INTRODUCTION

This chapter provides an overview of the financing of research in tertiary education organisations (TEOs). The focus of the analysis is on the period 2000 to 2004. The analysis is also largely focused 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.

TEOs in New Zealand fund their research activities from a variety of sources. Part of the funding is allocated by the government and recognises the costs of research activities. In addition, many providers 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 as part of its funding for the national research, science and technology effort. This section looks at the revenue generated by TEOs – and especially the universities – from those sources.

Between 2000 and 2003, the main government funding for research in tertiary education was distributed through tuition subsidy funding, by way of research 'top-ups' – supplements to the tuition subsidy rates for degree-level and postgraduate enrolments. The rationale for allocating research funding through this means was that degrees are required under the Education Act to be taught predominantly by those active in research. The top-up funding recognised that the TEOs teaching at that level would have research activities that would need resourcing. The level of top-up income depends on the number of enrolments at degree level and higher, with the rate of the top-up funding depending on:

- the course classification and hence the funding category for enrolments in that field of study, and
- the level of the 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.

From 2004, the phase-in of the Performance-Based Research Fund (PBRF) began. In the years 2004, 2005 and 2006, the top-up funding reduces as funding is transferred to the PBRF. From 2007, the phase-in will be complete – the PBRF will be the main mechanism for distributing the whole of the core government funding for research in TEOs. The PBRF funding allocation formula uses an assessment of research quality and indicators of research performance.[1]

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

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 universities to conduct research projects.

The government is a major funder of research through Vote Research, Science and Technology (RST), which provides funding for research contracts on a contestable basis. The research top-ups, the PBRF, CoRE funding and Vote RST together constitute the 'government research funding'. In addition to Vote RST, universities win funding from private sponsors of research – firms and not-for-profit organisations that contract universities to conduct specific pieces of research on their behalf, in order to meet their business needs, ie the *purchase* of research outputs.[2]

OVERVIEW OF RESEARCH FINANCING

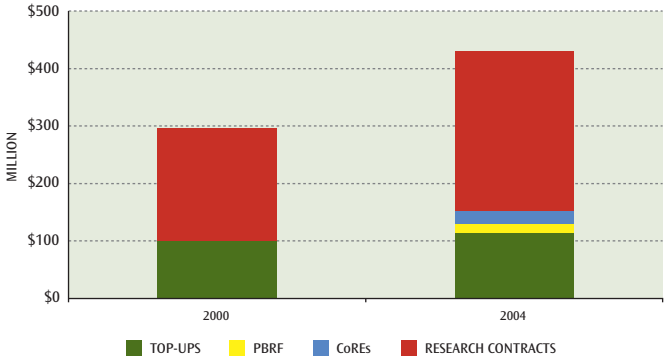
This section considers the main types of research income in TEOs, analysing the performance of the universities as well as other TEOs that conduct research.

Figure 15.1 looks at the total research income of the public tertiary education institutions (TEIs) between 2000 and 2004 by type.

1 Refer to Chapter 14 of this publication for a more detailed account of the PBRF funding mechanism. A full account of the working of the PBRF can be found in Tertiary Education Commission (2004), *Performance-Based Research Fund: Evaluating Research Excellence: The 2003 Assessment,* www.tec.govt.nz. Details of the rationale for the selection of the measures in the PBRF can be found in Ministry of Education and Transition Tertiary Education Commission (2002), *Investing in Excellence: The Report of the Performance-Based Research Fund Working Group,* www.tec.govt.nz. More summary accounts are given in Chapter 5 of the 2003 edition of this report at www.minedu.govt.nz/goto/tertiaryanalysis.

2 Government agencies also commission research as part of their ongoing business. Some of those research contracts will be let to TEOs. 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.

FIGURE 15.1: TOTAL RESEARCH INCOME BY INCOME TYPE AND BY TEI SUB-SECTOR 2000 AND 2004



Source: Tertiary Education Commission, Ministry of Education and annual reports of TEOs

In 2004, the TEIs had a total research income of $429.3 million, excluding GST, up from $296.5 million in 2000, an increase of 45 percent. The universities earned 97 percent of the total in 2000, rising to 98 percent in 2004, while the ITPs earned 1.6 percent of the total in 2000 and 1.8 percent in 2004; their research income rose by 65 percent over the period, compared with 46 percent for the universities.

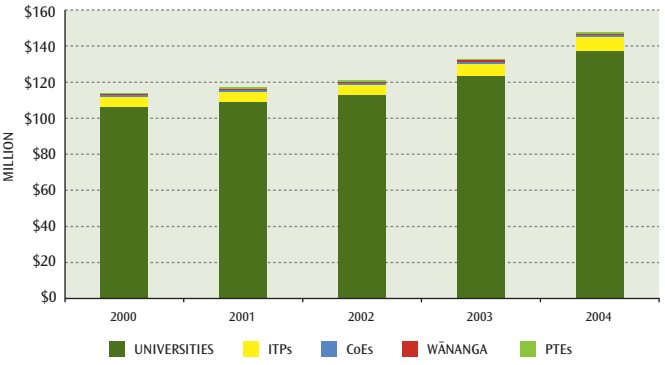
In 2000, the top-ups were 34 percent of total research income and research contracts 66 percent. Between 2000 and 2004, the top-ups grew by 14 percent while research contract income rose 41 percent. By 2004, top-ups made up 27 percent of total research income, the PBRF 4 percent, the CoREs 5 percent and research contracts 65 percent.

Core government funding of research

The core government research funding for TEOs was provided by research top-ups between 2000 and 2003. In 2004, part of that funding was shifted to the PBRF. The PBRF is being phased in over the period 2004 to 2007. Most of the funding available for allocation under the PBRF comes from a progressive transfer of the research top-ups funding. In 2004, 10 percent of the research top-up funding was assigned to the PBRF, while 20 percent was made available for 2005. In 2006, the proportion of the research top-up funding transferred will be 50 percent, while in 2007 all of the research top-up funding will have been transferred and there will be no research top-ups at all. In addition to the money transferred from the research top-ups, the government has agreed to inject new funding into the PBRF. It is expected that by 2009 there will be around $220 million (including GST) in the PBRF, some $55 million above the amount that would have been in the research top-ups, had there been no additional funding.

The total amount provided through the research top-ups and the PBRF combined reached $147.7 million in 2004, including GST, up by 11 percent on the figure for 2003 and by 30 percent since 2000. The universities have won the largest share of that funding; their share was around 93 percent in each of the years, while the institutes of technology and polytechnics (ITPs) earned about 5 percent. The colleges of education (CoEs) won about 1 percent and the wānanga and private training establishments (PTEs) 0.5 percent each.

FIGURE 15.2: FUNDING FOR RESEARCH THROUGH TOP-UPS AND PBRF BY SUB-SECTOR 2000-2004



Source: Tertiary Education Commission and Ministry of Education

The sum available for allocation under the PBRF in 2004 under the phase-in arrangements was $18.2 million, including GST, while in 2005 the amount grows to $43.6 million, again including GST.

The PBRF allocation formula has three components:

- the research quality scores obtained by the TEO in the most recent PBRF quality evaluation (60 percent of the weighting)
- the number of research degree completions (RDC) recorded by the TEO over the three most recent years (25 percent), and
- the amount earned by each TEO as external research income (ERI) over the two most recent years (15 percent).

The 2004 allocation was based on the 2003 quality evaluation and the performance of the TEOs in the two other measures up to 2002. The next quality evaluation is scheduled for 2006. Therefore, for 2005, the PBRF allocation was based on the same 2003 quality evaluation scores, but the RDC and ERI measures

were updated to include 2003 data. This means that the relative performance of the TEOs participating in the PBRF changed between 2004 and 2005.

There were small changes in the share of the PBRF won by the participating TEOs.[3] The Universities of Canterbury and Waikato, Lincoln and Massey Universities and Auckland University of Technology all experienced small increases in their share of the PBRF allocation. Massey, for instance, increased from 14.1 percent of the whole for 2004 to 14.6 percent in 2005. The Universities of Auckland and Otago and Victoria University of Wellington experienced small drops in their shares.

TABLE 15.1: PERCENTAGE OF TOTAL PBRF FUNDING WON BY SELECTED TEOs 2004-2005

	Percentage of total PBRF funding won	
	2004	2005
Auckland University of Technology	1.7%	1.8%
Lincoln University	3.4%	3.4%
Massey University	14.1%	14.6%
Unitec New Zealand	0.9%	0.9%
University of Auckland	28.8%	28.7%
University of Canterbury	11.9%	12.1%
University of Otago	22.5%	21.7%
University of Waikato	7.4%	7.5%
Victoria University of Wellington	8.7%	8.6%
Whitecliffe College of Arts and Design	0.1%	0.1%

Source: Tertiary Education Commission

The TEOs that won the largest share of the total allocated under the RDC measure in 2005 were the Universities of Auckland ($2.21 million) and Otago ($2.16 million) and Massey University ($2.00 million). Among them, they earned 58 percent of the available funding. When one weights the allocations by the number of PBRF-eligible, full-time equivalent (FTE) staff employed in the TEOs, however, a different picture emerges. Weighting the allocation according to the number of FTE staff, the TEO with the highest allocation was the University of Canterbury, followed by the University of Waikato, Victoria University of Wellington and Lincoln University.

Likewise, Auckland, Otago and Massey dominated the ERI allocation, winning 75 percent of the total among them. Weighting by FTE, Auckland and Otago are still the highest two TEOs, with Lincoln third.

FINANCING RESEARCH IN THE UNIVERSITIES

Introduction

The characteristics of a university set out in the Education Act 1989 require that '...their research and teaching are closely interdependent and most of their teaching is done by people who are active in advancing knowledge ...[and] they meet international standards of research ...'[4]

In addition, the universities are together responsible for nearly all of the research conducted in the tertiary education sector. It was noted above that in 2004, they won 98 percent of all of the research funding and 93 percent of the core government research funding. 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 CoREs' revenue and also the income won by the universities from the contestable research funds provided by the government under Vote RST. Because of the timing of information on research allocations made from the government's contestable research funding, some of the analysis deals with the years 2000 to 2003.

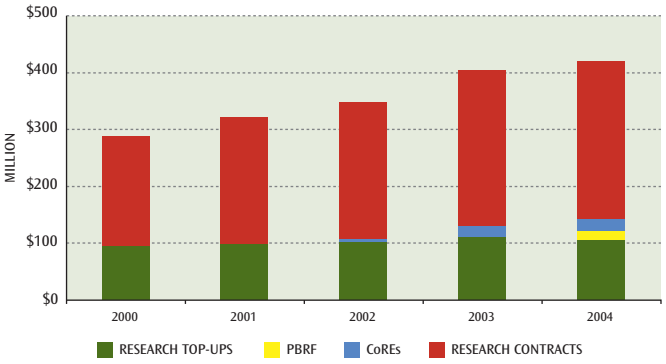
Total research income in the universities

Research income in the universities in 2004 was $419.6 million, excluding GST, representing 19.6 percent of all university income, compared with 20.8 percent in 2003 and 19.1 percent in 2000. Between 2000 and 2004, total research income in the universities grew 45.7 percent in nominal terms or about 33 percent adjusted for price movements.

3 The information in this section is largely drawn from Tertiary Education Commission (2005), *Performance-Based Research Fund: 2004 Annual Report.*

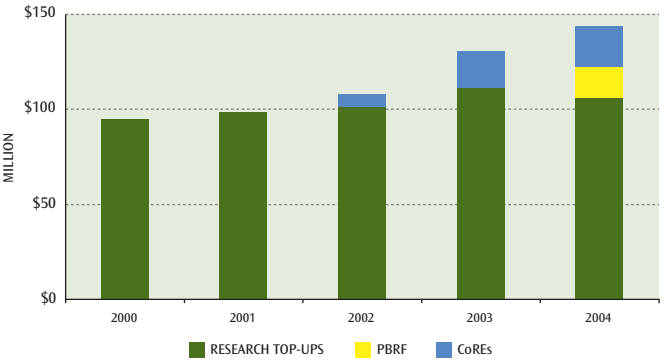
4 Education Act 1989, section 162(4).

FIGURE 15.3: TOTAL RESEARCH FUNDING IN THE UNIVERSITIES 2000-2004



Source: Tertiary Education Commission, Ministry of Education and annual reports of universities

FIGURE 15.4: GOVERNMENT FUNDING FOR RESEARCH IN THE UNIVERSITIES THROUGH VOTE EDUCATION 2000-2004



Source: Tertiary Education Commission and Ministry of Education

Government funding of university research income

The core government funding for research in the universities – research top-ups and PBRF – grew by 28.8 percent between 2000 and 2004, reaching $137.2 million (including GST) in 2004. Those forms of income represented 29.1 percent of total research income in the universities in 2004 compared with 32.9 percent in 2000, with this fall attributable to the extent of growth in income from research contracts. In 2004, this form of funding represented less than 5 percent of total university income from all sources, compared with 6 percent in 2000.

From 2002, the government provided funding for the seven CoREs. The seven CoREs are hosted by four of the universities, though each CoRE has formal partnerships with other universities, wānanga and research organisations.[5] The four host universities are the University of Auckland, Massey University, Victoria University of Wellington and Lincoln University. The University of Auckland hosts four of the seven CoREs. CoRE funding was phased in over 2002 to 2003, with funding of $7.3 million in 2002, rising to $21.9 million in 2003 and reaching $23.0 million in 2004.

The CoRE funding, the PBRF funding and the research top-ups collectively represent the government's education funding for research.

In addition to funding university research through Vote Education, the government supplies much of the funding for contestable research funds through Vote RST. There are three organisations (called purchase agents) who allocate Vote RST funding to research providers within broad parameters set by the government:[6]

- the Health Research Council (HRC) – allocates funding for the purchase and co-ordination of health research
- the Foundation for Research, Science and Technology (FRST) – 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 the planned projects, describe how the projects align to the purchase agent's priorities and detail the bidder's track record in completing research.

To that extent, the Vote RST allocation of research funding to TEOs 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.

Research income from these research purchase agents was $98.4 million in 2003, representing 26 percent of all university research income in 2003, compared with 30 percent in 2000. After a small decrease in the value of research income from these three sources between 2000 and 2001, there was an increase of $11.2 million between 2002 and 2003. This equates to a 13 percent

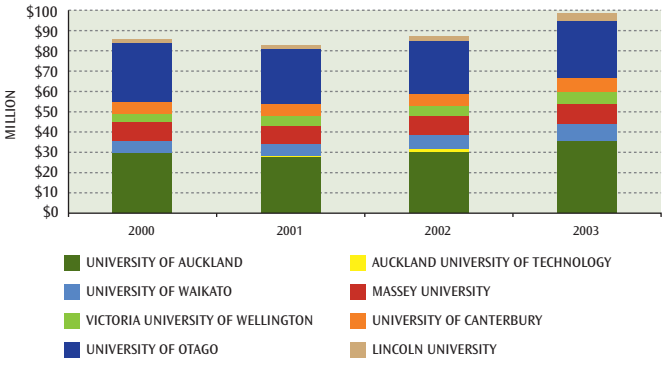
5 Refer to Chapter 14 of this publication for information on the focus of the seven CoREs and the distribution of funding among the seven.

6 A more detailed explanation of the different foci of the funds administered by the three purchase agents is available at http://www.morst.govt.nz/?CHANNEL=WHO+DOES+THE+FUNDING%3F&PAGE=Who+does+the+funding%3F.

increase between 2002 and 2003, while there was a 15 percent increase between 2000 and 2003.[7]

The 13 percent increase between 2002 and 2003 needs to be seen alongside a rise of around 6 percent in the funds available for disbursement by the Crown purchase agents over that period. The 15 percent increase over the period 2000 to 2003 compares with an increase of 14 percent in total research grant funding in Vote RST over the same period.

FIGURE 15.5: UNIVERSITY RESEARCH INCOME FROM VOTE RST – MARSDEN, FRST AND HRC 2000-2003



Source: Royal Society of NZ, Foundation for Research, Science and Technology, and Health Research Council

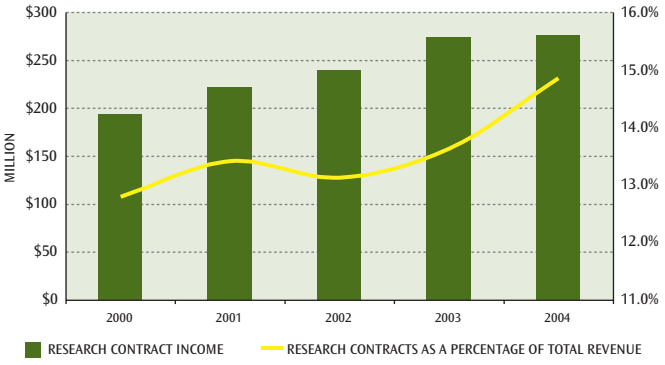
It is important to note that the Vote RST data presented in Figure 15.5 understates the total university earnings from Vote RST because it excludes income from sub-contracts won by the universities from lead contractors (such as Crown Research Institutes (CRIs)).[8]

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 RST funds – from CoREs, from sub-contracts to CRIs 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 some research that will assist the firm in its business. The government can also be a purchaser of research services that are attributed to the 'other' category. An example of this would be a ministry that contracts researchers from universities to analyse and research policy issues.

The total research contract income of the universities in 2004 was $297.7 million, up by 54 percent on $193.2 million in 2000. Research contract income represented 13.9 percent of all university revenue in 2004, compared with 12.8 percent in 2000.

FIGURE 15.6: UNIVERSITY RESEARCH CONTRACT INCOME 2000-2004



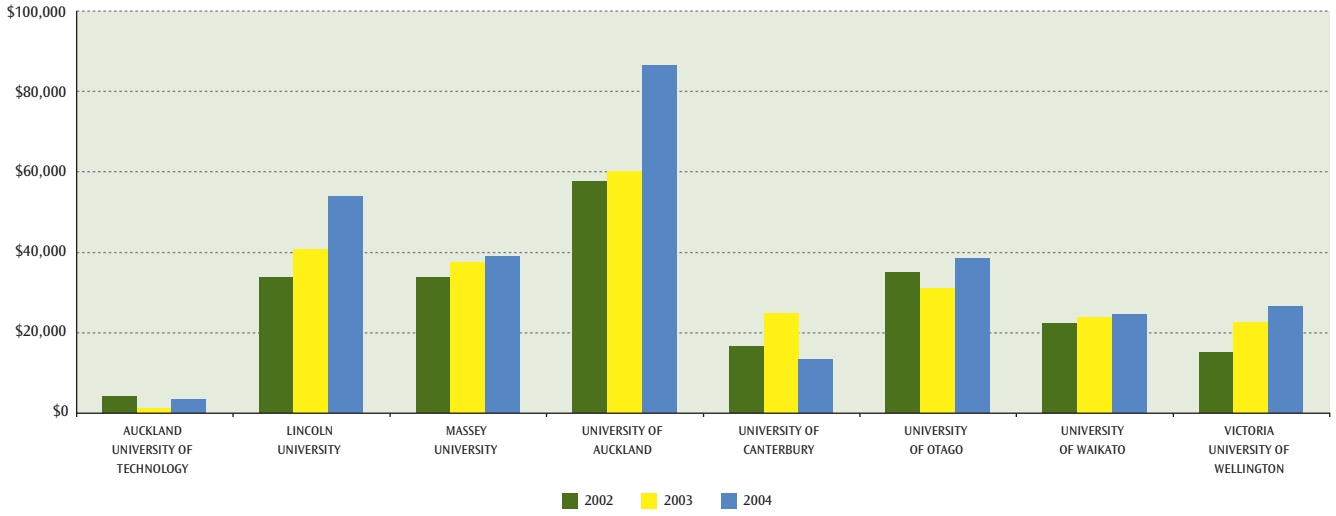
Source: Annual reports of universities

Figure 15.7 relates the amount of research contract income to the number of academic staff in the university.

7 The funding is recognised in the accounts of the purchase agents when they allocate the funds to the providers. The providers recognise the income in their accounts at the point when the money is expended by them. As a result, there are timing differences between the two parties. In this analysis, we ignore this difference.

8 The amounts exclude funding earned through sub-contracts in FRST contracts. Sub-contracts are valued at about a further $6 million per annum.

FIGURE 15.7: UNIVERSITY RESEARCH CONTRACT INCOME PER FTE ACADEMIC STAFF MEMBER 2002-2004



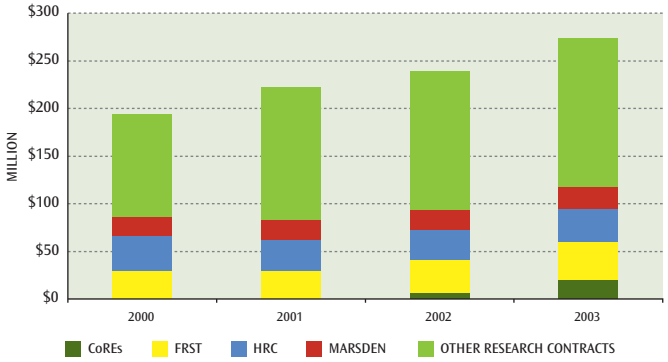
Note: Reclassification of staffing types in several universities has affected the results in those universities.

Source: Annual reports of universities

In interpreting Figure 15.7, it is important to note that different universities have different opportunities to earn research contract income. For instance, those universities that are involved with the CoREs will obviously earn higher levels, 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.

Figure 15.8 shows the split of the research contract income in the years 2000 to 2003 by source of income.

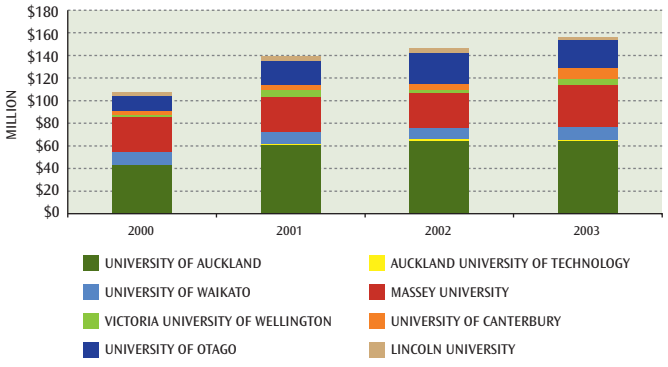
FIGURE 15.8: UNIVERSITY RESEARCH CONTRACT INCOME BY SOURCE 2000-2003



Source: Tertiary Education Commission, annual reports of universities, Royal Society of NZ, Foundation for Research, Science and Technology, and Health Research Council

Research contract income from 'other' sources represented $156 million in 2003, a rise of 45 percent between 2000 and 2003. By 2003, that form of income made up 39 percent of all university research income. This compares with 36 percent in 2000.

FIGURE 15.9: RESEARCH CONTRACT INCOME FROM OTHER SOURCES BY UNIVERSITY 2000-2003



Source: Annual reports of universities

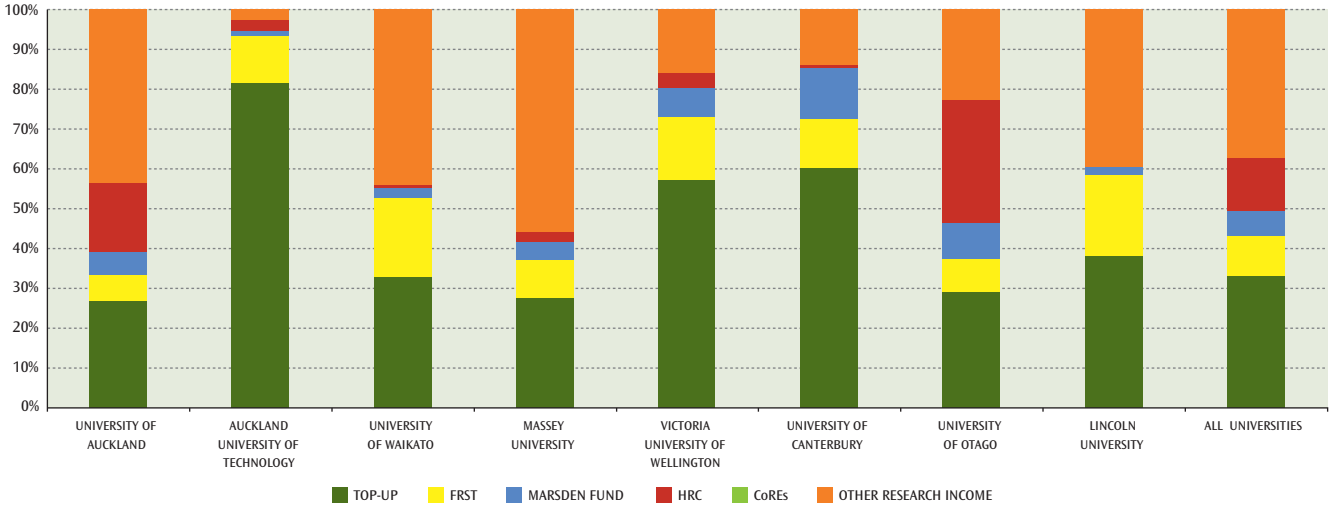
The scale of the ongoing growth in total research income can be attributed largely to increases experienced by almost all universities in their research income from these other sources.

The total growth in university research income in dollar terms between 2000 and 2003 was $112.8 million. The percentage share of this increase among the four main income sources (CoREs, research top-ups and PBRF, Vote RST research income and other research contract income) is 17 percent CoREs, 29 percent top-ups and PBRF, 11 percent Vote RST and 42 percent 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 the findings likely to be of value to 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 TEO to earn significant research contract income over an extended period indicates that the TEO is perceived by funders as offering research outputs of good quality. Thus, if the universities have increasing income from research contracts of that nature, that is an indicator both of the quality and also of the relevance of the research the system produces.

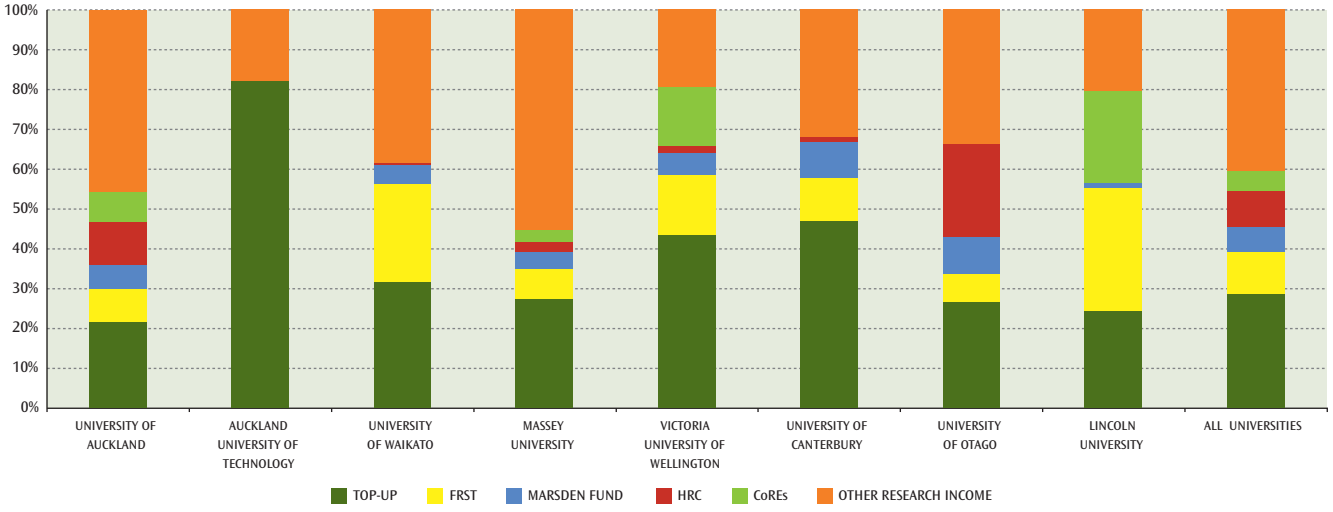
The following two graphs show the changes in the percentage of research income derived from different sources for the eight universities.

FIGURE 15.10: PERCENTAGE OF TOTAL UNIVERSITY RESEARCH INCOME BY INCOME TYPE FOR EACH UNIVERSITY 2000



Source: Tertiary Education Commission, annual reports of universities, Royal Society of NZ, Foundation for Research, Science and Technology, and Health Research Council

FIGURE 15.11: PERCENTAGE OF TOTAL UNIVERSITY RESEARCH INCOME BY INCOME TYPE FOR EACH UNIVERSITY 2003



Source: Tertiary Education Commission, annual reports of universities, Royal Society of NZ, Foundation for Research, Science and Technology, and Health Research Council

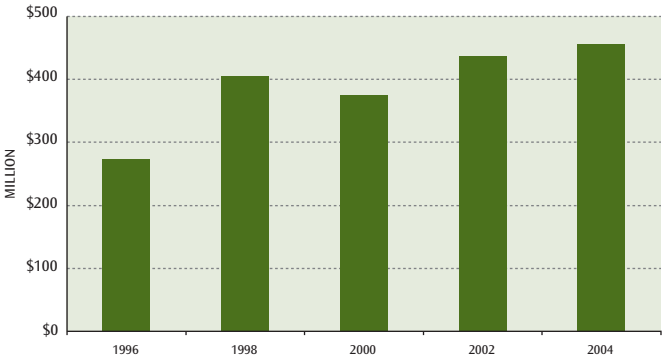
All universities have experienced increases in their research income from other sources as a percentage of total research income, with Victoria University of Wellington experiencing the highest growth at 18 percent.

Research expenditure

In its 2004 biennial survey of research in New Zealand, the Ministry of Research, Science and Technology (MoRST) and Statistics New Zealand (SNZ) reported that universities estimated[9] they spent $454.8 million on their research activities in 2004, up by 4.4 percent on the figure of $435.8 million reported in 2002. This represented an increase of 66.3 percent on 1996.

9 The figures in this section are based on expenditure reported by the universities in response to the MoRST/SNZ biennial surveys of university research expenditure. Because the survey required an estimate of the proportion of each staff member's time devoted to research, the figures cannot be regarded as precise. In addition, there was a change in the methodology in 2002, meaning that caution needs to be exercised in comparing the 2002 result with the data for previous years.

FIGURE 15.12: ESTIMATED EXPENDITURE ON RESEARCH BY UNIVERSITIES 1996-2004

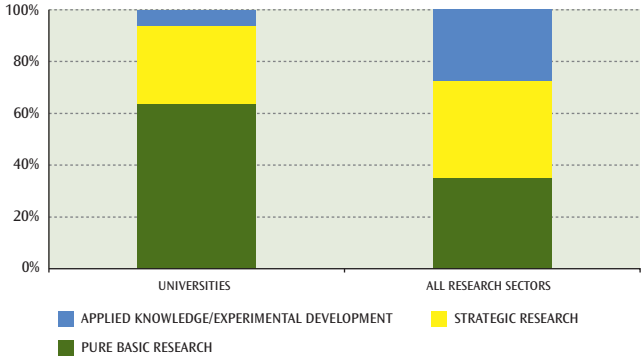


Source: Statistics New Zealand and Ministry of Research, Science and Technology

The 2004 research expenditure in the universities represented 0.33 percent of gross domestic product, compared with 0.35 percent in 2002 and 0.33 percent in 2000. The average for all OECD countries in 2001 was 0.40 percent.[10] MoRST and SNZ report that universities accounted for 28 percent of all New Zealand research and development expenditure in 2004, compared with 33 percent in 2002 and 34 percent in 2000.

Higher education research expenditure is divided roughly equally between basic research, strategic research and applied knowledge/experimental development. Compared with other research sectors, research expenditure in higher education is heavily weighted towards basic and strategic research.

FIGURE 15.13: PERCENTAGE OF UNIVERSITY RESEARCH EXPENDITURE COMPARED WITH OTHER SECTORS BY RESEARCH TYPE 2004



Source: Statistics New Zealand and Ministry of Research, Science and Technology

In a recent MoRST analysis of data on the cost-effectiveness of the research sector, New Zealand was ranked second of the 22 countries assessed in terms of the number of papers for every million dollars of research investment (normalised for variations in purchasing power).

10 This figure is cited in the MoRST/SNZ biennial report *Research and Development in New Zealand 2004*.