THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

Commentary On Issues of Higher Education and Research

A publication of the Office of the Vice-Chancellor, The University of Auckland | July 2010 | Issue 6

Investment in universities: high rates of private and public return

In previous issues of Commentary we discussed the characteristics and contribution of research-led universities. In this issue of Commentary we take a look at the personal (private) and public benefits of higher education and research. Critically, we explore estimates of return on investment in university education, training and research during this time of global financial constraint. As we will see, universities represent one of the best investments available to both governments and the private individual.

A time for investment

'Education is an investment in the future of our societies. We need to get it right'.[1]

Over the past three years, we have experienced economic turmoil on a scale not seen internationally for many decades. The contraction of economies, along with a dramatic reduction in available credit, has led to significant financial restraint being exhibited in expenditure and investment decisions by both individuals and governments.

However, many economies, including New Zealand's, are now showing signs they may have reached the bottom of the economic slowdown, and are starting to make decisions about where future expenditure and investment might best be targeted. Against a backdrop of limited resources and uncertainty about the medium-term prospects for past sources of growth (such as property, construction and the financial sectors), forward-looking governments are seeking areas likely to bring strong, sustainable and long-term growth.

Through teaching, research and commercialisation activities, universities provide a rich source of innovation and human capital to industry and to our wider society. As previously explored in Commentary Issue 1[2] (August 2007), the relationship between university research and economic growth is well documented. For example, estimates of the contribution universities have made to total economic growth in the United States since WWII range from 12% - 25%.[3] A number of more recent studies have confirmed the importance of research universities to regional economic development in the United Kingdom and Europe – such universities are acting as key sources of productivity growth, drivers of change, and promoters of innovation.[4] In the United Kingdom, universities are estimated to contribute at least £59 billion annually to the country's economy.[5]

1 Remarks by Angel Gurría, OECD Secretary-General, for the launch of Education at a Glance 2009: OECD Indicators. OECD Conference Centre, Paris, 8 September 2009.

2 The University of Auckland, 2007. Commentary. Issue 1, August 2007. Available online: www.auckland.ac.nz/commentary

3 Committee for Economic Development, 1998. America's Basic Research: Prosperity through Discovery. Available online: http://ced.issuelab.org/research/listing/americas_basic_research_prosperity_through_discovery

4 P Arbo and P Benneworth, 2007. Understanding the Regional Contribution of Higher Education Institutions: a Literature Review. Available online: www.oecd.org/dataoecd/55/7/37006775.pdf

5 Remarks by Lord Mandelson, 4 November 2009, at launch of Universities UK report. 'Universities value to economy increase – UUK report'. Available online: www.universitiesuk.ac.uk/Newsroom

However it is only relatively recently that higher education has come to be seen as an investment: a private investment by individuals in their future, and a public investment by taxpayers and governments in people and ideas, and in a country's future social, cultural and economic prosperity.

Investing in universities offers high rates of return

The role of universities is diverse and far-reaching. Universities teach undergraduate and postgraduate students; they train professionals, artists, scientists, and researchers; they create new knowledge for the benefit of society; they engage with communities, individuals, professional groups and government; and, as enshrined within New Zealand law, they are a repository of knowledge and expertise, and accept a role as critic and conscience of society – all within a context of active research and teaching consistent with international standards.[6]

In their simplest form, universities create and communicate knowledge.

For employers, government, and the national and international community, that knowledge contributes to the development of new ideas, creative works and innovative techniques, to improved labour market productivity, and to higher levels of taxation revenue. For graduates, it includes both specialist knowledge and the general intellectual and life skills that will equip them for employment and citizenship and lay the foundations for a lifetime of continuous learning and personal development.[7]

In addition, the social benefits of advanced levels of education are many: 'Educational attainment is positively associated with self-reported health, political interest and interpersonal trust'.[8] Walter McMahon, an educational economist, argues that approximately half of the benefits of higher education can be seen in better job opportunities, improved earnings and health for the individual. The other half, he believes, can be seen in benefits for wider society, including promoting democracy and sustainable growth and reducing welfare costs and crime.[9]

Public returns to university study and research

A university education creates high rates of public return on investment. For example, in 2007, a study was undertaken in the United Kingdom looking at the student tuition component of higher education funding. The authors found an average rate of return for publicly funded university education of approximately 11% for the government.[10] In the United States, the return on public investment is estimated to be 10.3% above inflation – or at least US$7.46 for every dollar the government invests in a college graduate.[11]

A recent Australian report estimated the real rates of return for university education, and arrived at a similar figure – approximately 11%. The report also estimated rates of return of between 20% and 40% for publicly funded university research.[12] Combined, 'the estimated IRR (Internal Rate of Return) for this investment is 14% per annum in real terms, considering the labour force benefits, productivity benefits, and the timing of each'.[13] The authors suggest that this relatively high IRR provides a strong case for increased investment in universities.

This view is backed up by the OECD in its regular analysis of the IRR of public investment in tertiary education. The OECD has found that, on average, tertiary education generates a rate of return of 11% for males and 9% for females when higher education is undertaken after leaving school; when undertaken at age 40, the public returns are reduced slightly to 9.5% for males and 6.6% for females.[14] In 2009, the OECD found that the average net public return from an investment in tertiary education across all countries was almost twice the average level of public investment made in tertiary education, advocating on this basis that 'public investments in education and particularly at tertiary level would be rational even in the face of running a deficit in public finances'.[15]

Considering the performance of other government investment options, particularly given current economic conditions, this is an extraordinary rate of return which is compounded further

6 Education Act (1989), Section 162.

7 The University of Auckland, 2003. Graduate Profile. Available online: www.auckland.ac.nz/uoa/home/about/teaching-learning/principles

8 OECD, 2009. Education at a glance 2009: OECD indicators. p171.

9 Walter W. McMahon, 2009. Higher Learning, Greater Good: The Private and Social Benefits of Higher Education. The Johns Hopkins University Press, Maryland.

10 PricewaterhouseCoopers, 2007. The economic benefits of a degree. Research report prepared for Universities UK. Available online: www.universitiesuk.ac.uk/Publications/Pages/Publication-257.aspx

11 Trostel, P A, 2008. High returns: Public investment in higher education. Federal Reserve Bank of Boston, Spring 2008. Available online: www.bos.frb.org/commdev/c&b/2008/spring/Trostel_invest_in_higher_ed.pdf

12 KPMG EconTech, 2009. Economic modelling of improved funding and reform arrangements for universities. Available online: www.universitiesaustralia.edu.au/documents/publications/policy/submissions/KPMG-Econtech-April-2009.pdf

13 ibid, p12.

14 OECD, 2008. Education at a glance 2008: OECD indicators. p192. Note: The public rate of return from tertiary education differs for males and females because of variances in time in employment and in earnings. The OECD observes that this holds true for all countries and at all levels of educational attainment, finding that 'Females are typically disadvantaged in the labour market in terms of employment owing, among other things, to cultural differences and child-rearing responsibilities' (p189).

15 OECD, 2009. Education at a glance 2009: OECD indicators. p162.

by flow-on effects for the growth of the economy and for the wellbeing of individuals.

Private returns to university study

There is no doubt that a university qualification provides a very high rate of return to graduates and their families. In a recent report from the Ministry of Education and Statistics New Zealand, the earnings of graduates with a bachelors degree were found to be 51% higher three years after the completion of study than those of workers with only an upper-secondary level equivalent qualification.[16] The report also highlighted the importance of completing university study, finding that graduates who had finished their degree earned 29% more than those who did not complete their studies.

The same report confirmed the value of university study compared with other forms of tertiary education. The authors found that the median first-year earnings of polytechnic bachelors degree graduates were 7% or $2,500 lower than those of university degree graduates. The earnings differential between polytechnic and university degree holders increased further to 13%, or $5,600, after three years.

As shown in Figure 1, graduates who completed a masters degree or doctorate (qualifications awarded almost entirely by New Zealand's eight universities) can expect median annual earnings three years after the completion of their studies that are respectively 16% and 46% higher than those of graduates with a bachelors degree. All earnings are shown relative to those who completed level 1 to 3 certificates (which are equivalent to upper secondary level qualifications).

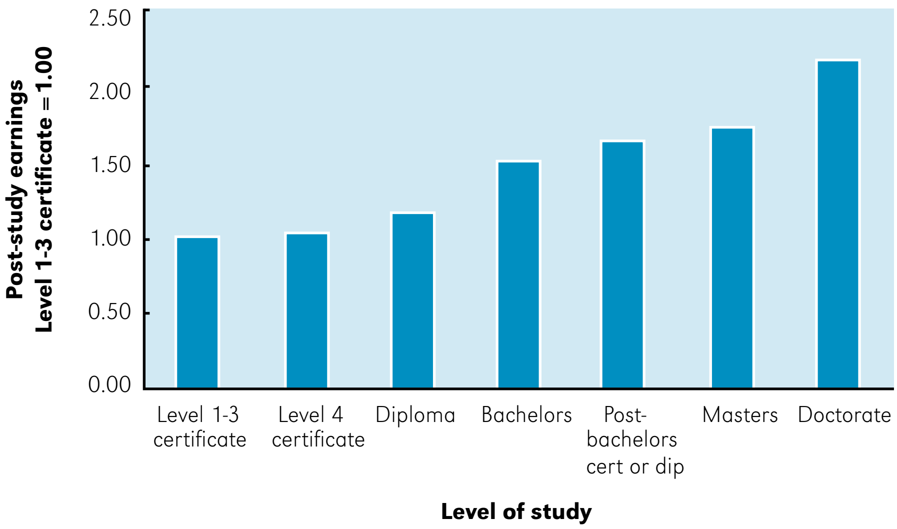
Similar results can be found in Australia, where each year of a university bachelors degree is estimated to raise annual earnings by approximately 15%.[18]

According to the OECD's latest analysis of graduate earnings across all OECD countries, a male student who completes a university degree can anticipate an average earnings premium of US$186,000 (ca NZ$263,000) over his lifetime as compared to someone with only secondary school qualifications. The comparable figure for a female is lower at US$134,000 (ca NZ$189,000) – 'reflecting the disparity in most countries between male and female earnings'.[19]

Research in the United Kingdom suggests that the financial advantage (or 'graduate premium') created by graduation from university is £160,000 (ca NZ$333,000) over the working life of a graduate, compared with a worker holding only upper secondary qualifications (two or more 'A levels').[20] The premium differs significantly by field of study, with the graduate premium of a medical graduate estimated to be closer to £340,000 (ca NZ$708,000). This represents an average rate of return on investment in education of approximately 13% per annum.[21]

In New Zealand, analysis would suggest the earnings premium from degree-level

Figure 1: New Zealand domestic students' post-study earnings three years after completion of the qualification (relative to earnings of those achieving Level 1-3 certificates)[17]



[16] Statistics New Zealand and the Ministry of Education, 2009. What do students earn after their tertiary education? Available online: www.educationcounts.govt.nz/publications/tertiary_education/57456

[17] ibid. Data in Figure 1 relates to domestic students only, and 'young completors' last enrolled in 2003. According to the study's authors, young completors 'represent the more traditionally-defined students who moved to tertiary education more or less directly after school and who were more likely to be completing their tertiary education for the first time, and entering the labour market proper for the first time' (p7).

[18] Leigh, Andrew, 2007. Returns to education in Australia. Published by the Centre for Economic Policy Research, Australian National University.

[19] OECD, 2009. 'Invest in education to beat recession, boost earnings'. Press release 8 September 2009.

[20] PricewaterhouseCoopers, 2007. The economic benefits of a degree. Available online: www.universitiesuk.ac.uk/Publications/Pages/Publication-257.aspx

[21] ibid

[22] Statistics New Zealand and the Ministry of Education, 2009. What do students earn after their tertiary education? Table 10, p24.

study exceeds these estimates. According to the 2009 Ministry of Education/Statistics New Zealand report, at three years post-study, the median earnings of a graduate with a bachelors degree were NZ$41,300. This compares with NZ$27,400 for a worker who had completed only a level 1 to 3 certificate.[22] Conservatively assuming that this differential remained constant, over 40 years of employment the earnings premium for the degree-qualified worker would be at least NZ$550,000 for the individual - and over NZ$125,000 in additional tax revenue for the government.[23] The report suggests the private and public financial returns from postgraduate study would be even higher.

A lost opportunity

'...the future is purchased by the present.'[24]

As we have noted above, the private and public benefits of universities are highly positive, both internally and as compared to other forms of investment. Graduates, particularly university graduates, can look forward to higher incomes, and longer and healthier lives. Government and the public benefit through increased tax returns as a consequence of graduates earning higher salaries and having lower health costs, as well as through the outcomes of research, development of intellectual and social capital, and the training of professionals and other highly-skilled and flexible graduates.

Why then does New Zealand continue to under-invest in tertiary education, and specifically, in its universities?

As a proportion of GDP, New Zealand's public investment in tertiary education is above average (1.6% compared with an OECD average of 1.3%).[25] However, an unusually high proportion of that investment is devoted to the financial support of students, rather than to tertiary institutions – that is, to making tertiary education cheap rather than enhancing its quality.

As is shown in Table 1, 42.3% of New Zealand's public investment in tertiary education is spent on student loans and scholarships, leaving 57.7% for direct public expenditure on tertiary institutions. This compares with an OECD average of 18.4% for student support, and 80.9% for tertiary institutions.[26]

While the expansion of the student loan scheme contributed to improvements in New Zealand's tertiary participation and graduation rates, such expenditure is unlikely to produce the 14% returns estimated for research universities, and will not contribute to tertiary institute funding and quality. The long-term consequence of this is likely to be an erosion of universities' infrastructure and resources, including teachers, researchers, and New Zealand's best students, many of whom are already looking overseas to educational systems with higher levels of investment in tertiary institutions.

Table 2 shows how a reduced investment in tertiary institutions translates to significantly lower annual expenditure per student - $9,288 compared with an OECD average of $12,336 $US PPP ('Purchasing Power Parity').[28] At the same time, New Zealand has the lowest student fees of any comparable country (and those in the table contain approximately 70% of the world's top 100 universities).[29]

And unfortunately for New Zealand, the per student expenditure of other countries is likely to increase and the gap widen. In May 2009, for example, the Australian Federal Government announced A$5.3 billion of additional

Table 1: Direct expenditure for tertiary institutions and financial aid for students, as a percentage of total public expenditure on tertiary education (2006)[27]

Country	Total public expenditure on tertiary education as % of GDP	% direct expenditure for institutions	% financial aid to students
New Zealand	1.6%	57.7%	42.3%
Australia	1.1%	69.0%	31.0%
United States	1.4%	69.1%	30.9%
United Kingdom	1.1%	73.6%	26.4%
OECD average	1.3%	80.9%	18.4%
Canada	1.8%	81.9%	17.1%

23 In 2009 dollars based on individual tax rates for the 2008/09 year. Note: this estimate is indicative only and does not take into account the realities of employment for individuals, including periods of time out of the workforce, nor the costs associated with study (including foregone earnings).

24 Johnson, Samuel, 1751. The Rambler # 178, 30 November 1751.

25 OECD, 2009. Education at a Glance 2009: OECD indicators. Table B4.1 p241.

26 Does not add to 100% as other forms of 'public subsidies for education to private entities' have been omitted from this analysis due to missing data for the countries included in the table. In 2006, the OECD average for these scholarships and other grants was estimated to be 0.7% of public expenditure.

27 OECD, 2009. Education at a Glance 2009: OECD indicators. Table B5.4, p260.

28 'Purchasing Power Parities (PPPs) are currency conversion rates that both convert to a common currency and equalise the purchasing power of different currencies. In other words, they eliminate the differences in price levels between countries in the process of conversion'. Definition and further information available from OECD website: www.oecd.org/std/ppp.

investment in tertiary education to be spread over the next six years. This represents increasing funding for teaching and research and provides improved indexation of Australian student funding (refer Commentary Issue 3[33] for a full discussion of indexation in higher education).[34]

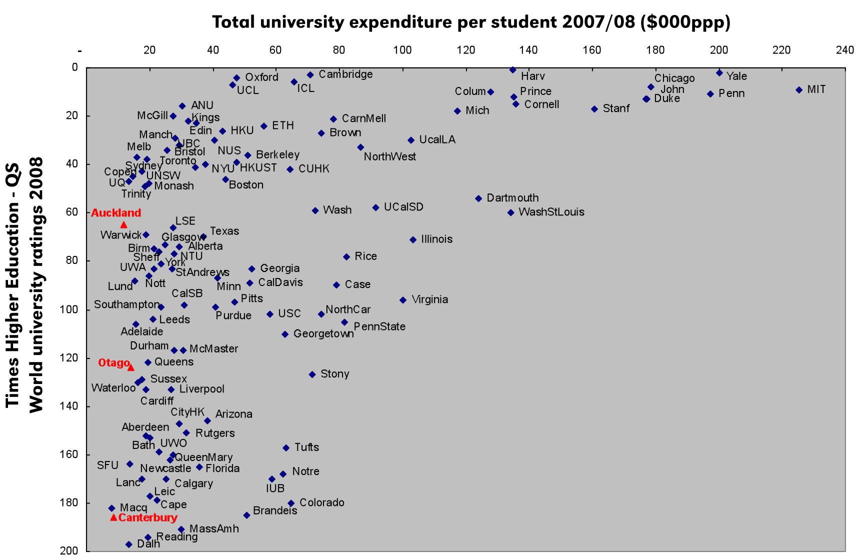
Other countries such as China, Korea and Singapore are reforming and reinvesting in their educational institutions with the express purpose of enhancing quality, increasing research capabilities, and attracting outstanding staff and students from around the world.

There can be no doubt that higher levels of investment lead to increased quality in universities. Figure 2 shows the relationship between university rankings (of those ranked in the top 200 in the world), and total university expenditure per student. The figure illustrates two important points. First, New Zealand universities do very well relative to the level of investment in them – i.e. we have one of the best 'value for money' university systems in the world. No universities have a lower level of investment per student but higher rankings than the New Zealand universities. Second, if we genuinely wish to see our universities improve, we must be prepared as a nation to invest in them since there is clearly a strongly positive relationship between level of investment per student and quality of the institution as measured by international rankings.

Table 2: Annual expenditure on educational institutions per student and average tuition fees (2006), in equivalent US$ converted using PPPs based on full-time students

Country	Annual expenditure on tertiary education per full-time equivalent student (2006)[30]	Estimated annual average tuition fees charged by publicly funded tertiary-type A educational institutions for national students (academic year 2006/2007)[31]
United States	$25,109	$5,666
United Kingdom	$15,447	n/a
Australia	$15,016	$4,035
Canada	n/a	$3,705
OECD average	$12,336	n/a
New Zealand	$9,288	$2,765

Figure 2: Top universities by 2008 world ranking and expenditure per student 2007/08[35]



Sacrificing quality for price

It is clear from this review that investment in universities generates significant private and public benefits through the added value that research and education, particularly the advanced programmes offered by universities, create for both the graduate and the community. It is also apparent that higher quality institutions create higher levels of value because of their superior researchers and teachers – which is precisely why top institutions internationally are able to command high tuition fees.

29 These five countries represented 72 of the top 100 universities in the 2009 Shanghai Jiao Tong University Academic Ranking of World Universities, and 60 of the top 100 universities in the 2009 Times Higher Education-QS World University Rankings.

30 OECD, 2009. Education at a Glance 2009: OECD indicators. Table B1.1a, p202.

31 OECD, 2009. Education at a Glance 2009: OECD indicators. Table B5.1a. p255-256.

32 2006/07 saw the introduction of a maximum standard tuition fee in England of £3,000 per annum.

33 The University of Auckland, 2007. Commentary. Issue 3, January 2008. Available online: www.auckland.ac.nz/commentary

34 The Australian Federal Government, 2009. Budget 2009-10. Available online: www.budget.gov.au/2009-10/content/glossy/education/html/education_overview_01.htm

35 Figure prepared by the Office of the Vice-Chancellor, The University of Auckland, 2009. Rankings data from Times Higher Education-QS World University Rankings 2008 (www.timeshighereducation.co.uk). Expenditure data taken from 2008 or 2007/08 annual reports of the individual universities (supplemented in some instances by institutional websites).

36 Domestic Equivalent Full Time Students (EFTS) 1991-2009. Includes College of Education EFTS of approximately 5,700 in 1991, now all integrated into the university sector. Source: annual statistics extracted from Education Counts (www.educationcounts.govt.nz).

In New Zealand, however, we continue to limit the ability of our universities to enhance quality by placing significant constraints on their revenue. Rather than following the lead of countries with internationally recognised university systems, we put a huge amount of public money into ensuring that university degrees cost students less in New Zealand (particularly when the extraordinarily generous loan scheme is taken into account) than in any other nation with a significant number of top universities. In short, this country is sacrificing quality in order to keep the price down. In doing so, we fail to realise the significant private benefits that university degrees create (which is why numbers of domestic university students have increased from 69,000 to 117,000 over the last twenty years).[36]

Unless we rebalance that investment, our university system will fall even further behind those of comparable countries. Our graduates, our economy and our communities will be the losers, because in education, as in most areas of life, low cost is no substitute for quality.

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

Commentary is produced on an occasional basis by the Office of the Vice-Chancellor at The University of Auckland, and brings together some of the research-based evidence relevant to current issues in higher education and research.

Corresponding author: Heather Kirkwood (h.kirkwood@auckland.ac.nz)

To subscribe or find out more, email: commentary@auckland.ac.nz

Commentary is also available online: www.auckland.ac.nz/commentary