

Research performance of Australian universities

Key points

Go8 universities account for over two-thirds of the research undertaken at Australian universities. Go8 universities attract the highest levels of industry and competitive government grant funding for research.

While the absolute amount of higher education research funding has grown significantly, the relative shares of research income (as reported in the Higher Education Research data Collection) and research block grant funding of the major university groupings in Australia has been largely unchanged over the period 1992 to 2010 and 2002 to 2012 respectively with most redistribution of shares occurring between non-Go8 institutions.

The National Survey of Research Commercialisation showed that in 2009 Go8 universities dominated in the number of invention disclosures and active licensing agreements as well as in licensing income and the number of patents issued.

Based on the Excellence in Research for Australia (ERA) 2010 outcomes, research of the highest quality (ie research well above world average and rated 5) is predominately undertaken at Go8 universities.

The Federal Government has allocated \$65.7 m of Sustainable Research Excellence (SRE) funding on the basis of ERA outcomes from 2012, the only component (4%) of the \$1,632 m in research block grants which is allocated directly on the basis of research excellence.

Government policy should focus on selectivity and concentration of the higher education research effort with the aim of ensuring that funds flow to the best research wherever it may be and that Australia's research universities can sustain international research excellence.

ERA outcomes should continue to apply to the allocation of SRE funding and also be used to allocate Research Training Scheme (RTS) funding.

Introduction

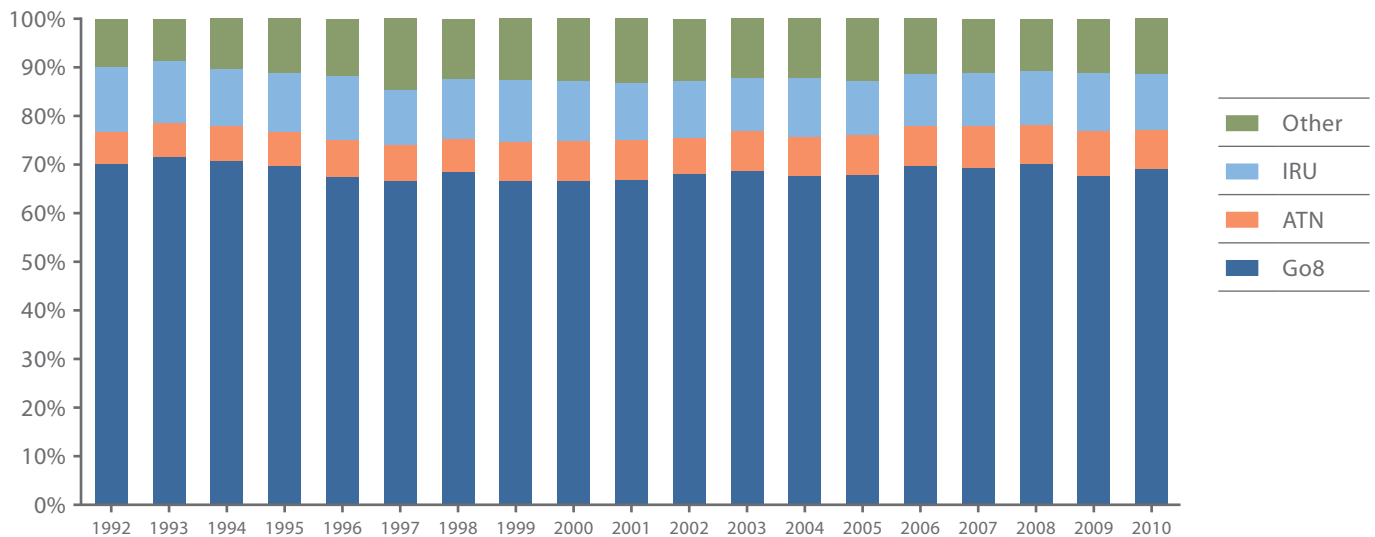
This paper presents an analysis of trends in research performance for Go8 and non-Go8 universities including research income as reported by institutions to the Department of Innovation, Industry, Science, Research and Tertiary Education (DIISRTE) as part of the Higher Education Research Data Collection (HERDC) and the DIISRTE Research Block Grant Allocations as well as ERA outcomes and commercialisation data from the National Survey of Research Commercialisation.

This analysis compares Australian universities within the Australian context and does not comment on their ability to compete internationally. Australia's research universities need to be competitive on a global scale to ensure their global reputations, their ability to attract the best researchers, staff and students and to ensure Australia's economic growth. In the international sphere, many countries are deciding to concentrate their research capacity investments in a few universities able to play on the world stage at the cutting edge of research, for example, Germany, France, Singapore, China and South Korea. Australia has favoured selectivity over concentration. To what extent are Australian taxpayers obtaining returns on their investment in university research when the Government has no clear policy for strengthening Australia's elite performers in the intensifying international competition?

Research performance

External Research Income

Figure 1. HERDC income, 1992-2010 (percentage)



Australian universities received \$3,073 million in external research income in 2010 as reported in the DIISRTE Higher Education Research Data Collection (HERDC). This income includes income from competitive grants, other Government sources, industry and foundations and international income. (Universities also received income from DIISRTE research block grants, infrastructure funding and funding for research student scholarships which are not reported as part of the HERDC.) Of the HERDC income Go8 universities received \$2,119 million (69.0%) while the seven IRU universities \$346 m (11.3%) and the five ATN universities received \$255 m (8.3%) respectively.

Interestingly, the share of HERDC income received by the Go8 institutions has changed relatively little from 1992 to 2010 as shown at Figure 1. In 1992 the Go8 institutions received 69.9% of total income reported though HERDC while the IRU institutions received 13.2% and the ATN institutions 6.8%. Note that some of the changes in universities' shares during the period will be due to the changes in the HERDC definitions including, for example, the treatment of syndicated R&D, Cooperative Research Centres (CRCs) and joint ventures as well as eligibility changes and changes to the Australian Competitive Grants Register (ACGR).

Looking more closely at recent trends, Figure 2 shows HERDC total income from 2002 to 2010 for the major university groupings. All groups gained in absolute terms. Figure 3 shows the percentage share of income by each of the major university groupings. Over the period 2002-2010, the Go8 universities increased their share of HERDC income from 67.8% to 69.0% while the IRU universities have declined from 11.6% to 11.3% and the ATN universities have moved from 7.7% to 8.3%. This flatness in research income challenges strongly the claims of newer universities regarding their potential to improve their relative performance. After two decades there are no apparent breakthroughs on the part of the newer universities yet it seems that Australia's leaders are being held back through the levelling-down of public policy post 1987.

Figure 2. HERDC total income, 2002-2010

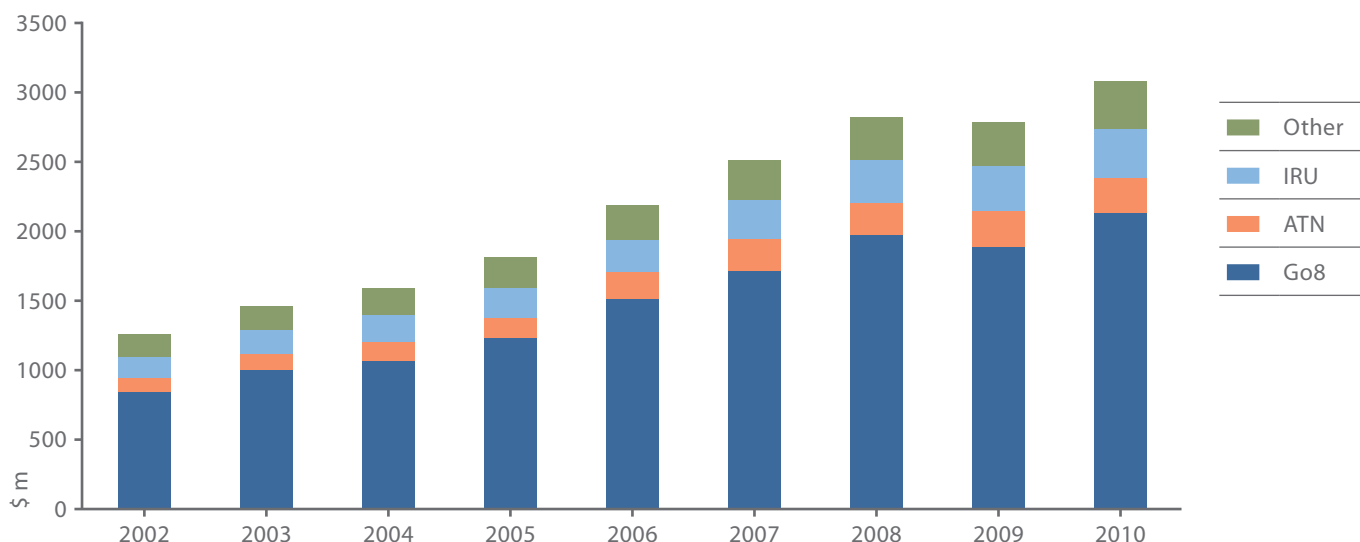
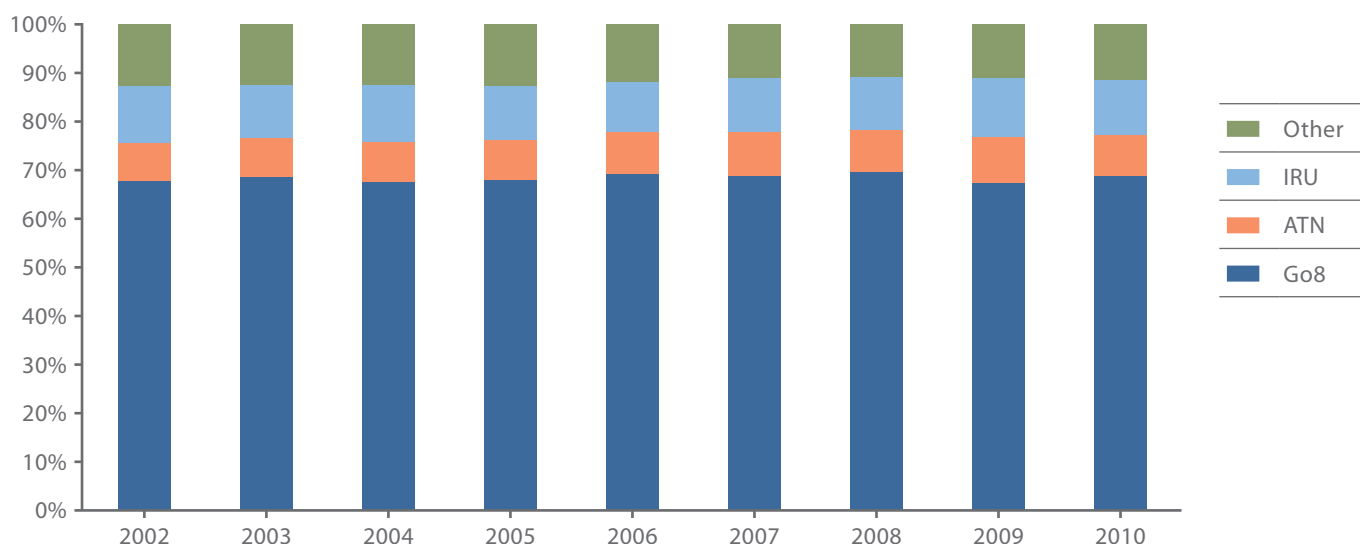


Figure 3. HERDC total income (percentage)



Similar trends are found with income from Australian Competitive Grants (ACGs) over the period 1992 to 2010. ACGs are grants from specified funding agencies and schemes which DIISRTE considers are allocated through a nationally competitive (usually peer-reviewed) process. The funding agencies include the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC) as well as other Commonwealth agencies such as many of the primary industry R&D Corporations and some non-Government funding agencies such as medical foundations. The inclusion of the NHMRC and medical foundations in the ACGR favours universities with funding via medical schools.

Income from ACGs in 2010 amounted to \$1,313 m of which Go8 universities received \$972.9 m (74.1%), the IRU universities \$135.5 m (10.3%) and the ATN universities \$78.4 m (6.0%). This compares (Figure 4) with \$196.6 m (70.0%) for the Go8 institutions in 1992, \$39.3 m (14.0%) for the IRU institutions, and \$15.3 m (5.4%) for the ATN institutions.

Figure 4. ACG income, 1992-2010

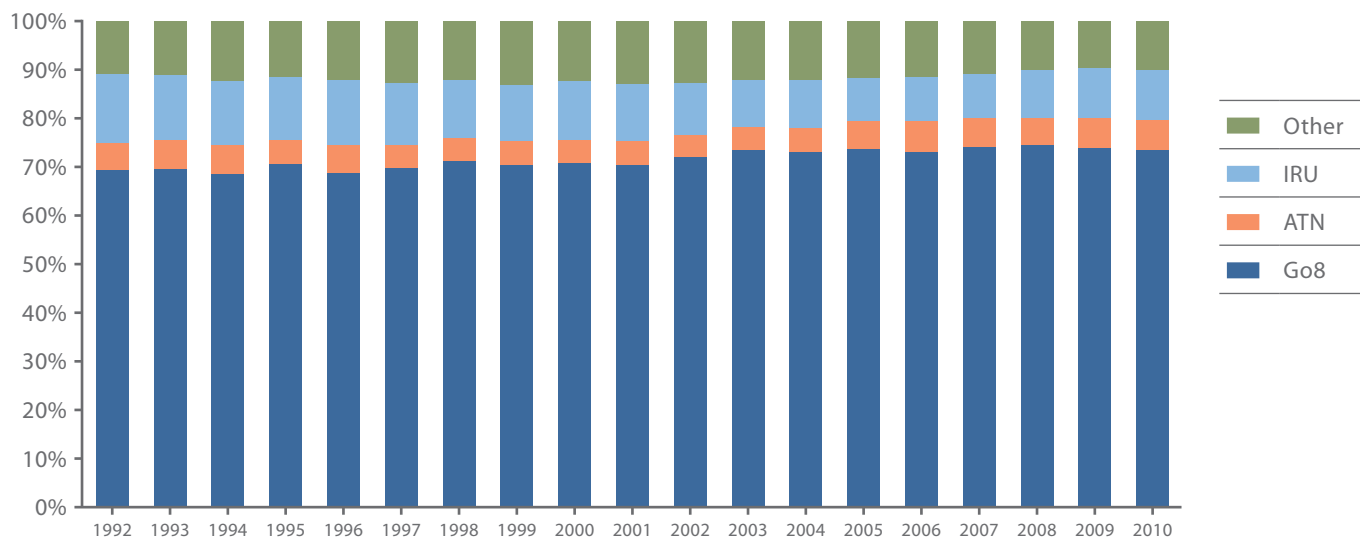


Figure 5. ACG income, 2002-2010

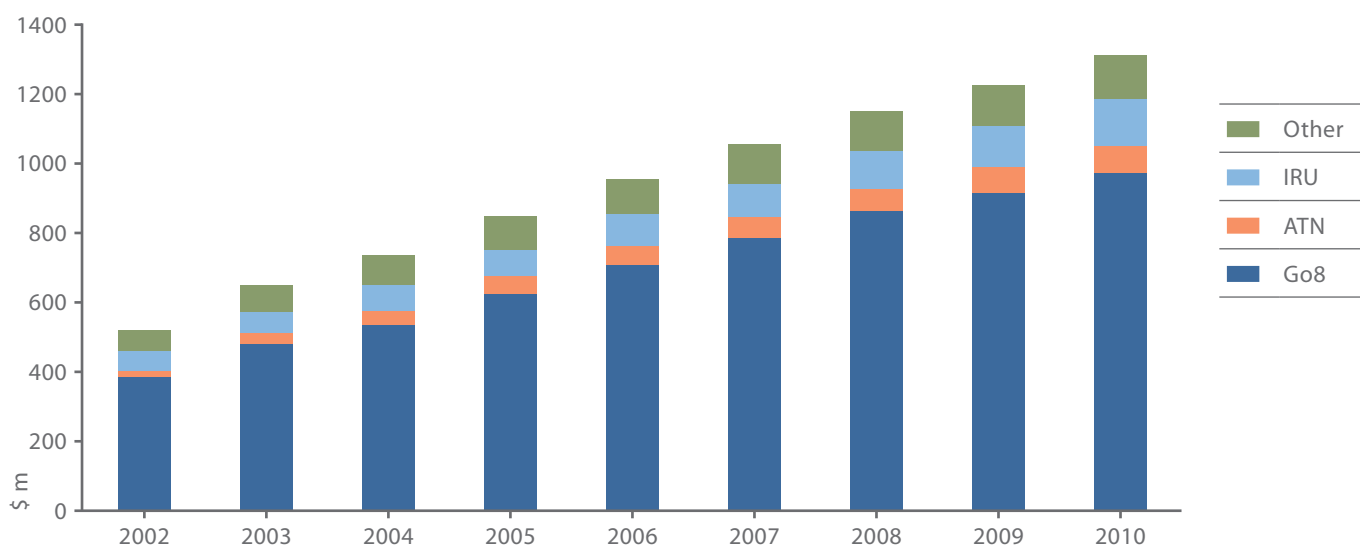


Figure 5 shows the breakdown of ACG income from 2002 to 2010 by major university grouping while Figure 6 shows their respective percentage shares. (In 2002 the Institute of Advance Studies (IAS) at the Australian National University (ANU) became eligible for the major ARC and NHMRC funding schemes). Over the period 2002 to 2010, the Go8 share of ACG income rose from 72.7% to 74.1% while the IRU universities share fell from 10.8% to 10.3% and the ATN share grew from 4.3% to 6.0%. The ATN universities have increased their share during this period, apparently at the expense of the 'other' universities.

Figure 6. ACG income, 2002-2010 (percentage)

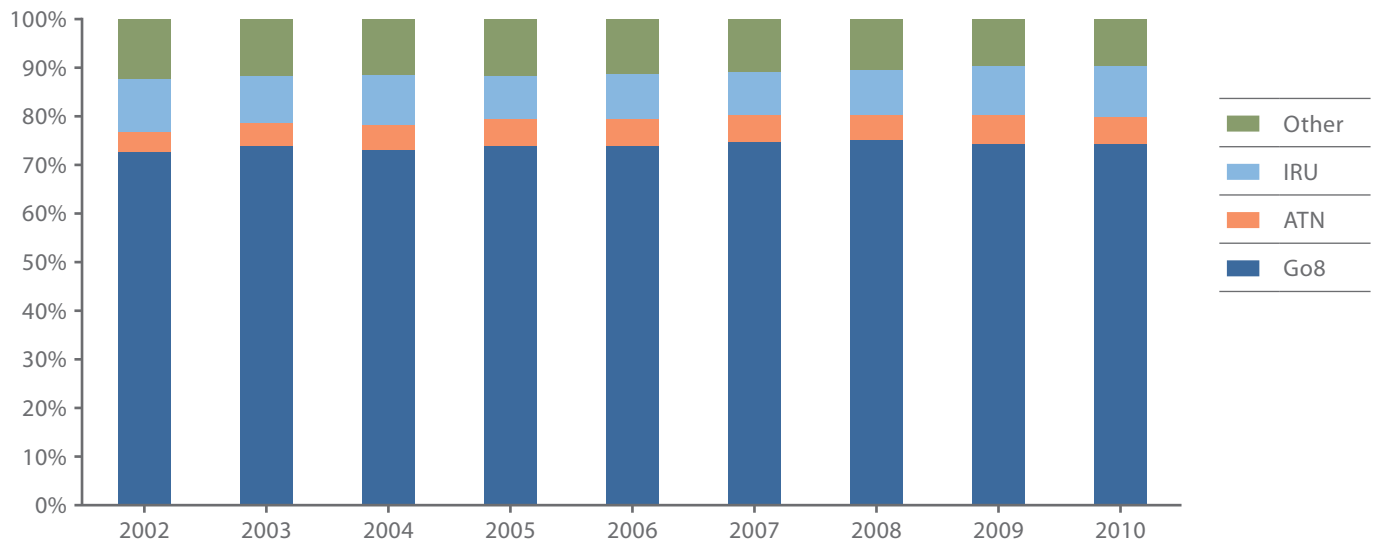


Figure 7 shows HERDC income from Other Government sources over the period 1992 to 2010. (Other Government sources include income from Australian Commonwealth, State and Local governments which is not included in ACG income or income associated with Cooperative Research Centres, CRCs). The Go8 share of this income has risen from 54.8% in 1992 to 67.2% in 2010 while the IRU share has fallen from 14.6% to 12.9% and the ATN share has dropped from 13.2% to 9.7%.

In 2010, Go8 institutions received \$566.9 m (67.2%) in research income from other Government sources, the IRU universities \$109.1 m (12.9%) and the ATN universities \$81.6 m (9.7%). Figures 8 and 9 show the change in this income over the period 2002-2010 (major changes to the HERDC rules about joint ventures were made in 2009). The Go8 income from other Government sources in 2002 was \$126.9 m (55.9%) while the IRU universities received \$27.8 m (12.2%) and the ATN universities \$32.1 m (14.1%).

Figure 7. HERDC other public sector income, 1992-2010 (percentage)

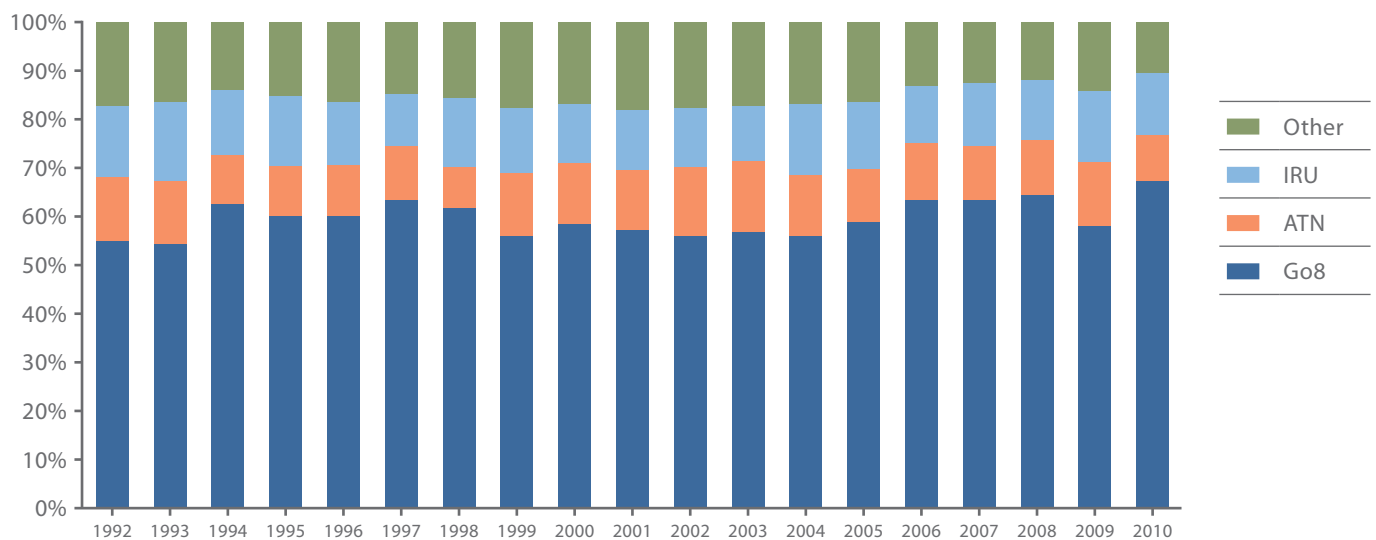


Figure 8. HERDC other public sector income, 2002-2010

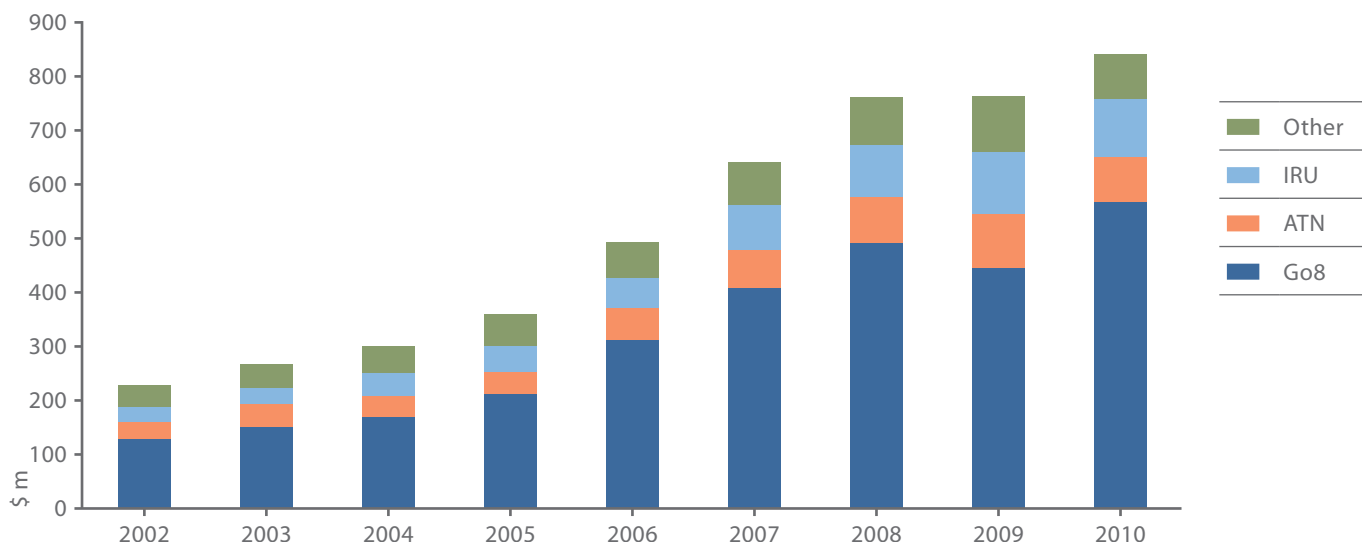


Figure 9. HERDC other public sector income, 2002-2010 (percentage)

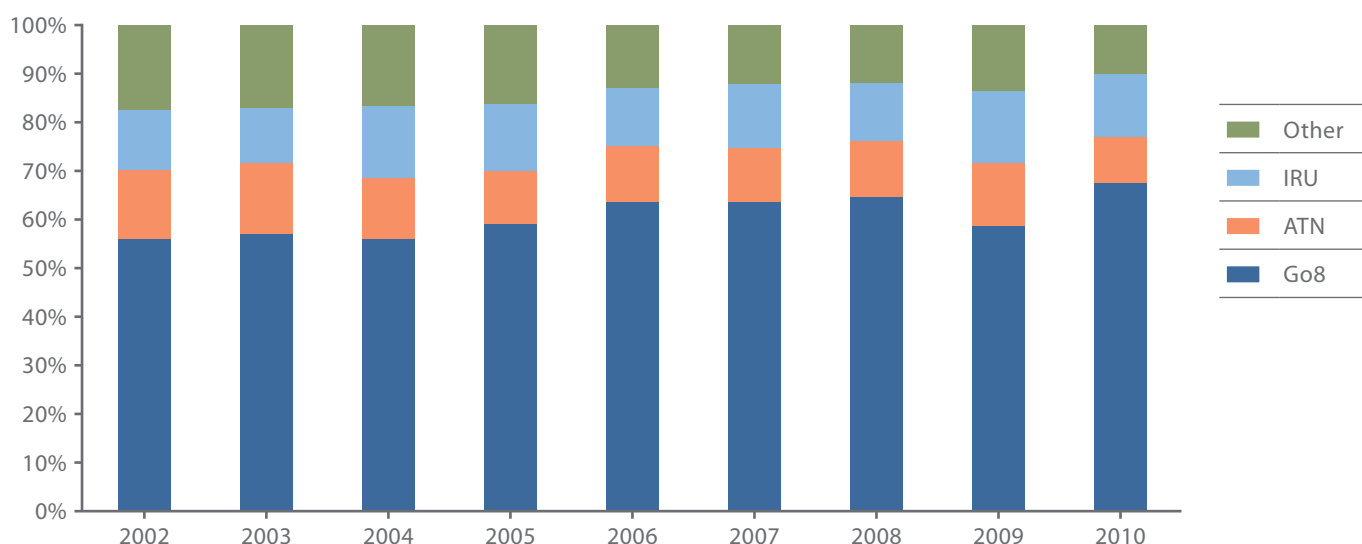


Figure 10 shows HERDC Industry and Other income over the period 1992-2010. (Industry and Other includes income from Australian industry and private non-profit sources including donations and bequests as well as international income from all sources.) The Go8 universities share of this income has changed from 71.3% in 1992 to 67.1% in 2010, the IRU universities share has increased from 10.3% to 11.0% and the ATN universities share has increased from 6.2% to 8.8%.

Within the 'industry and other' category, are categories covering grants and contracts from Australian sources (excluding income from foundations). In 2010, of the income reported in HERDC from Australian grants and contracts from non-Government sources, the Go8 received \$213.8 m (61.0%), the IRU universities \$49.2 m (14.0%) and the ATN universities \$47.6 m (13.6%). Figures 11 and 12 show the income from these sources over the period 2002-2010. Over this period the Go8 share has remained relatively stable (60.5% in 2002 and 61.0% in 2010) while the IRU has decreased from 15.8% in 2002 to 14.0% in 2010 and the ATN share has increased from 10.8% to 13.6%.

Figure 10. HERDC industry and other funding, 1992-2010 (percentage)

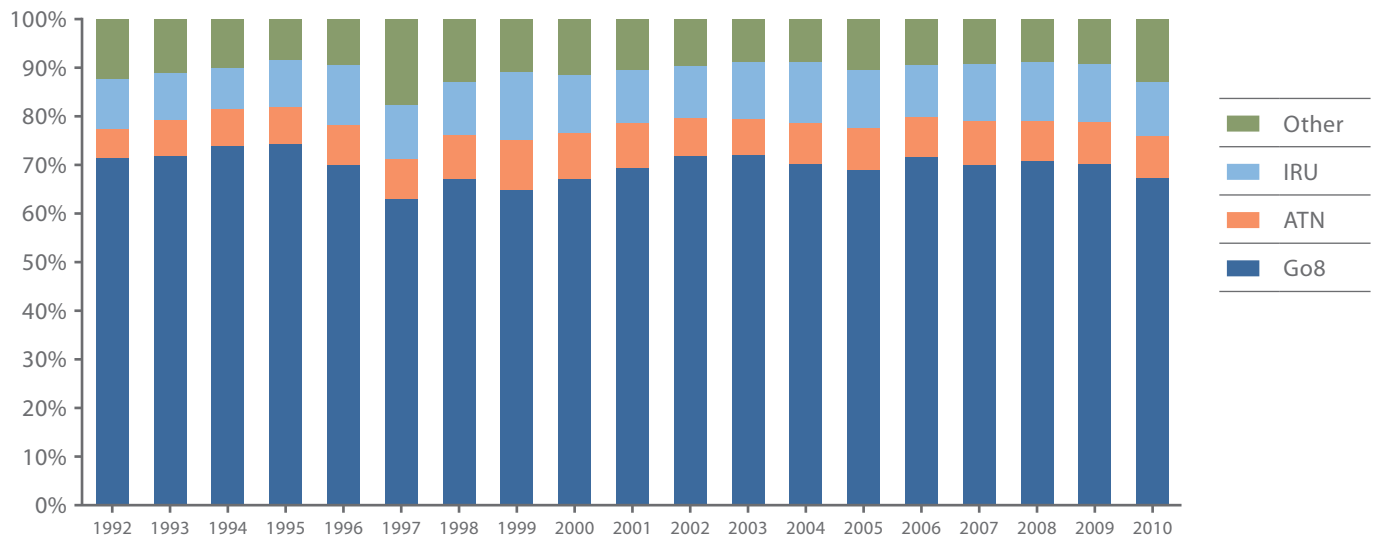


Figure 11. HERDC Australian non-government grants and contracts, 2002-2010

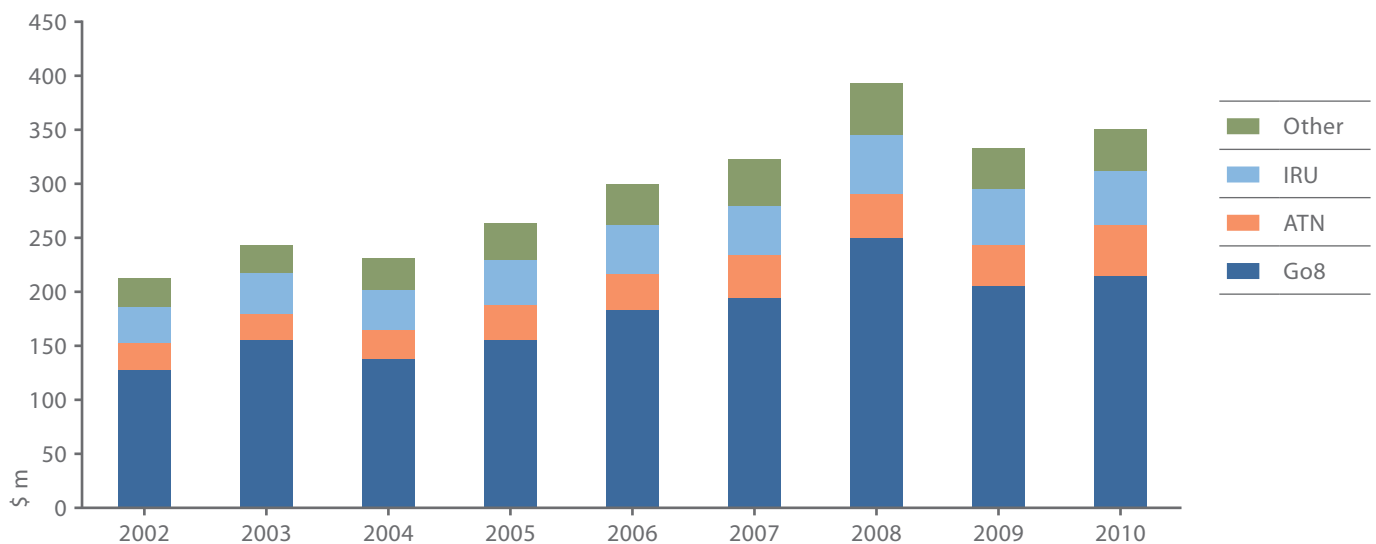
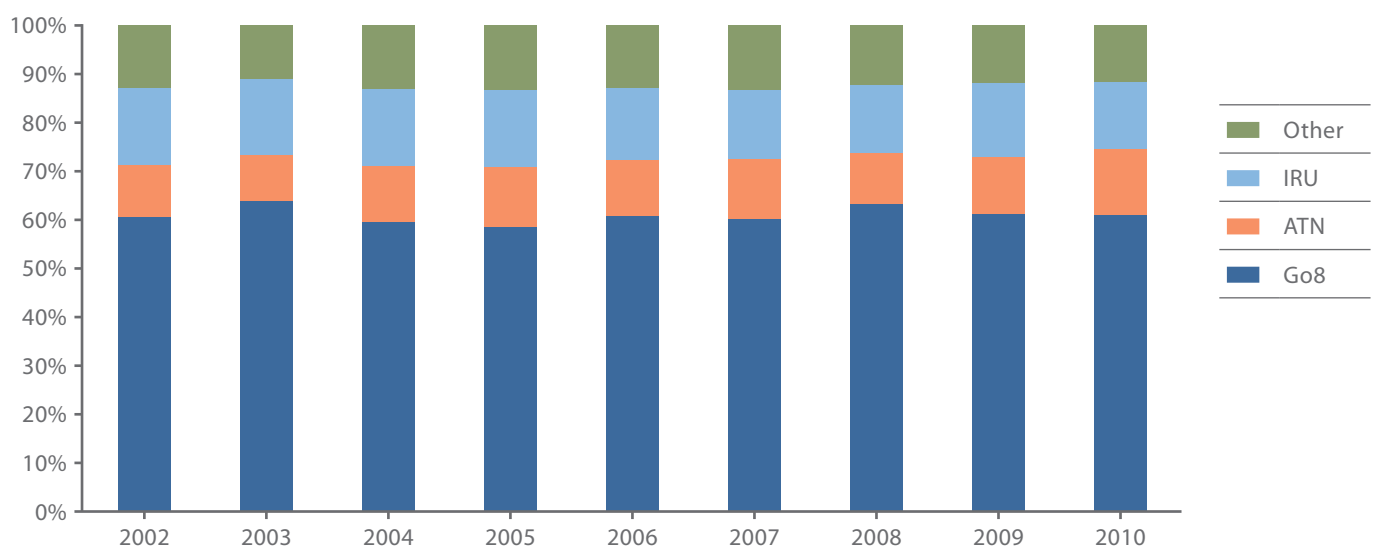


Figure 12. HERDC Australian non-government grants and contracts, 2002-2010 (percentage)



For the remaining components of HERDC 'Industry and other' income and income associated with CRCs, in 2010:

- Go8 institutions received \$190.2 m in funding from international sources (68.5%), IRU universities \$23.1 m (8.3%) and ATN universities \$19.0 m (6.8%).
- Go8 institutions received \$130.6 m in funding from donations, bequests and foundations (77.6%), the IRU universities \$15.4 m (9.1%) and the ATN universities \$3.5 m (2.1%).
- Go8 institutions received \$45.4 m in funding associated with CRCs (38.1%), the IRU universities \$13.6 m (11.5%) and the ATN universities \$25.3 m (21.3%).

Research Block Grants

DIISRTE provides research block grant programs through a range of programs including the Research Infrastructure Block Grants (RIBG), Joint Research Engagement (JRE), Sustainable Research Excellence (SRE), Research Training Scheme (RTS) and the Australian Postgraduate Awards (APAs).

Figures 13-14 show the allocation of DIISRTE research block grants over the period of 2002-2012 broken down by university grouping. (2002 marked the establishment of the Institutional Grants Scheme and the first competitive year of RTS funding. The IAS also became eligible for block grant funding in 2002.)

Figure 13. Research Block Grants, 2002-2012

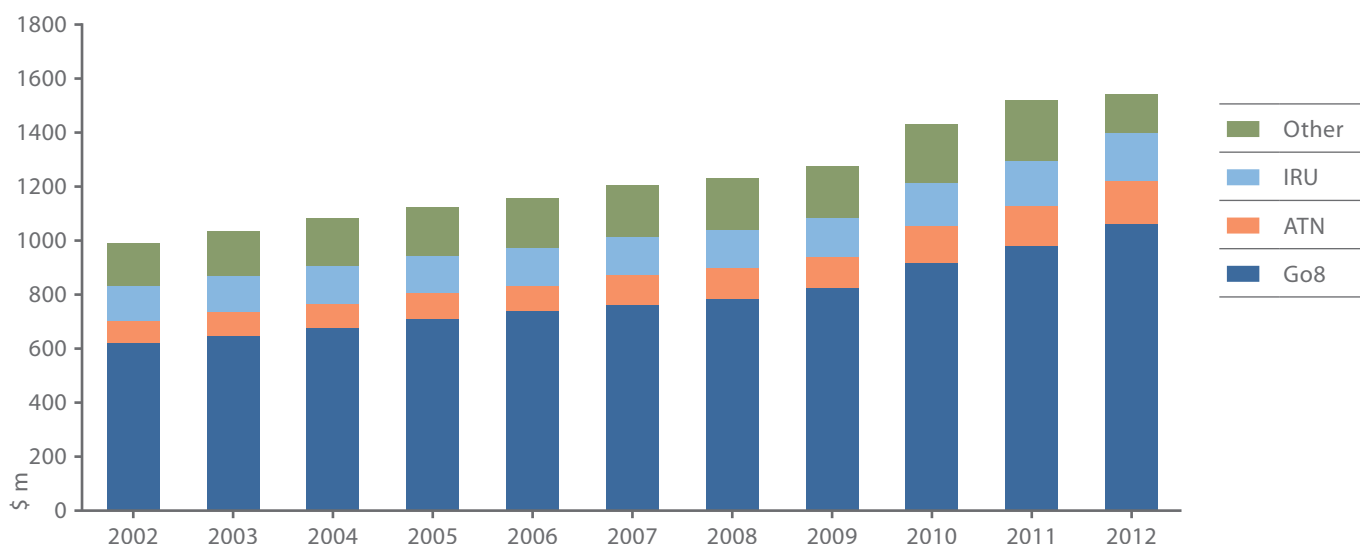
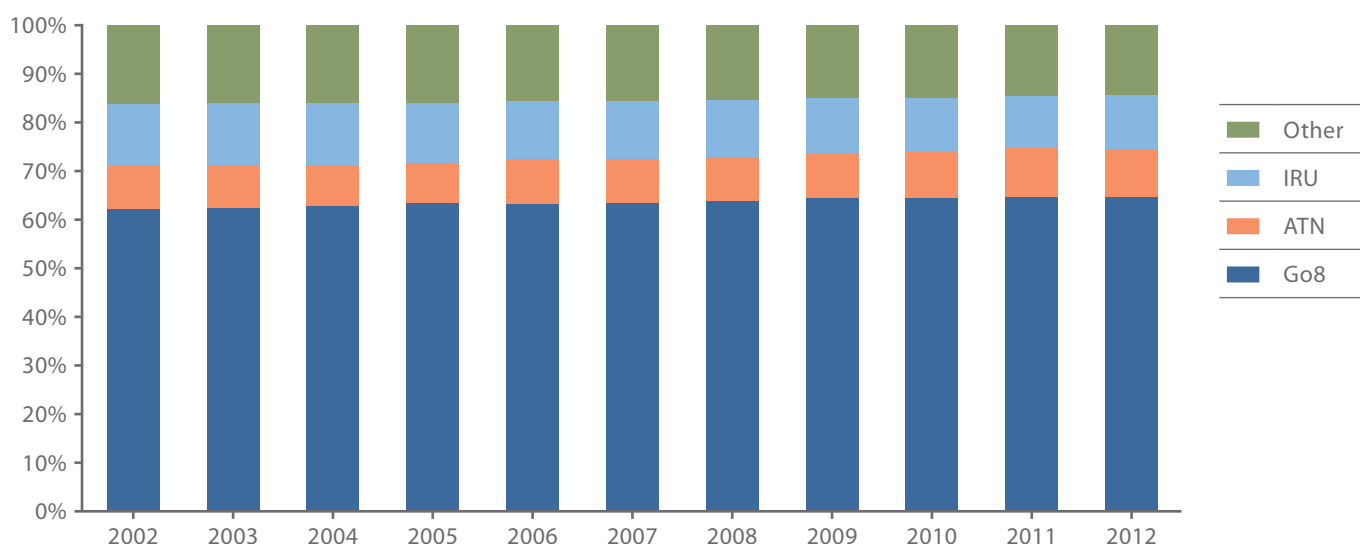


Figure 14. Research Block Grants, 2002-2012 (percentage)



In 2012 the Go8 institutions received \$1057.1 m (64.8%) in research block grant funding from DIISRTE. The IRU universities received \$177.6 m (10.9%) and the ATN universities \$158.8 m (9.7%). As Figure 14 shows there has been relatively little movement in the respective shares of block grants with the Go8 share increasing from 62.4% in 2002 to 64.8% in 2012, the IRU share decreasing from 13.0% to 10.9% and the ATN share increasing from 8.5% to 9.7%.

For RTS funding (Figures 15-16), the Go8 share has risen from 59.7% in 2002 to 62.2% in 2012, the IRU share has fallen from 13.1% to 10.9% while the ATN share has increased from 9.5% to 10.8%.

Figure 15. RTS funding, 2002-2012

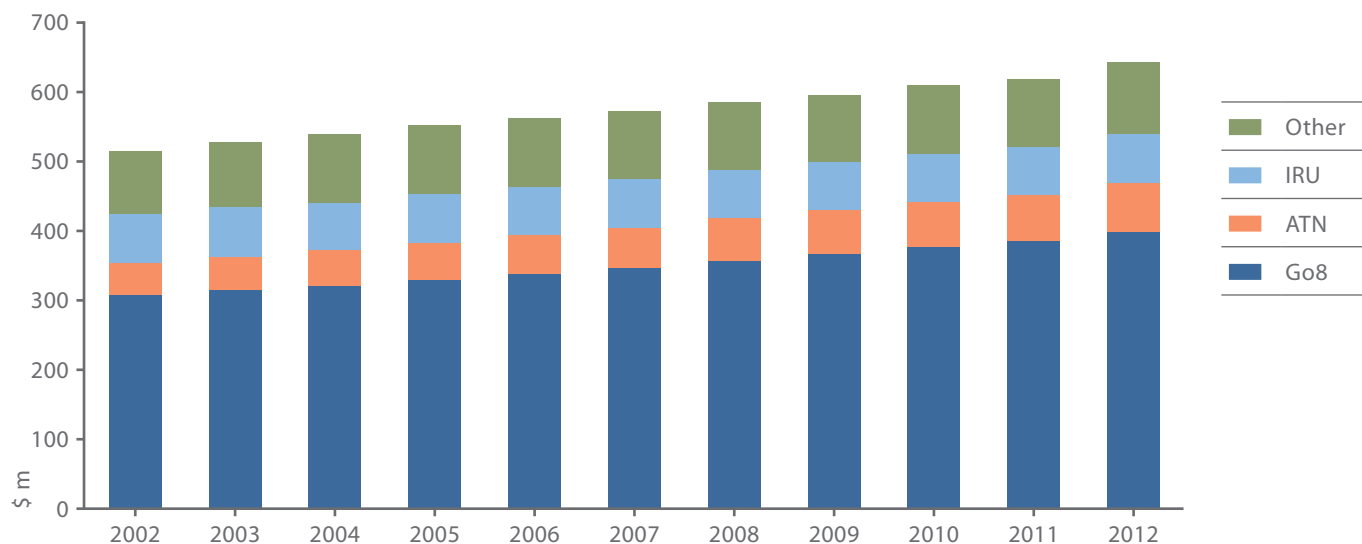
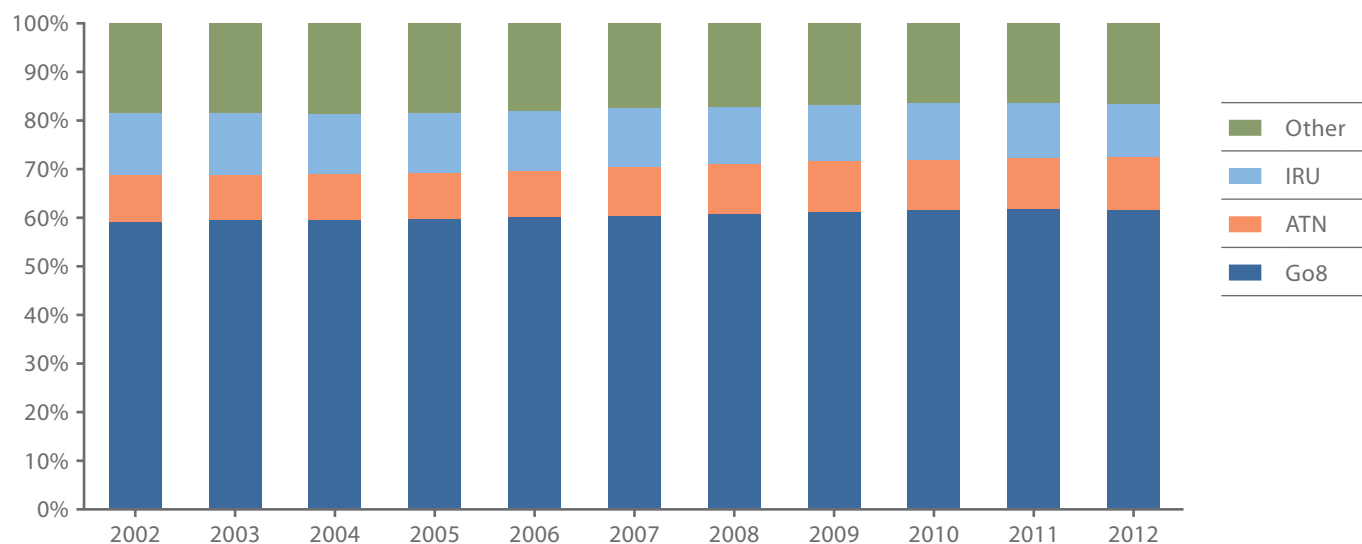


Figure 16. RTS funding, 2002-2012 (percentage)



ERA Outcomes

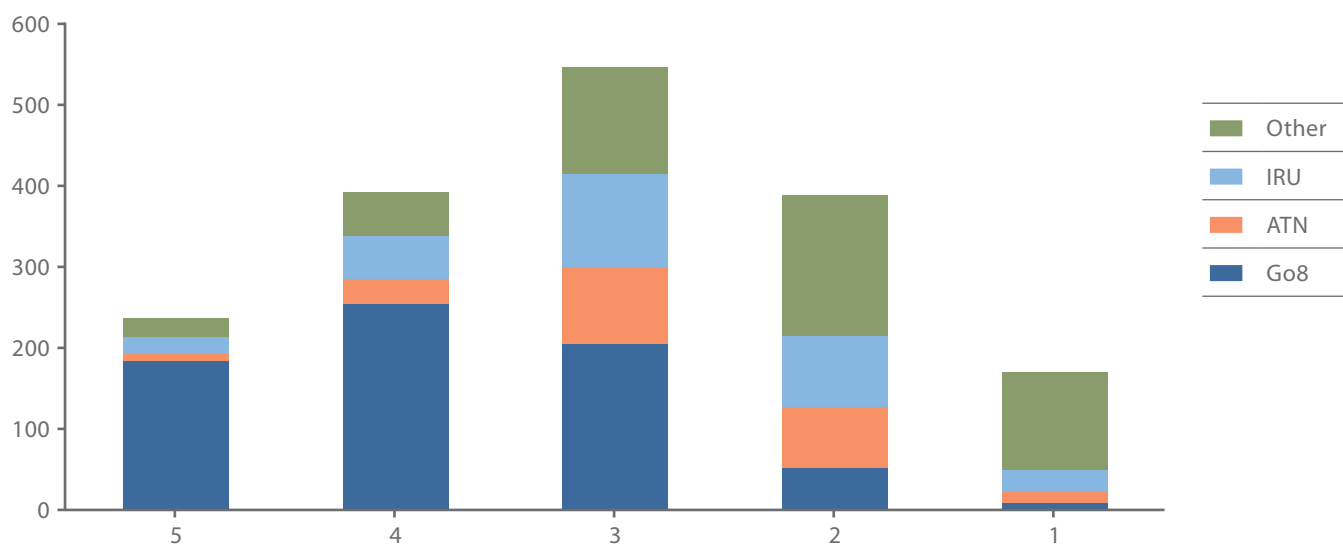
The Excellence in Research for Australia (ERA) initiative assesses research quality within Australia's higher education institutions using a combination of indicators and expert review by committees comprising experienced, internationally-recognised experts. ERA undertook an assessment of research areas as defined by the Australian Bureau of Statistics Field of Research Classification. ERA ranked research areas as 5 (well above world standard), 4 (above world standard), 3 (at world standard), 2 and 1 (below and well below world standard respectively).

Figure 17 shows the number of research areas (based on 4 digit Fields of Research (FoR) codes) for each ERA ranking by university grouping for ERA 2010 (note that this provides no measure of the size of the effort in each research area or of the volume of outputs).

In ERA 2010, 90.9% of the assessed research areas from Go8 institutions were rated world average (3) or above, 62% rated above world average (4) or above and 26% rated well above world average (5). By contrast the IRU universities had 61.9% of their assessed research areas rated 3 or above, 18.8% rated 4 or above and 6.7% rated 5 and the ATN universities had 60.9% of their assessed research areas rated 3 or above, 18.2% rated 4 or above and 4% rated 5.

The Go8 universities had 77% of the total research fields assessed across the university sector as well above world average (5) and 69.3% of the total assessed as above world average (5 or 4). The IRU universities had 8.4% of the total fields assessed as well above world average (5) and 11.4% of the fields assessed as above world average or higher (4 or 5) while the ATN universities had 3.8% and 6.5% respectively. Some individual institutions that are not part of these university groupings also have individual research strengths, for example, Macquarie University, University of Tasmania and Deakin University. This qualitative difference between Go8 universities and the other universities leads to the question of the extent to which taxpayers funds are well spent by the Government's continued investment in research in many other institutions.

Figure 17. ERA rankings by number of assessed 4 digit FoRs

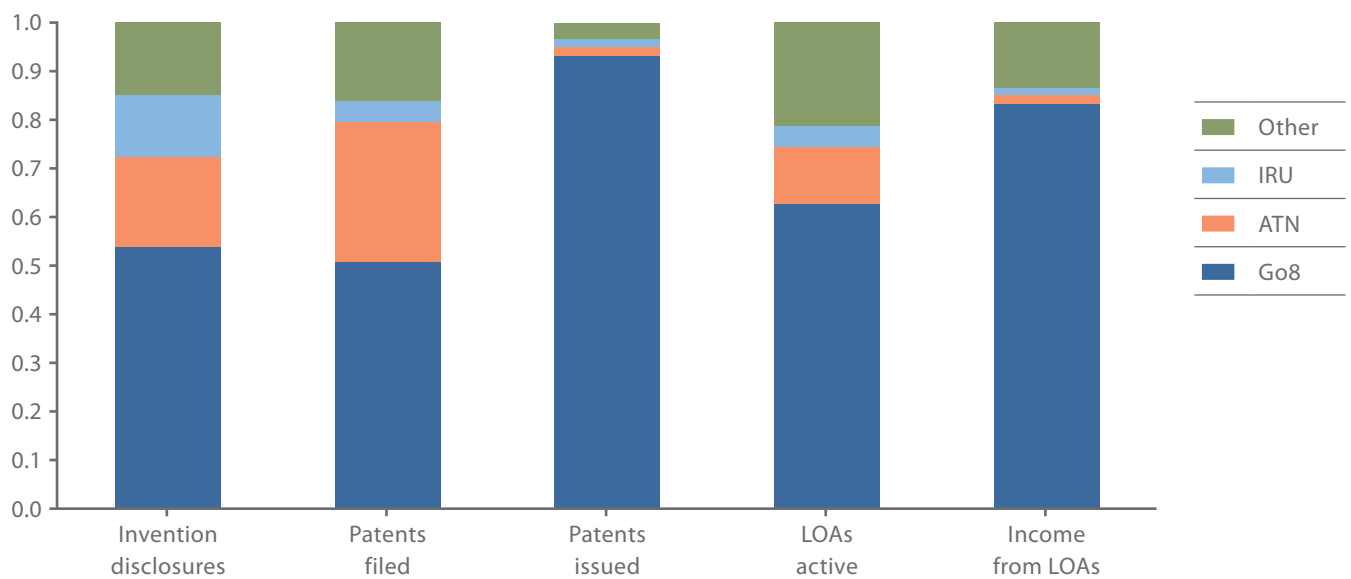


Commercialisation

The National Survey of Research Commercialisation (NSRC) is a survey of research commercialisation inputs, activity and outputs for Australian publicly funded research organisations (Universities, Publicly Funded Research Agencies and a range of Medical Research Institutes) undertaken every two years.

The survey released in 2011 showed that in 2009 the Go8 universities had 645 invention disclosures (53.8% of the total reported in the university sector) while the IRU universities had 157 (13.1%) and the ATN universities 219 (18.3%). Go8 institutions had 582 active licensing agreements (62.2% of the total for the university sector) while the IRU universities had 42 (4.55%) and the ATN universities 111 (11.9%). Go8 universities had 558 patents issued (92.8%) of the total reported in the university sector) while the IRU universities had 9 (1.5%) and the ATN universities 13 (2.2%).

Figure 18. Commercialisation survey 2009



Conclusion

Since the early 1990s there has been an overall lack of a clear and cohesive funding policy for university research. Unless Australia can sustain research excellence there will be a decline in Australia's research performance at the international level. This could well lead to an erosion in the reputation of Australian universities and a consequential decline in Australia's ability to attract the best researchers and research students, and be detrimental to Australia's economic competitiveness.

Selectivity (supporting the best wherever they are found) and concentration (targeted funding to strengthen capability at internationally competitive standards) are dual principles to guide the funding of higher education research in Australia. However, the course of policy development until recently has been driven by selectivity alone.

This analysis shows clearly that while the absolute amount of funding has grown significantly over the period 2002 to 2010, the relative shares of HERDC research income and research block grant funding of the major university groupings in Australia has been largely unchanged over the period 1992 to 2010 and 2002 to 2012 respectively.

Around the world, there is a growing concentration of investment in world-class research universities. The higher education research system is a critical contributor to economic development and plays an important role in innovation and creation of new knowledge. Given the rising skills and innovation demands of the knowledge economy, the performance of universities is becoming even more important for future economic development.

An internationally competitive higher education research system is important in establishing international research networks and enabling Australia to participate as a key player at the 'cutting-edge' of science and research, in knowledge formation and transfer at the most elite level.

The focus of the Government's policy needs to be on selectivity *and* concentration of university research funding. Australia needs a coherent research funding structure which seeks to do two things: (i) selectively fund research of the highest quality wherever it may be found and (ii) concentrate research funding to build world-class research universities which have the capacity to compete at the highest international level.

Given the increasing importance of international research collaboration, concentration will help in ensuring that Australia's university researchers are supported at a level that will enable them to compete globally and to be players in international collaborations at the research forefront.

The Government has taken one step in this direction with a small component of the research block grants, \$65.7 m of SRE Threshold 2 funding, being allocated on the basis of ERA outcomes from 2012, the only component of the \$1,632 m in research block grants which is allocated directly on the basis of research excellence.

To ensure the best returns on taxpayer's funds and rise above a culture of mediocrity, the Government needs to extend the use of ERA outcomes to the allocation of additional SRE funding and use ERA outcomes to allocate RTS funding as a means of driving the selectivity and concentration of Australia's higher education research system. Allocating RTS funding based on excellence will help ensure that funding for training research students is focused on institutions which provide the best research environment and which will enable research students to undertake cutting-edge research and participate in collaboration with the best research groups internationally.

Sources

DIISRTE Higher Education Research Data Collection 1992-2010

DIISRTE Research Block Grant Allocations 2002-2012

ARC Excellence in Research for Australia 2010

Shanghai Jiao Tong World University Rankings 2011

National Survey of Research Commercialisation 2009 (released 2011)