

AN OVERVIEW

Total research income in public tertiary education institutions rose in 2005. The largest source of research income for tertiary education institutions was research contracts, followed by enrolments-based research top-ups, the Performance-Based Research Fund and funding for centres of research excellence.

Government funding for research via Vote Education rose in 2005. The funding distributed through enrolments-based research top-ups fell, as funding for this source was progressively transferred to the Performance-Based Research Fund.

Research contract income in the universities increased in 2005, although it fell slightly as a percentage of total university revenue. Information on the two components that comprise contract income is not available for 2005. However, research contract funding won by the universities from government contestable research funds distributed via Vote Research, Science and Technology increased in 2004. Research contract income earned from 'other' sources also increased in 2004. The universities also increased their share of the funding from Vote Research, Science and Technology in 2004, for the second consecutive year.

LOOKING TO 2006

The three-year phase-in period of the Performance-Based Research Fund continued in 2006 with 50 percent of research top-ups funding transferred to the fund, up from 10 percent in 2004 and 20 percent in 2005. The estimated size of the fund in 2006 is \$112.1 million, up from \$38.7 million in 2005 and \$16.1 million in 2004. These figures exclude goods and services tax.

In 2006, the government announced that additional funding will be placed into the Performance-Based Research Fund contestable pool and this will take the total size of the fund to an estimated \$226 million in 2009/10. The government also announced additional funding for the centres of research excellence. There will be extra operational funding of \$10 million from 2007/08 along with a one-off capital funding injection of \$20 million. This funding is targeted at the existing centres but will also allow for the establishment of up to two new centres of research excellence. In addition, the government approved \$40 million of capital funding, over five years, for the partnerships for excellence initiatives.

SOURCES OF RESEARCH REVENUE

Tertiary education organisations in New Zealand fund their research activities from a variety of sources. Part of this funding is provided by the government and recognises the costs of research activities. In addition, many tertiary education organisations are active in seeking external funding for their research work, through winning research contracts and grants. Part of that research contract and grant funding is provided by the government through its funding for the national research, science and technology effort.

This chapter looks at the revenue generated by tertiary education organisations – and especially the universities – from all these sources. It includes an analysis of research financing of all the public tertiary education institutions. One section concentrates on the eight universities, as they are responsible for the great majority of the research in the tertiary education sector and win nearly all the research funding. The other focus is on research funding in the period between 2000 and 2005. All the income and expenditure presented in this chapter is exclusive of goods and services tax.

RESEARCH TOP-UPS FUNDING TO CEASE

By the end of 2007, the current research top-ups funding will cease and the Performance-Based Research Fund will be the main mechanism for distributing 'non-specific' government funding for research – funding allocated through a bulk grant and not tied to any specific research output – in tertiary education organisations. However, between 2000 and 2003, the main government funding for research in tertiary education was distributed by way of research top-ups – supplements to the tuition subsidy rates for domestic degree-level, postgraduate enrolments, and funding for international students engaged in postgraduate research. For more detailed information about how this funding has been estimated refer to the technical notes in chapter 17.

The rationale for basing the research funding allocation on enrolments was that degrees are required under the Education Act to be taught predominantly by staff active in research. This funding recognised that the research effort of the tertiary education organisations teaching at that level would need resourcing. However, distributing research funding on the basis of enrolments means that funding for one activity is dependent on performance in a different activity. This is distortionary.

ANALYTICAL TABLES: An associated set of tables on financing research in tertiary education is available on the Education Counts website, Tables RSF1-9. Detailed technical information on the data presented here can be found in chapter 17.



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The level of top-up income depended on the number of enrolments at degree level and higher, with the rate of top-up funding dependent on:

- the course classification and hence the funding category for enrolments in the field of study, and
- the level of study, with lower top-up rates being paid for undergraduate degree enrolments and higher rates for enrolments in taught postgraduate courses and for research degree enrolments.

The funding for international students engaged in postgraduate research was set at a much lower rate than for domestic students and varies by course classification and funding category. From 2006, new international students studying towards a doctorate degree will receive the same base level of funding as domestic doctorate students.

PERFORMANCE-BASED RESEARCH FUND

In 2004, the phase-in of the Performance-Based Research Fund began. From 2004 to 2006, the top-ups have been reducing as funding is transferred to the fund. In 2007, the phase-in will be complete. The Performance-Based Research Fund funding allocation formula uses an assessment of research quality and indicators of research performance.¹

CENTRES OF RESEARCH EXCELLENCE

Over 2001 and 2002, the government also established seven centres of research excellence – networks of researchers working in nationally important areas of research in which there is established capability. Each of the seven centres is hosted by a university. Funding for the centres is another source of research revenue.

VOTE RESEARCH, SCIENCE AND TECHNOLOGY AND 'OTHER' RESEARCH CONTRACT INCOME

Researchers also bid for research contract funding from organisations that commission research. There are two components to research contract income:

- research funding provided through the government's contestable research funds, and

- income provided by private sponsors of research who commission tertiary education organisations to conduct research projects.

The government is a major funder of research through Vote Research, Science and Technology, which provides funding for research contracts on a contestable basis.

The research top-ups, the Performance-Based Research Fund, centres of research excellence funding and Vote Research, Science and Technology together constitute the 'government research funding'.

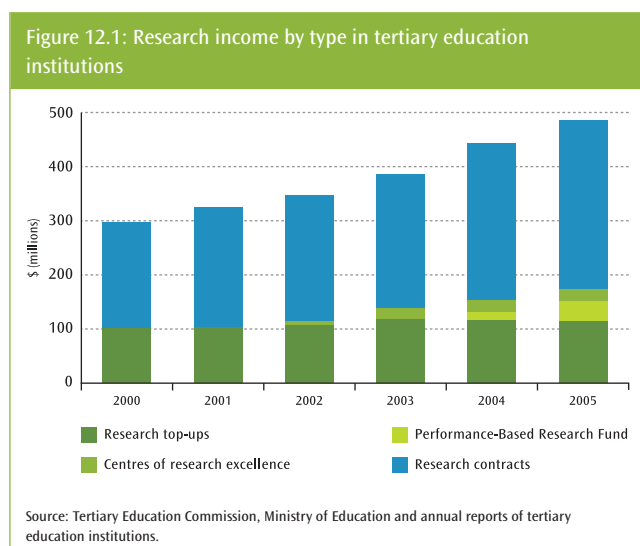
In addition to Vote Research, Science and Technology, tertiary education organisations win funding from private sponsors of research – firms and not-for-profit organisations that contract them to conduct specific pieces of research on their behalf, in order to meet their business needs. In this case the research outputs are being 'purchased' from the tertiary education organisation.

Government agencies also commission research as part of their ongoing business. Some of the research contracts will be let to tertiary education organisations. These contracts are not classified as government research funding for the purposes of this chapter, but are included as part of external research contract income.

¹ For more detail in how the funding is allocated see Tertiary Education Commission (2004).

RESEARCH FINANCING IN PUBLIC TERTIARY EDUCATION ORGANISATIONS

This section analyses the main types of research income in tertiary education organisations and the performance of the universities as well as other tertiary education organisations that conduct research. Figure 12.1 shows the research income of the public tertiary education institutions between 2000 and 2005 by type. For analysis purposes, the government funding for international students engaged in postgraduate research has been included in the top-ups allocation.



In 2005, tertiary education institutions received a total of \$485.8 million in research income, up from \$442.4 million in 2004 (an increase of 10 percent). In 2000, tertiary education institutions received \$297 million in research income. The universities earned 97 percent of the total research income of tertiary education institutions in 2000, rising to 98 percent in 2005, while institutes of technology and polytechnics earned 1.4 percent in 2000 and 1.7 percent in 2005. Research income in polytechnics rose by 91 percent over the same period, from \$4.3 million to \$8.2 million, compared with 65 percent for the universities.

In 2000, enrolments-based research funding accounted for 34 percent of the total research income and research contracts for 66 percent. In 2005, enrolments-based research funding made

up 23 percent of the research income, the Performance-Based Research Fund 8.0 percent, the centres of research excellence 4.4 percent, and research contracts 64 percent.

NON-SPECIFIC GOVERNMENT FUNDING OF RESEARCH

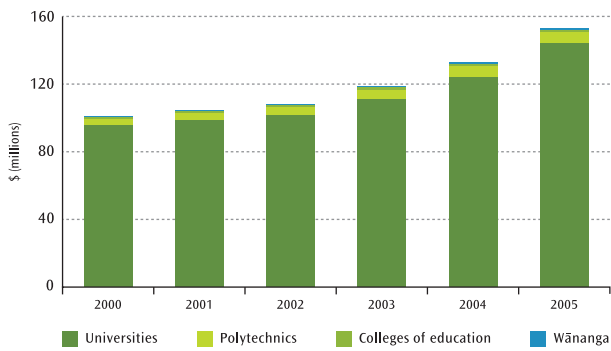
The non-specific government funding of research for tertiary education institutions was provided through enrolments-based funding between 2000 and 2003. Starting in 2004, part of that funding was shifted to the Performance-Based Research Fund. Most of the funding available for allocation under the Performance-Based Research Fund comes from a progressive transfer of the enrolments-based research top-ups funding. In 2004, 10 percent of the research top-ups funding was assigned to the fund and this increased to 20 percent in 2005. In 2006, 50 percent of top-ups funding will be directed to the Performance-Based Research Fund and in 2007 all money will have been transferred so there will be no top-ups funding. In addition to the money transferred from the top-ups, the government has agreed to inject new funding into the Performance-Based Research Fund. It is expected that in 2008 there will be around \$200 million in the Performance-Based Research Fund, some \$52 million above the amount in research top-ups.

The total amount provided to tertiary education institutions through enrolments-based funding and the Performance-Based Research Fund combined reached \$153 million in 2005, up by 15 percent on the figures in 2004, and up by 51 percent on the figures in 2000. The universities have won the largest share of that funding; their share was around 94 percent in each of these years, while the polytechnics earned about 5 percent. In 2005, the colleges of education won about 0.4 percent and wānanga 0.5 percent. Private training establishments also receive top-ups funding and Performance-Based Research Fund allocations. In 2005, their top-ups funding was less than \$1 million and the Performance-Based Research Fund allocations were around \$50,000.



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Figure 12.2: Top-ups and Performance-Based Research Fund allocations by sector



Source: Tertiary Education Commission and Ministry of Education.

The allocations through the Performance-Based Research Fund to all tertiary education organisations were \$16.1 million in 2004 and \$38.7 million in 2005. The forecast for 2006 is \$112.1 million. The fund's allocation formula has three components:

- the *research quality* scores obtained by the tertiary education organisation in the fund's most recent quality evaluation – a peer assessment of the research portfolios of each eligible staff member in the tertiary education organisation (60 percent of the weighting)
- the number of *research degree completions* recorded by the tertiary education organisation over the three most recent years (25 percent), and
- the amount earned by each tertiary education organisation as *external research income* over the three most recent years (15 percent).

The 2004 allocation was based on the 2003 quality evaluation and the performance of the two other measures in 2002. In 2005 and 2006, the fund's allocation was based on the 2003 quality evaluation scores, but the research degree completions and the external research income measures were updated to include 2003 and 2004 data, respectively. This means that the relative performance of the tertiary education organisations participating in the fund changed between 2004 and 2006.

Table 12.1 lists the share allocated to 13 tertiary education organisations – including all of the universities – for the year 2004, together with indicative allocations for 2005 and 2006. The fund allocations to the Auckland and Wellington colleges of

education have been included in the University of Auckland and Victoria University of Wellington allocations, respectively.

Table 12.1: Share allocations of the Performance-Based Research Fund

Tertiary education organisation	2004	2005	2006
	Actual	Indicative allocation	
	Percentage		
University of Auckland	28.9	28.9	29.9
University of Otago	22.5	21.7	21.1
Massey University	14.1	14.6	14.5
University of Canterbury	11.8	12.1	12.1
Victoria University of Wellington	8.7	8.6	8.6
University of Waikato	7.4	7.5	7.3
Lincoln University	3.4	3.4	3.3
Auckland University of Technology	1.8	1.8	1.7
Unitec New Zealand	0.9	0.9	1.0
Waikato Institute of Technology	0.2	0.2	0.2
Christchurch College of Education	0.1	0.1	0.1
Dunedin College of Education	0.1	0.1	0.1
Whitecliffe College of Arts and Design	0.1	0.1	0.1

Source: Tertiary Education Commission.

There were small changes in the share of the fund won by the participating tertiary education organisations between 2004 and 2006. The Universities of Auckland and Canterbury, and Massey University experienced small increases in shares. The remaining universities experienced small drops in share.

FUNDING BY PERFORMANCE-BASED RESEARCH FUND COMPONENT

The tertiary education organisations that won the largest share under the research degree completions measure in 2006 were the Universities of Auckland (\$6.6 million) and Otago (\$5.2 million) followed by Massey University (\$5.0 million). Combined, these three universities earned 59 percent of the total research degree completions allocation.

The funding allocations can also be weighted by the organisation's full-time equivalent count of its Performance-Based Research Fund-eligible staff to adjust for size. The highest allocation, based on full-time equivalent weighted research degree completions, was made to the University of Canterbury, followed by the University of Waikato and the University of Otago.

As was the case in the research degree completions measure, Auckland, Otago and Massey dominated the 2006 external research income allocations. These three universities attracted 75 percent of this allocation. On a per full-time equivalent basis, however, Lincoln University earned the largest allocation, followed by the Universities of Auckland and Otago.

FINANCING RESEARCH IN THE UNIVERSITIES

The characteristics of a university set out in the Education Act 1989 require that 'their research and teaching are closely interdependent and most of the teaching is done by people who are active in advancing knowledge...[and] they meet international standards of research...'.

In addition, universities are together responsible for nearly all of the research conducted in the tertiary education sector. It was noted above that, in 2005, they won 97 percent of all of the research funding and 94 percent of the core government research funding to tertiary education institutions.

This section looks in more detail at the financing of the research activities of the universities. It focuses especially on the sources of the financing of research in universities, separating from the research contract income the revenue of the centres of research excellence and also the income won by universities from the contestable research funds provided by the government under Vote Research, Science and Technology.

Total research income in the universities in 2005 was \$475.8 million. This represents 19.9 percent of all university income, compared with 20.3 percent in 2004, and 19.1 percent in 2000. Between 2000 and 2005, total research income in the universities grew by 65 percent.

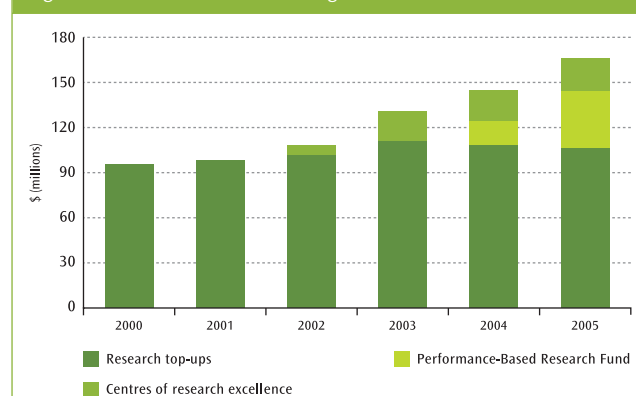
GOVERNMENT FUNDING FOR RESEARCH FROM VOTE EDUCATION

The non-specific government funding for research in the universities – enrolments-based research funding and the Performance-Based Research Fund – grew by 51 percent between 2000 and 2005, reaching \$144.6 million in 2005. This represented 30 percent of the research income in universities in 2005, compared with 29 percent in 2004 and 33 percent in 2000. The fall between 2000 and 2005 in non-specific government funding for research was due to the growth in external research contracts. In 2005, the combined funding from enrolments and the Performance-Based Research Fund represented 6.0 percent of total university income from all sources. This compares with 6.3 percent in 2000.

From 2002, the government has provided funding for the seven centres of research excellence. The seven centres are hosted by four universities, though each centre has formal partnerships with other universities, wānanga, and other research organisations. The host universities are the University of Auckland, Massey University, Victoria University of Wellington and Lincoln University. The University of Auckland holds four of the seven centres. The funding for centres of research excellence was phased in over 2002 to 2003. Funding in 2002 was \$6.5 million and this increased to \$19.4 million in 2003, \$20.4 million in 2004 and \$21.3 million in 2005.

The funding from the centres of research excellence, the Performance-Based Research Fund and the enrolments top-ups collectively represent the government's education funding for research via Vote Education.

Figure 12.3: Vote Education funding of research in universities



Source: Tertiary Education Commission and Ministry of Education.



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GOVERNMENT FUNDING FOR RESEARCH FROM VOTE RESEARCH, SCIENCE AND TECHNOLOGY

In addition to funding university research through Vote Education, the government supplies significant amounts of contestable research funding through Vote Research, Science and Technology. There are three organisations (called single purchase agents) who allocate this funding to research providers within broad parameters set by the government:

- the Health Research Council – allocates funding for the purchase and co-ordination of health research
- the Foundation for Research, Science and Technology – allocates funding for strategically important and priority areas of applied research, science and technology, and
- the Royal Society – allocates the Marsden Fund, intended to provide for pure basic research.

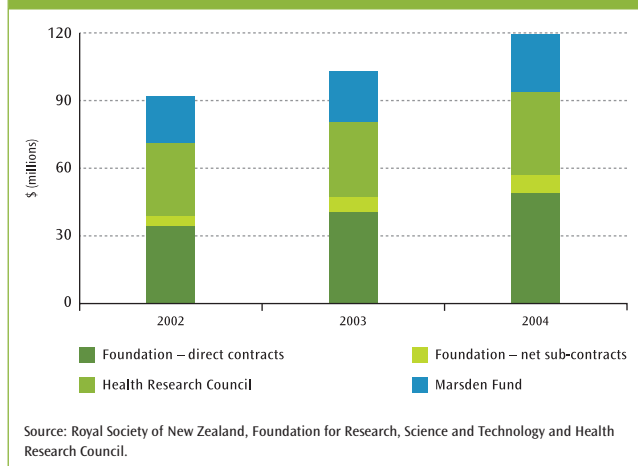
All three purchase agents use a contestable process, with research providers, including universities, putting proposals that set out the merit and costs of planned projects, describe how the projects align to the purchase agents' priorities and detail the bidder's track record in completing research.

To that extent, the Vote Research, Science and Technology funding to tertiary education organisations includes a strategic dimension (since it requires alignment with government priorities for research, which, in turn, reflect national economic and social goals) and an element of quality assessment.

Universities may win research contracts directly from the Foundation for Research, Science and Technology with the university as the lead provider in the research contract. In addition, because many of the foundation's contracts are very large and require wide ranges of expertise, the lead provider often lets out sub-contracts to other research organisations. Universities may be awarded a sub-contract by other research organisations. Also, when a university is the lead provider, it may sub-contract out work to other research organisations. In their annual accounts, the universities will record the direct contracts they have won plus any sub-contracts as income, without taking account of money that may have flowed to other types of research organisations. This has the effect of double counting the funding allocated from some of the foundation's contracts to the universities. To avoid this problem Figure 12.4 presents the funding allocated from the Foundation for Research, Science and

Technology as direct contracts and net sub-contracts – that is, the value of sub-contracts won less the value of sub-contracts let.

Figure 12.4: Vote Research, Science and Technology funding of research in universities



The research funding won by the universities from the research purchase agents in 2004 was \$119.1 million, up by 30 percent on 2002. However, the increase in funding of 30 percent between 2002 and 2004 needs to be placed in context as the total funding available for dispersion through the contestable funding also rose. Between 2002 and 2004, the contestable funding in Vote Research, Science and Technology increased by 16 percent. Consequently, the universities won an increased share of the allocation over that period.

RESEARCH CONTRACT INCOME

In their annual accounts, the universities record as research contract income all of the revenue they earn from bidding for contestable funds – such as the three Vote Research, Science and Technology funds – from centres of research excellence, from sub-contracts to Crown research institutes and other organisations, and research income from other sources such as private funders or 'purchasers' of research. Typically, purchasers of research are firms that commission universities to undertake research that will assist the firm in its business. The government can also be a purchaser of research services and these will be categorised by universities as research contract income. An example of this would be a ministry that contracts researchers from universities to analyse and research policy issues.

In the analysis in this section, we consider gross research contract income in the universities. This means we count all research income and do not adjust for the fact that some of the income may be passed on to other research providers as sub-contracts. This approach to counting research income aligns with the universities' annual accounts.

The total research contract income reported by the universities in their financial statements in 2005 was \$331.2 million, up by 7.2 percent on 2004. Research contract income represented 13.9 percent of all university revenue in 2005, compared with 14.4 percent in 2004 and 12.8 percent in 2000. The mergers of the Auckland and Wellington colleges of education in 2004 and 2005 with the respective universities is likely to have been a factor in the fall in research contract income as a proportion of the university sector's total revenue, as colleges typically have won only modest amounts of research contract income.

Figure 12.5: University research contract income



In Figure 12.6 university research contract income has been graphed per full-time equivalent academic staff.² In interpreting this graph, it is important to note that universities have different opportunities to earn research contract income. For instance, those universities involved with the centres of research excellence will obviously earn higher levels of income, while the two universities with medical schools – the Universities of Auckland and Otago – will tend to dominate the funding available through the Health Research Council. Likewise, there are some fields that tend to attract higher levels of research contract income; engineering is an example. Also, the mergers with colleges of education for the University of Auckland (in

2004) and Victoria University of Wellington (in 2005) would have reduced research contract income per full-time equivalent academic staff member.

Figure 12.6: University research contract income per academic staff member

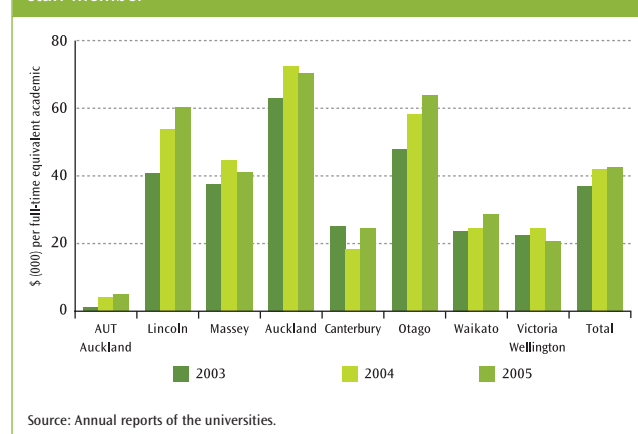
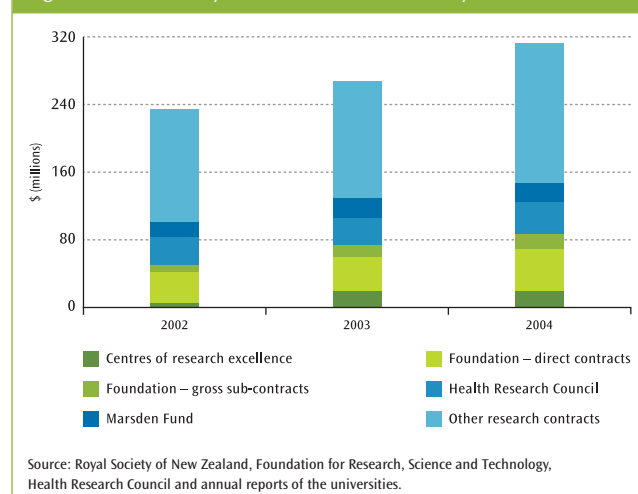


Figure 12.7 shows the split of the research contract income reported by universities in their financial statements in the years 2002 to 2004 by source of income. The funding allocations for the Foundation for Research, Science and Technology, referred to in this section and graphed below, are based on gross sub-contracting. This means that income received from sub-contracting is counted in university income but no adjustment is made for sub-contracting out by the universities.

Figure 12.7: University research contract income by source



2 The measure of research contract income used in Figure 12.6 is broader than that used by the Tertiary Education Commission for calculating external research income. In addition, Figure 12.6 uses full-time equivalent academic staff as the denominator, whereas the external research income measure discussed earlier uses full-time equivalent Performance-Based Research Fund-eligible staff as the denominator. Therefore, the results in Figure 12.6 may vary from those presented in earlier sections.



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Research contract income from 'other' sources represented \$161.1 million in 2004, a rise of 21 percent between 2002 and 2004. In 2004, this form of income made up 38 percent of all university research income. This compares with 40 percent in 2002.

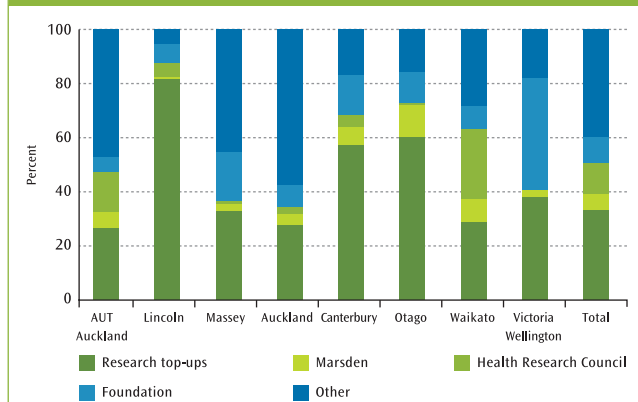
The scale of the ongoing growth in total research income can be attributed largely to increases experienced by most universities in their research income from other sources.

The total growth in university research income between 2002 and 2004 was \$97.4 million. The percentage share of this increase among the four main income sources is: 14 percent in centres of research excellence, 24 percent in funding from top-ups and the Performance-Based Research Fund, 33 percent in Vote Research, Science and Technology funding and 29 percent in 'other' research contract income.

The growth in the research income from 'other' sources is particularly important as it gives the best indicator of the extent to which the research of the universities is meeting the needs of businesses and communities. Any organisation prepared to fund research would do so because it considers that the findings are likely to be of value for that organisation. If that organisation has commercial objectives, it would be prepared to fund research if it has assessed that the long-term return – financial and non-financial – from the research produced by the project funded is greater than the expense of the funding. In addition, firms and community organisations will fund research only if they consider that research is of good quality. Therefore, the ability of a tertiary education organisation to earn significant research contract income over an extended time period indicates that the tertiary education organisation is perceived by funders as offering research outputs of good quality. Thus, if universities have increasing income from research contracts, that is an indicator of both the *quality* and also the *relevance* of the research the system produces.

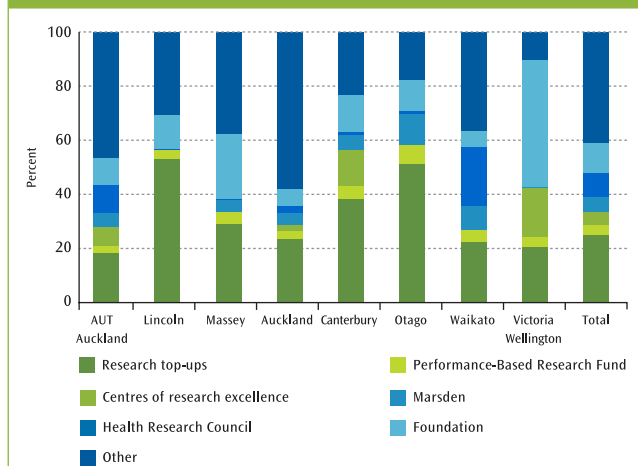
The following two graphs separately show the changes in the percentage of research income derived from different sources for the eight universities for the years 2000 and 2004. Note that in these graphs there has been no adjustment made for the effect of sub-contracting. Therefore the share of funding allocated by the Foundation for Research, Science and Technology is likely to be understated and the share of funding from 'other' research income overstated.

Figure 12.8: Percentage of university research income for 2000 by type



Source: Ministry of Education, Tertiary Education Commission, Royal Society of New Zealand, Foundation for Research, Science and Technology, Health Research Council and annual reports of the universities.

Figure 12.9: Percentage of university research income for 2004 by type



Source: Ministry of Education, Tertiary Education Commission, Royal Society of New Zealand, Foundation for Research, Science and Technology, Health Research Council and annual reports of the universities.

The share of research income sourced from enrolments-based top-ups has fallen at all universities between 2000 and 2004. This reflects the start of the transfer of top-ups funding to the Performance-Based Research Fund in 2004 and increased research income from other sources. However, the share of research income sourced from Vote Education by the universities has remained constant at 33 percent in 2000 and 2004.

RESEARCH EXPENDITURE

A recent report by the Ministry of Research, Science and Technology estimated the annual expenditure by universities on research and development. In 2004, total expenditure by the universities on research and development was \$455 million. This was an increase of 25 percent on spending of \$363 million in 2000, while in real terms this represents an increase of 15 percent.

Of the research and development expenditure in universities in 2004, 52 percent was spent on wages and salaries, 33 percent on other current items and 12 percent on capital items. As a percentage of gross domestic product, research and development expenditure by New Zealand universities was 0.33 percent in 2004. This compares with 0.45 percent in Australia and an OECD mean of 0.39 percent.

The estimated expenditure on research and development is compared with the research income of universities in Figure 12.10 below. It shows that although expenditure on research and development is higher than research income, the gap is closing. In 2002, research income was 77 percent that of research and development expenditure, compared with 95 percent in 2004.

References

- Ministry of Research, Science and Technology (2006), *Research and development in New Zealand, a decade in review*, Wellington.
- Tertiary Education Commission (2006), *Performance-Based Research Fund, 2005 annual report*, Wellington.

Figure 12.10: University research income and estimated research and development expenditure

