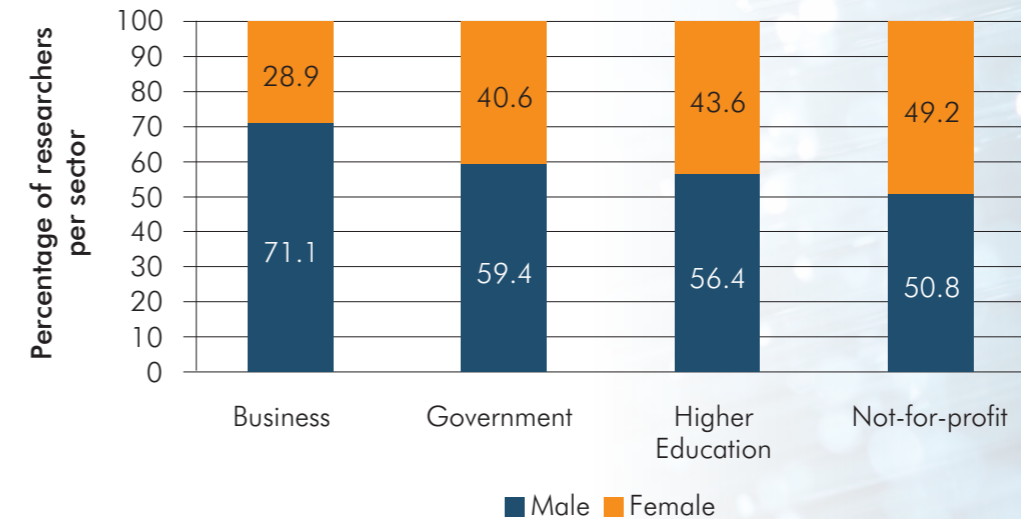
*or latest year available

The not-for-profit sector employs the largest percentage of women researchers (49.2%), followed by the higher education sector (43.6%), government, including the science councils at 40.6% and the business sector (28.9%). The government sector had indicated a slight increase with women researchers accounting for 40.6 % of researchers in 2007/08 compared with the 39.6% reported for the 2006/07 survey. During this period, the representation of women researchers also increased slightly in the higher education sector from 42.9% to 43.6%

SOURCE: South African National Research and Experimental Development Survey 2006/07 and 2007/08.

FIGURE 6

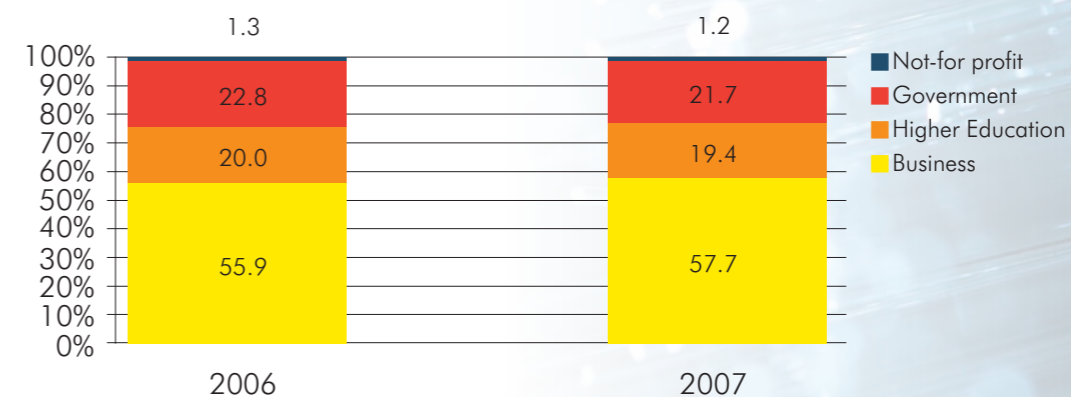
Women researchers as a percentage of total researchers (headcount) per sector (South Africa, 2007)



The business sector is the largest R&D performing sector in South Africa and its expenditure on R&D (BERD) as a percentage of total R&D expenditure amounted to 57.7% for 2007/08. This is an increase over the 55.9% for the previous year. Higher education's share of R&D performance dropped slightly by 0.6%. The government sector's share of R&D expenditure also showed a small decrease of 1.1%. The not-for-profit sector's share of R&D performance dropped from 1.3% in 2006/07 to 1.2% in 2007/08.

SOURCE: South African National Research and Experimental Development Survey 2006/07 and 2007/08.

FIGURE 7
Performance of R&D by Sector
(South Africa, 2006 & 2007)



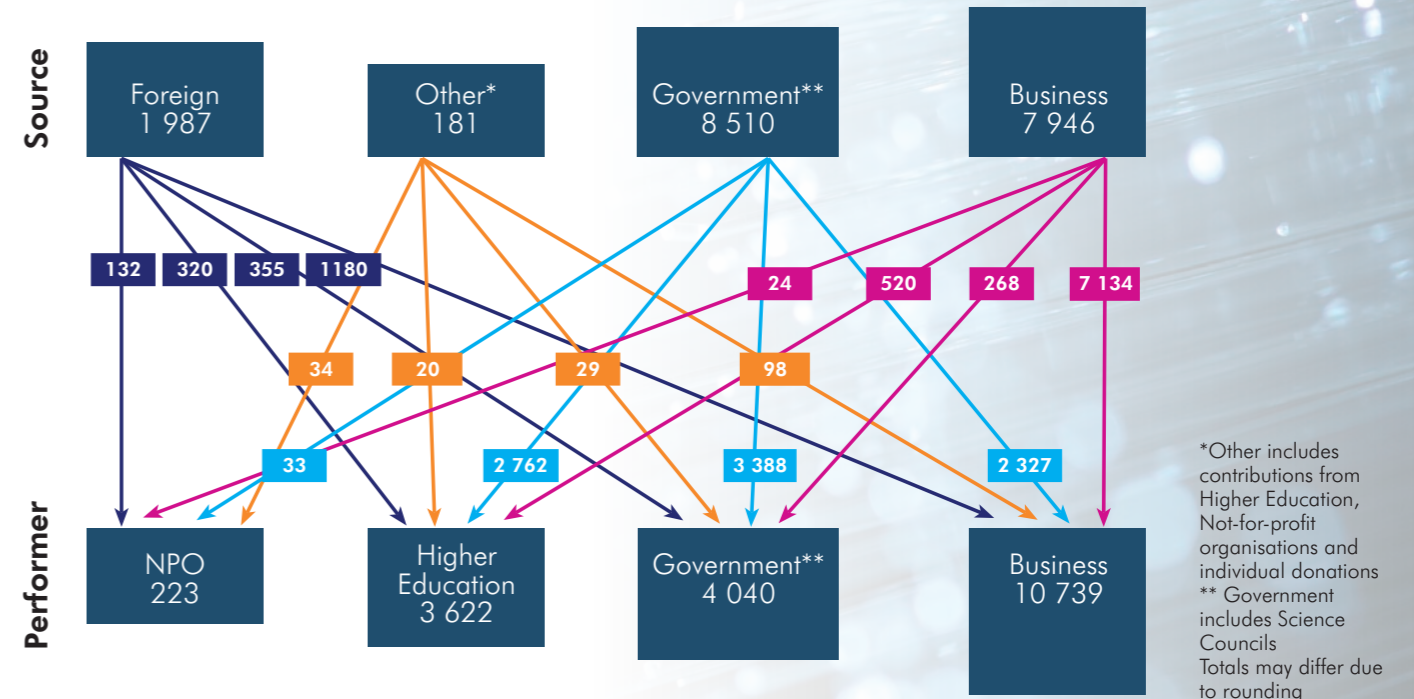
Expenditure (R 000s)	Business	Higher Education	Government	Not-for Profit	Total
2006	9 243 165	3 298 808	3 766 073	212 538	16 520 584
2007	10 738 456	3 621 862	4 040 493	223 202	18 624 013

The business sector continues to be the largest performer of R&D with R&D expenditure of R10.74 billion in 2007/08. Government follows at R4.04 billion and higher education at R3.62 billion. The business sector was previously the largest source of R&D funding in South Africa, accounting for 44.8% of total R&D funding in 2006/07. In 2007/08 business provided R&D funding of R7.95 billion or 42.7% of the total. Between 2006/07 and 2007/08 government funding of R&D increased from R6.67 billion to R8.51 billion. The results indicate that the government share of funding of R&D has increased from 40.4% in 2006/07 to 45.7% in 2007/08, making government the largest source of funds for R&D. Foreign funding of R&D increased from R1.75 billion (or 10.6%) in 2006 to R1.99 billion (or 10.7%) in 2007.

SOURCE: South African National Research and Experimental Development Survey 2006/07 and 2007/08.

FIGURE 8

Major flows of funding for R&D in South Africa, 2007/08 (R millions)

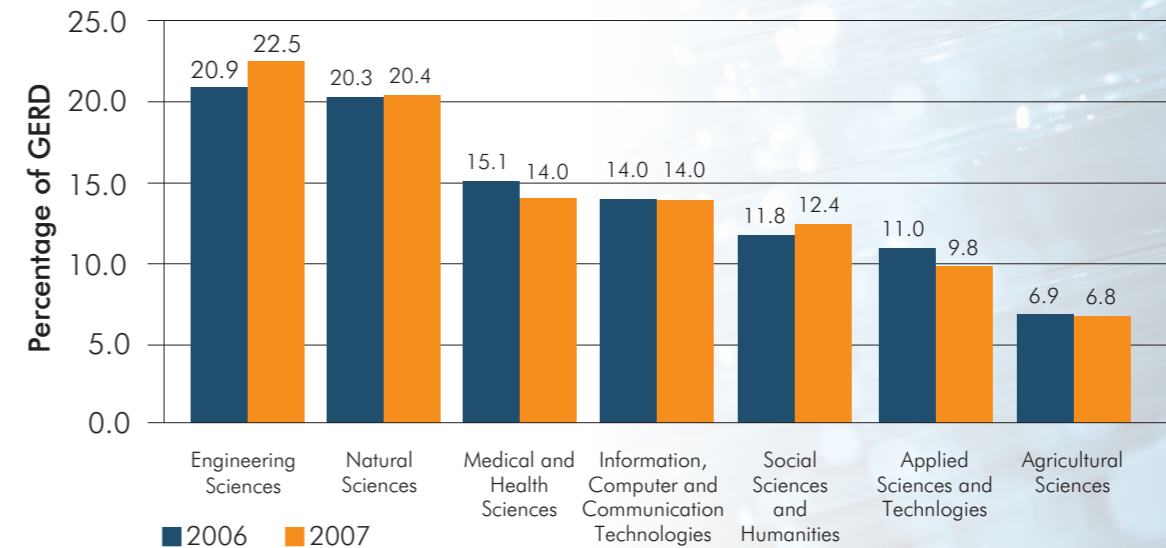


R&D expenditure in the engineering sciences increased from 20.9% of total R&D expenditure in 2006/07 to 22.5% in 2007/08. The social sciences also increased their share of R&D performance from 11.8% of the total in 2006/07 to 12.4% in 2007/08. R&D expenditure in the natural sciences increased slightly from 20.3% in 2006/07 to 20.4% in 2007/08. R&D expenditure on information, computer and communication technologies remained constant at 14.0% of the total. The medical and health sciences, agricultural sciences, and applied sciences and technologies all showed a slight decrease in their shares of R&D expenditure.

SOURCE: South African National Research and Experimental Development Surveys 2006/07 and 2007/08

FIGURE 9

Expenditure on R&D by major research field
(South Africa, 2006 & 2007)

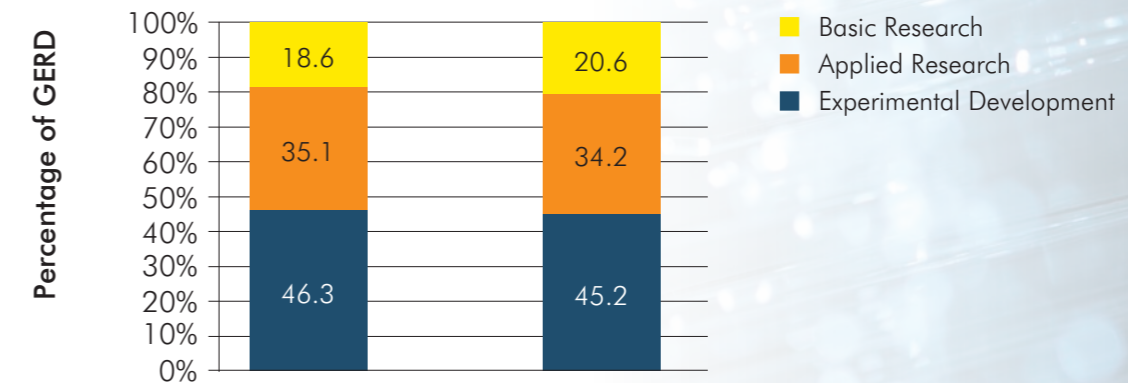


R&D expenditure on experimental development accounted for 45.2% of total R&D expenditure for 2007/08, down from the 46.3% of 2006/07. The share of R&D expenditure on applied research also dropped from 35.1% to 34.2%. The share of R&D expenditure devoted to basic research increased from 18.6% in 2006/07 to 20.6% in 2007/08.

SOURCE: South African National Research and Experimental Development Surveys 2006/07 and 2007/08.

FIGURE 10

Gross Expenditure on R&D by type of research
(South Africa, 2006 & 2007)

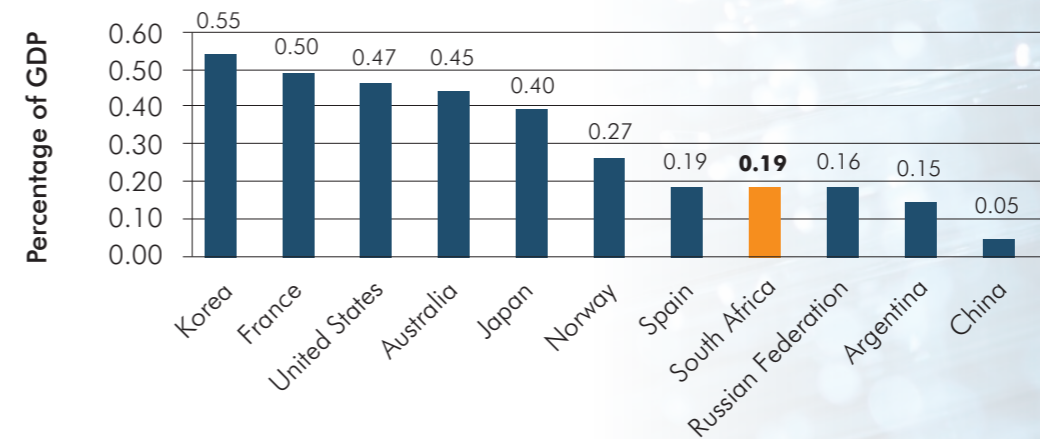


Basic research expenditure (as a percentage of GDP) is an important indicator of a country's potential to use R&D to adapt to new challenges and produce new knowledge. South Africa's expenditure on basic research as a percentage of GDP increased from 0.18% in 2006/07 to 0.19% in 2007/08.

SOURCE: International comparisons – OECD Main Science and Technology Indicators, (2009/01 Edition)

FIGURE 11

Basic Research as a percentage of GDP 2007*
(International comparison)



*or latest year available

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Report available at: www.hsrc.ac.za/CCUP-RnD-7.phtml and <http://www.dst.gov.za/publications-policies/r-d-reports>.
More detailed data extracts beyond the above and that conform to the required standard of confidentiality are available on request to HSRC CeSTII.

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