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HIGH LEVEL KEY RESULTS

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NATIONAL **SURVEY** OF RESEARCH AND EXPERIMENTAL DEVELOPMENT **2006/07**

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DEPARTMENT OF SCIENCE AND TECHNOLOGY

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PREFACE

The 2006/07 National Survey of Research and Experimental Development (R&D) is the fourth survey conducted under the aegis of the Ministry of Science and Technology.

R&D Surveys provide data, collected under strict conditions of confidentiality, which are essential for planning at system and organisational level, and provide snapshots of key indicators for national competitiveness.

The 2006/07 Survey, in common with its predecessors involves the collection of primary data from the public and private sectors. The public sector comprises universities, science research councils and department based research institutes. The private sector comprises firms and not-for-profit organisations. In the case of firms, the number reporting R&D increased by nearly 12%, mainly comprising small R&D performers. As noted previously this increased response is because of improved survey capability and capacity, and the interest and commitment of many organisations and firms that were approached to provide the required information.

The 2005/06 R&D Survey showed that South Africa's gross expenditure on R&D (GERD) was just over R14.1 billion that amounted to 0.92% of GDP. The 2006/07 R&D Survey reveals GERD of R16.5 billion amounting to 0.95% of GDP that reflects a growth in this important indicator of 3.3%. The target of GERD: GDP reaching 1% by survey year 2008/09 is now becoming closer to attainment.

The next R&D Survey will cover the period 2007/08. The Department has also commissioned the second official Innovation Survey that is currently in the field, covering the years 2005-2007. The R&D Survey time series together with the data of the Innovation Survey contribute toward providing the necessary evidence base for my Department to make better decisions concerning its enabling role as a lead actor in the national system of innovation.

The Centre for Science, Technology and Innovation Indicators (CeSTII) of the Human Sciences Research Council carries out these surveys for the Department. 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 so readily of their time to make this survey a success.

Mosibudi Mangena
Minister of Science and Technology
September 2008

A NOTE ON METHODOLOGY

This publication comprises the high-level results of the 2006/07 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 2006/07 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 National Statistics and protected under the Statistics Act No. 6 of 1999. This imposes strict requirements on the survey regarding the confidentiality of responding organisations.

The full results of the 2006/07 R&D Survey will be made available at: http://www.dst.gov.za/publications-policies/r-d-reports and http://www.hsrc.ac.za/CESTII.phtml

More detailed data extracts beyond the above and that conform to the required standard of confidentiality are available on request to HSRC CeSTII.

TABLE 1:
Key figures

Indicator	Value 2005/06	Value 2006/07
Gross domestic expenditure on R&D - GERD (Rand millions)	14 149.2	16 520.6
Gross domestic product (GDP) at market prices (Rand millions)	1 541 067	1 741 060
GERD as a percentage of GDP	0.92	0.95
Total R&D personnel (FTE)[a]	28 798	30 986
Total researchers (FTE)[b]	17 303	18 572
Total researchers per 1000 total employment (FTE)[c]	1.5	1.5
Total R&D personnel per 1000 total employment (FTE)	2.4	2.5
Civil GERD as a percentage of GDP	0.86	0.89
Total researchers (headcount)	39 264	39 591
Women researchers as a percentage of total researchers	39.2	39.7

a FTE = Full-time Equivalent
b Following OECD practice, doctoral students are included as researchers
c Following OECD practice, total employment is now provided by the International Labour Organisation based on the Labour Force Surveys of Statistics South Africa and is not restricted to the formal non-agricultural sectors as previously reported.

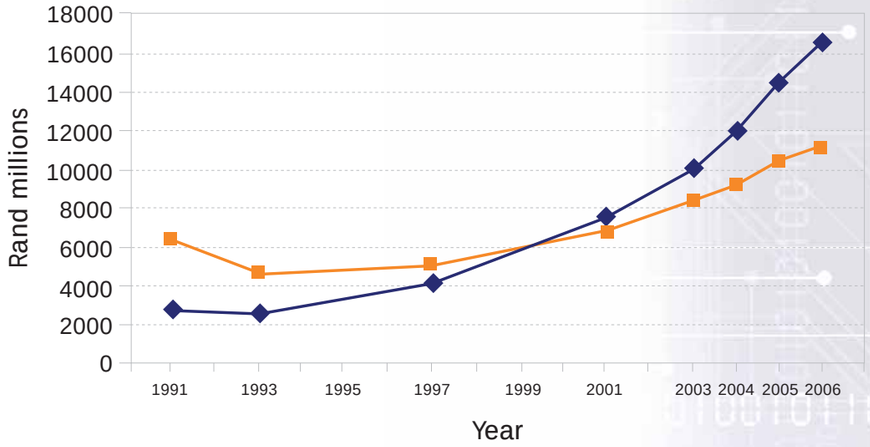
SOURCES: South African National R&D Surveys and Statistics South Africa P0441 Gross Domestic Product, First Quarter 2008.

R&D expenditure has been showing a steady growth in both nominal and real terms since 1993. Between 2005/06 and 2006/07 total R&D expenditure in South Africa increased from R14.149 billion to R16.520 billion. This represents a nominal annual increase of about 16.8% and an 8.7% increase in real terms. This increase is due to increased spending by the government, higher education and business sectors; survey coverage was similar to the previous year although there was an increase in the number of small firms reporting.

SOURCE: South African National R&D Surveys

NOTE: National R&D surveys were not undertaken in 1995 and 1999. Surveys were conducted on a bi-annual basis between 2001 and 2003. Since 2003 the National R&D survey is undertaken on an annual basis.

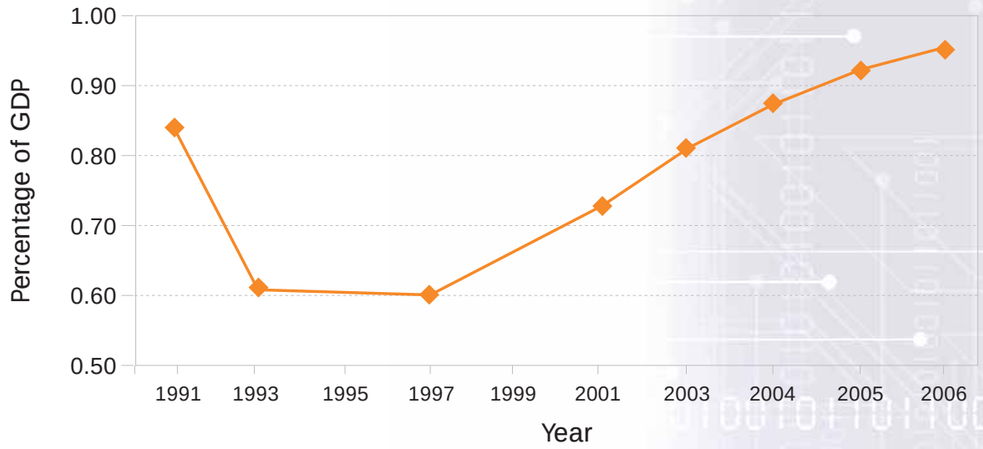
FIGURE 1:
Gross Expenditure on R&D (GERD)
(South Africa, 1991-2006)



Gross domestic 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. These figures indicate an encouraging trend towards reaching the R&D expenditure goal of 1% of GDP by survey year 2008/09.

SOURCES: South African National R&D Surveys and Statistics South Africa P0441 Gross Domestic Product, First Quarter 2008.

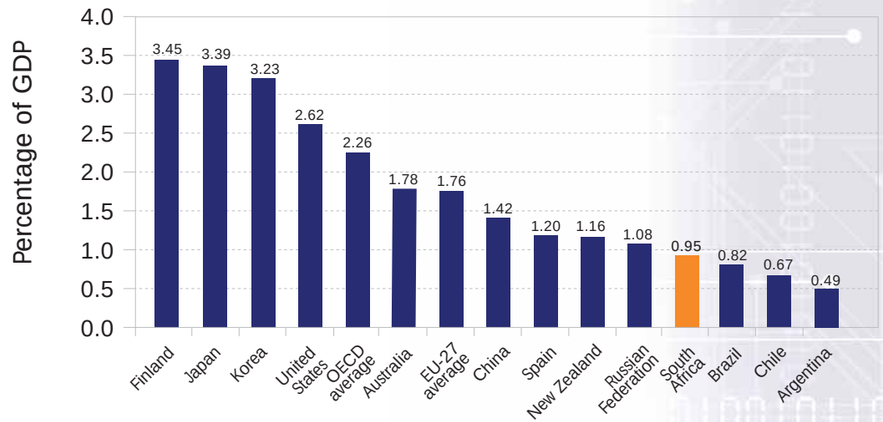
FIGURE 2:
Gross Expenditure on R&D as a percentage of GDP (Revised)
(South Africa, 1991–2006)



South Africa's GERD as a percentage of GDP now stands at 0.95%. There has been a steady increase in GERD expressed as a percentage of GDP between 2001 and 2006 from 0.73% to 0.95% respectively. By comparison, Spain stood at 0.91% in 2001 and R&D expenditure was 1.20% of GDP in 2006. Few OECD countries have a GERD equivalent to less than 1% of GDP. Leading countries in R&D expenditure such as Finland, Japan and Korea have R&D expenditures exceeding 3% of GDP. China is steadily increasing its R&D performance with R&D expenditure growing from 1.34% of GDP in 2005 to 1.42% in 2006, largely due to the activities of foreign multi-nationals in the country. South Africa compares well with other emerging economies such as Argentina (0.49%), India, which had an R&D expenditure equivalent to 0.69% of GDP in 2004, Hungary at 1.0% in 2004 and Brazil (0.82% for 2005).

SOURCE: International comparisons – OECD Main Science and Technology Indicators, (2008/1 Edition). Data for India, Chile and Brazil from UNESCO Institute for Statistics

FIGURE 3:
Gross Expenditure on R&D as a percentage of GDP 2006*
(International comparison)

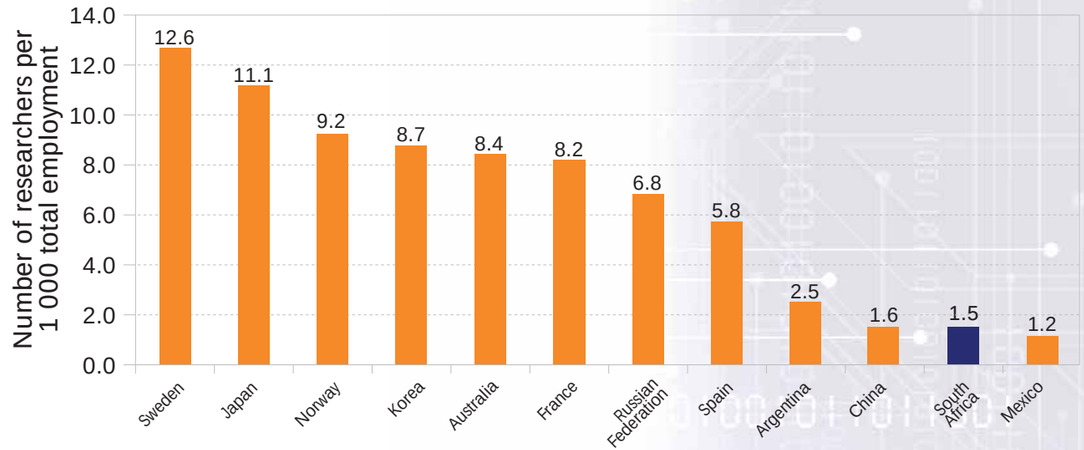


*or latest year available

The 2006/07 survey results indicate that South Africa has 1.5 FTE researchers per 1 000 total employment, the same as in 2005, although the number of FTE researchers has grown by 7.6% during the year. Compared to other countries this indicator of human resource potential for research is relatively low. This indicator needs to be monitored as the research capacity of a country significantly influences its R&D output potential.

SOURCE: International comparisons – OECD Main Science and Technology Indicators, (2008/1 Edition)

FIGURE 4:
Number of Full Time Equivalent (FTE) researchers per 1 000 total employment in 2006*
(International comparison)

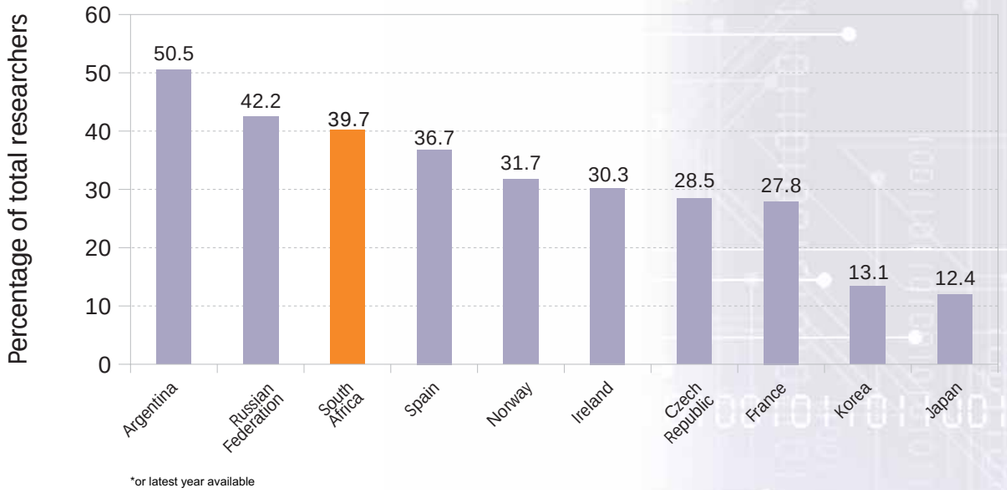


*or latest year available

South Africa showed a slight increase in the number of women researchers as a percentage of total researchers in South Africa between 2005 and 2006, from 39.2% to 39.7%. Most other reporting countries also indicated an average increase of less than 1%.

SOURCE: International Comparisons – OECD Main Science and Technology Indicators (2008/1 Edition)

FIGURE 5:
Women researchers as a percentage of total researchers (headcount) 2006*
(International comparison)

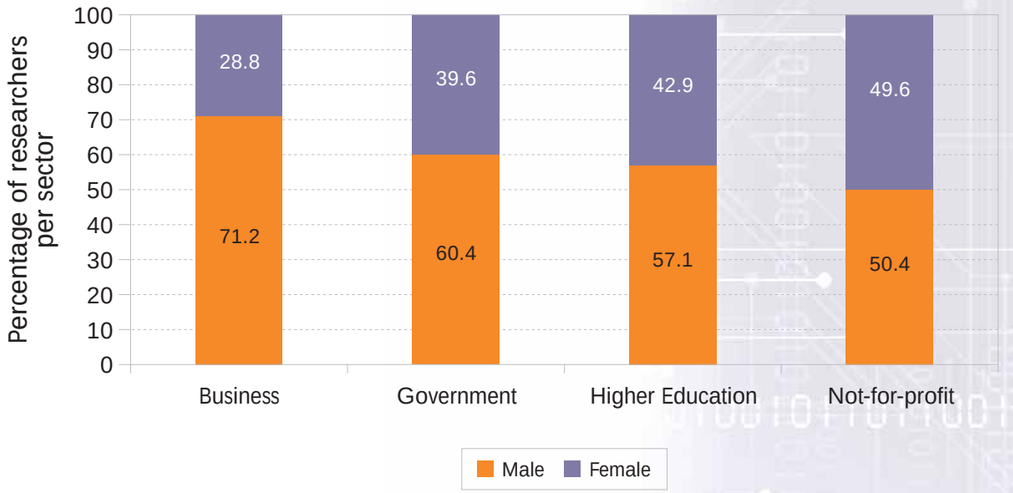


*or latest year available

During 2006/07, the not-for-profit sector employed the largest percentage of women researchers, followed by the higher education sector, government (including the science councils) and the business sector. The not-for-profit sector indicated the biggest increase from the 2005 survey, and women representivity increased from 45.3% to 49.6%. The percentage of women researchers decreased slightly in the business sector from 29.4% to 28.8%.

SOURCE: South African National Research and Experimental Development Survey 2005/06 and 2006/07.

FIGURE 6:
Women researchers as a percentage of total researchers (headcount) per sector (South Africa, 2006)

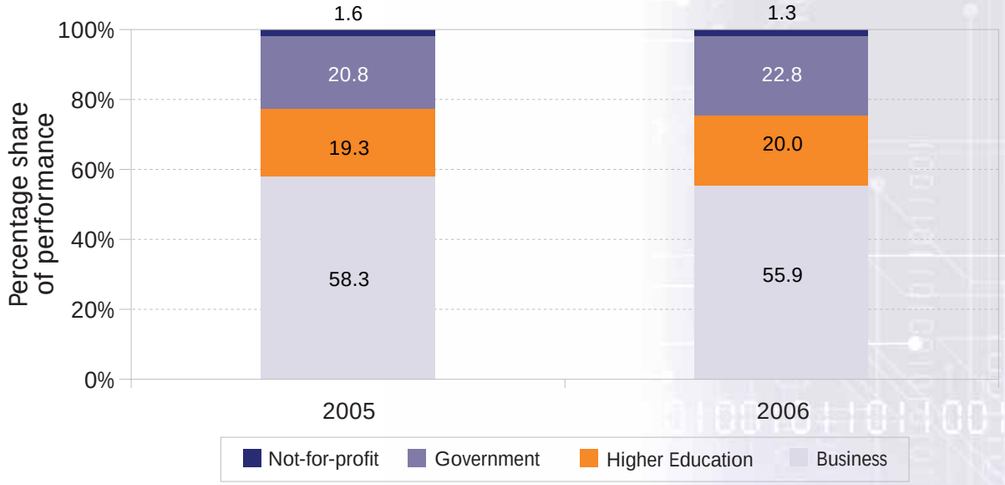


For the 2006/07 period the business sector accounted for 55.9% of R&D performance in South Africa, followed by the government sector (22.8%). The government sector (including the science councils) recorded a greater expenditure than the higher education sector and increased its expenditure from 20.8% of the total to 22.8%. The higher education sector also increased R&D expenditure from 19.3% to 20.0% while the not-for-profit sector's share shrank slightly from 1.6% of the total to 1.3%. All other sectors did however indicate an increase in R&D expenditure as is evident from the accompanying table.

SOURCE: South African National Research and Experimental Development Survey 2005/06 and 2006/07.

R&D Expenditure (R 000s)	Business	Higher Education	Government	Not-for-Profit	Total
2005	8 243 776	2 732 215	2 946 734	226 514	14 149 239
2006	9 243 165	3 298 808	3 766 073	212 538	16 520 584

FIGURE 7:
Performance of R&D by Sector
(South Africa, 2005 & 2006)

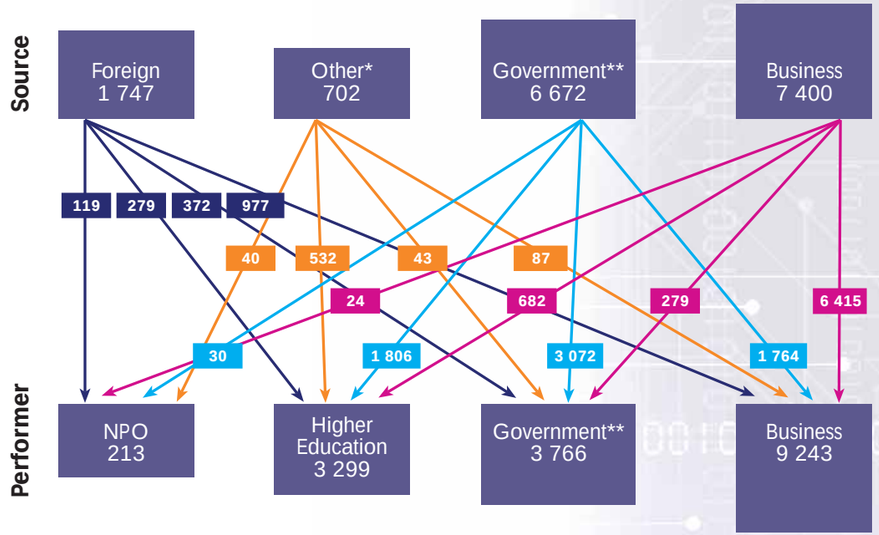


The business sector continues to be the largest performer of R&D, spending about R9.2 billion. Government follows at R3.8 billion and higher education at R3.3 billion. The bulk of R&D expenditure is funded from business sector sources (44.8%). Government funding of R&D has increased from R5.4 billion in 2005 to R6.7 billion in 2006 meaning that government's share of funding has increased from 38.2% to 40.4%. However, government performance of R&D has increased from 20.8% in 2005 to 22.8% in 2006. Foreign funding of R&D has decreased from R1.92 billion (or 13.6%) in 2005 to R1.75 billion (or 10.6%) in 2006.

SOURCE: South African National Research and Experimental Development Survey 2005/06 and 2006/07.

* Other includes contributions from Higher Education, Not-for-profit organisations and individual donations
** Government includes Science Councils

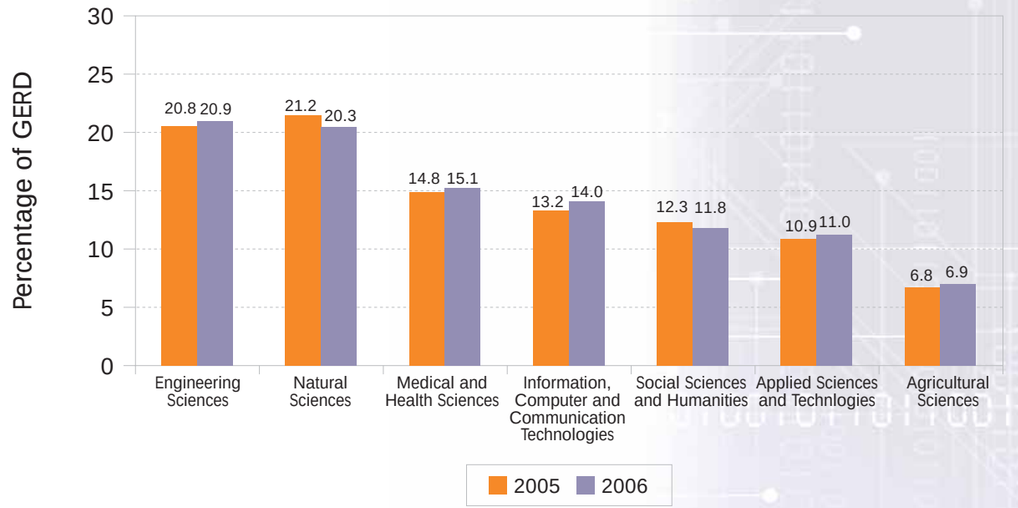
FIGURE 8:
Major flows of funding for R&D, 2006/07 (R millions)



The distribution of R&D expenditure by major research fields for 2006 is much the same as that of 2005 but the engineering sciences is now the largest field and accounts for 20.9% of R&D expenditure, overtaking the natural sciences at 20.3%. The medical and health sciences have gown slightly from 14.8% to 15.1%. The social sciences and humanities accounted for 12.3% of R&D expenditure in 2005 but have dropped slightly to 11.8%. The applied sciences and technologies accounted for 11.0% of expenditure and agricultural sciences for 6.9% of R&D expenditure.

SOURCE: South African National Research and Experimental Development Surveys 2005/06 and 2006/07

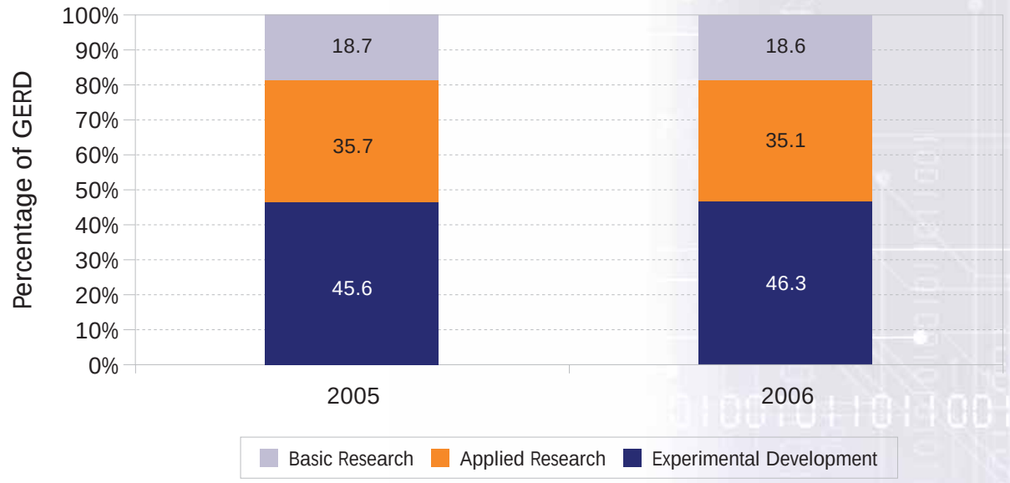
FIGURE 9:
Expenditure on R&D by major research field (South Africa, 2005 & 2006)



In 2006 the major share of R&D expenditure was devoted to experimental development (46.3%). This was followed by 35.1% of R&D expenditure for performance of applied research and 18.6% of R&D expenditure spent on basic research. Experimental development has increased slightly from 45.6% in 2005 to 46.3% in 2006

SOURCE: South African National Research and Experimental Development Surveys 2005/06 and 2006/07

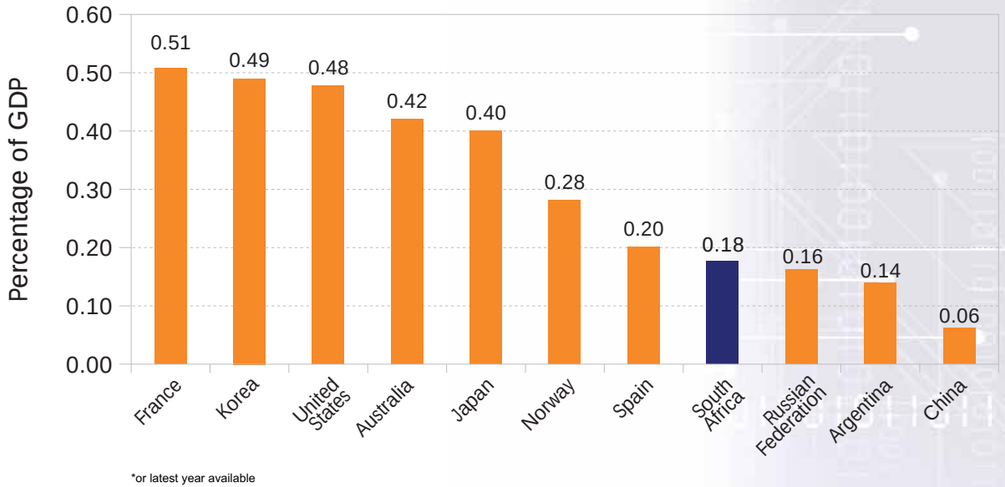
FIGURE 10:
Gross expenditure on R&D by type of research (South Africa, 2005 & 2006)



Basic research expenditure (as a percentage of GDP) is an important indicator of a country's R&D capacity to adapt to new challenges and produce new knowledge. South Africa's expenditure on basic research of 0.18% of GDP is slightly up from the 0.17% recorded in 2005. Most countries reflected in the graph have had a relatively stable percentage of GDP devoted to basic research over the past few years.

SOURCE: International comparisons – OECD Main Science and Technology Indicators, (2008/1 Edition)

FIGURE 11:
Basic research as a percentage of GDP 2006*
(International comparison)



*or latest year available