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The cash nexus: how teaching funds research in Australian universities

Andrew Norton



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This report was written by Andrew Norton, Grattan Institute Higher Education Program Director, and Ittima Cherastidtham, Grattan Institute Senior Associate. James Button, Thornton McCamish, Beni Cakitaki, Gabriela D'Souza and Alice He contributed to the report.

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Overview

Many people believe that Australia should increase per-student funding for universities, whether from government sources or higher student fees. The government tried and failed to abolish caps on domestic undergraduate fees, but higher caps remain a possibility.

In theory, students could benefit from greater investment in their education. In practice, there is no guarantee that additional funding, whether private or public, would provide direct educational benefits, such as small classes or more personalised help. That's because universities have powerful incentives to spend extra money on research instead.

Although university research spending doubled in the decade to 2012, academics still want to do much more research than is currently funded. Every year thousands of academics unsuccessfully apply for research grants. Academics are much more likely to say they want more time for research than for teaching. Universities worry about their position in research-driven global university rankings.

Research expenditure statistics show that research is already supported by large surpluses from university teaching. In 2012 at least \$2 billion in university research spending could not have been financed from any source but students. Conservatively, one dollar in five spent on research comes from surpluses on teaching. This constitutes the cash nexus between teaching and research.

These teaching surpluses are achieved because teaching generally costs less than what universities earn from students. This is especially true for international students, who typically pay significantly more than domestic students.

Limited data about teaching costs makes it difficult to be precise about the financial surplus from each course that universities teach. The best information available suggests that universities earn up to \$3.2 billion more from students than they spend on teaching.

University research matters to Australia, but the evidence that it improves teaching is less clear. Much of the surplus from teaching is generated by commerce faculties, but the additional research spending is mainly in other faculties. The students paying for the additional research receive at best indirect reputational benefits. Direct spending on teaching is more likely to ensure that universities offer the courses students want at a high quality.

Given these patterns, additional funding for domestic undergraduates is likely to be spent mainly on additional research. Until we track university expenditure more carefully, we will not understand how universities spend \$11 billion in student subsidies and loans and \$6 billion in fee revenue. With better information taxpayers and students will know what they're paying for when they invest in university education. And government can then better understand what incentives will ensure universities spend any increase in teaching funding on students.

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1 Introduction

Over the last decade, Australia has significantly increased public and private spending on higher education. Surging enrolments are producing large financial surpluses on teaching. Research spending is growing rapidly. Despite this apparent prosperity, Australia's investment in higher education is regularly criticised as being too low.

This perspective has some political support. Although hoping to stabilise public outlays on higher education, the current government is open to increased private investment. In 2014 it proposed abolishing existing price caps on student contributions. These are the fees paid by domestic students in government-supported places. These students account for around 60 per cent of all enrolments in Australian universities, so this change could have substantially increased total university revenue.

After two Senate defeats, the government is backing away from abolishing controls on student contributions.¹ Debate continues around the idea of fee flexibility, the possibility of raising – rather than removing altogether – caps on student contributions. The Senate may still agree to higher maximum amounts. The Labor Party is committed to at least current per-student public funding

levels.² The question of how to organise the funding of Australia's universities is very much a live one.

Though the present system clearly has weaknesses, teaching at current quality levels is not generally under-funded. Universities already make surpluses on teaching, and use that money to support research. The main financial problem universities face is pressure to spend ever-higher amounts of money on research. This means there is no guarantee that any additional funds universities receive would benefit students directly.

Chapter 2 examines teaching surpluses. It updates previous work on teaching costs to estimate how much more universities receive in revenue than they spend on teaching for different categories of students. On a per-student basis, international students are the most profitable. Overall, Australian universities made up to \$3.2 billion of teaching surplus in 2013.

Chapter 3 looks at spending on research. It shows a dramatic increase in research spending since 2002, and examines how it was financed. While government spending on research has gone up, it cannot explain the scale of growth. After accounting for other possible sources of income, chapter 3 concludes that more than 20 per cent of research spending in 2012 must have come

¹ Birmingham (2015)

² ALP (2015). While presented as an increase in funding, it is only an increase compared to spending cuts to per-student funding rates announced in the May 2014 Budget but never implemented.

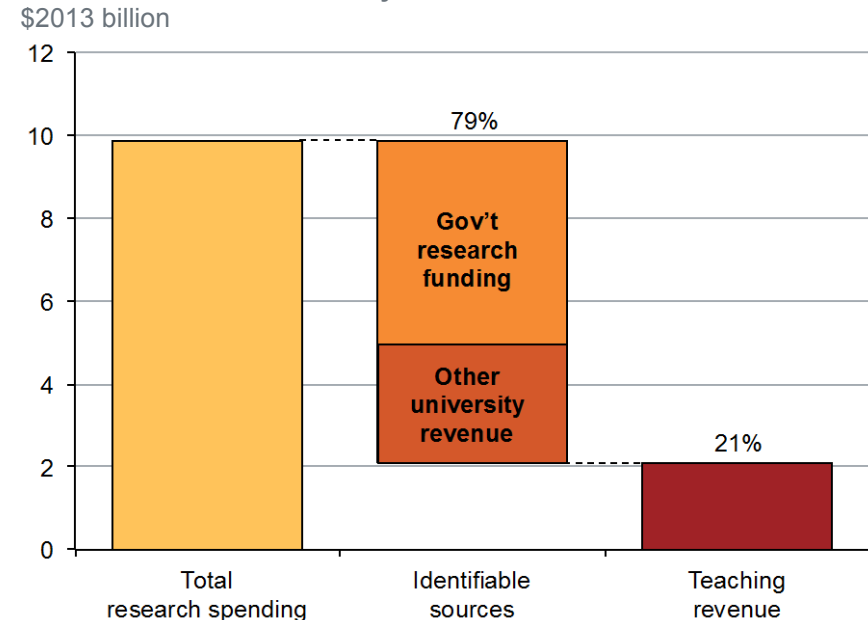
from student-related sources (Figure 1), with the true number likely to be greater than this. On a per-student basis, international students provide a disproportionate share of this money.

Chapter 4 explores the issues around per-student funding rates. While in most disciplines costs have been contained below revenue for government-supported students, there are inherent flaws in the way these funding rates are set. The system may in future fail to respond to student demand, and could suffer a decline in quality.

Chapter 4 also explains why universities generate so much money to fund research. They have existing research activities that are not self-sustaining, and must therefore draw on surpluses from other university operations. Universities have academic workforces that want to do significantly more research than current arrangements permit.

University funding reform will need mechanisms to ensure that any additional funds are used for their intended purpose. There is an ongoing debate about how best to achieve this, but more information is going to be essential. Currently university financial reporting does not distinguish between spending on teaching and research. Drawing on overseas precedent, Chapter 5 examines how reporting could be improved.

Figure 1: On conservative assumptions, teaching surpluses funded more than a fifth of university research in 2012



Notes: CPI is used to adjust for inflation. Fifty per cent of rural R&D grants are assumed to be funded by the Commonwealth government. Non-Commonwealth schemes (part of Australian competitive grants) are excluded.

Sources: ABS (2014); Department of Education and Training (various years-a); Department of Education and Training (various years-b); Department of Education and Training (various years-c); Department of Education and Training (various years-d); ABS (2015)

2 Teaching surpluses

Teaching is a core function of universities. It is the reason most were established, and is seen by the public as the most important university activity. Teaching across at least three disciplines is also a legal requirement.³

Along with its intrinsic significance, teaching is important to universities because it is one of their few activities able to deliver more revenue than it costs. Since most universities are not-for-profit organisations, they do not usually make a 'profit' in a traditional sense. Yet the difference between teaching revenue and costs – a teaching surplus – provides discretionary funds universities can use to pursue objectives, such as research, that are not financially self-sustaining at their desired level.

This chapter examines the profitability of the three main student markets: international fee-paying undergraduate and postgraduate coursework students, domestic fee-paying postgraduate coursework students and Commonwealth supported

students.⁴ In the international student category, it focuses on those studying within Australia, which is about three quarters of international enrolments.⁵ The groups are treated separately because of different policy considerations, which are discussed in more detail in chapter 4.

2.1 Teaching costs

Unfortunately, no one knows how much Australian universities spend on teaching. Unlike England or the United States, Australia does not classify university spending according to its purpose.⁶ The best published source on teaching and scholarship costs in Australia is a study commissioned by a government funding review from Deloitte Access Economics.⁷ The Deloitte study used data from eight universities with different histories and emphases. As Figure 2 suggests, cost estimates vary by discipline for both undergraduate and postgraduate coursework. Discipline differences reflect varying infrastructure requirements and teaching methods. Postgraduate courses tend to cost more to

³ In the 19th century, universities were primarily places of scholarship and teaching rather than research: Norton and Cherastidham (2014), p. 13. The legal requirements are in the threshold standards: DIICCS RTE (2013b). Disciplines refer to the broad fields of education used by the Australian Bureau of Statistics. An unpublished Universities Australia public opinion survey conducted in 2010 found that 90 per cent of respondents regarded domestic student undergraduate education as important or very important. This was slightly ahead of applied research on 88 per cent and more significantly in front of pure research on 76 per cent.

⁴ Grattan's analysis also includes undergraduate domestic fee-paying students at Bond University and University of Notre Dame.

⁵ Department of Education (2014c), section 7

⁶ Department of Education (2013); National Center for Education Statistics (2014); TRAC Development Group (2014); NACUBO (2015); National Centre for Education Statistics (2015)

⁷ Based on case studies conducted by Deloitte Access Economics (2011b). Its methodology is discussed in more detail in Appendix A: Measuring university teaching costs and surpluses.

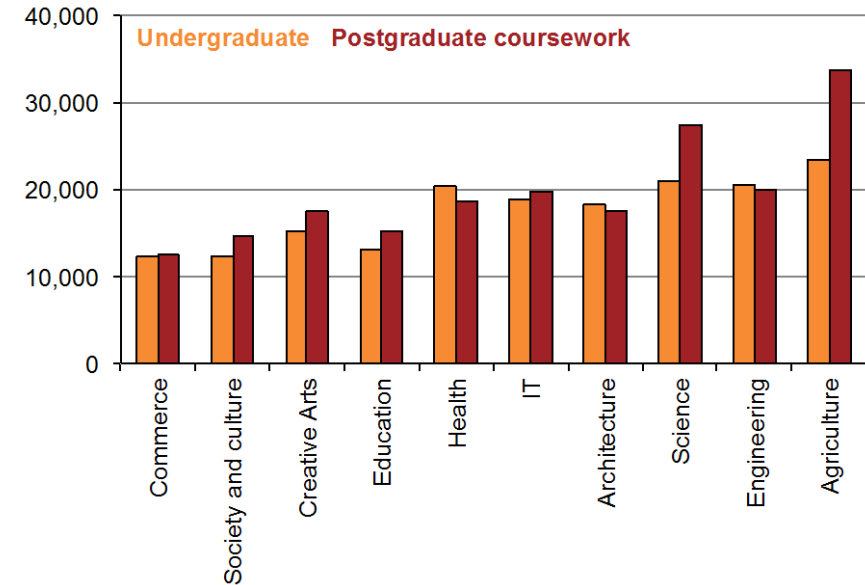
teach than undergraduate courses. Smaller class sizes and more senior staff are among the reasons for higher average costs in postgraduate courses.⁸

The Deloitte study acknowledged the difficulties involved in its analysis. As universities are multi-purpose organisations, assumptions need to be made in dividing up costs between different functions. Only in recent years have universities developed sophisticated accounting systems to provide this information. However, variations in these systems between institutions could affect the comparability of cost estimates.⁹

Since the cost study is based on data from 2010, the estimates require adjustment to reflect 2013 costs. This report uses growth in average university staff costs to adjust the study's cost estimates.¹⁰ This gives higher figures than indexing according to inflation, but is more realistic as employee benefits and costs make up nearly 60 per cent of all university expenses.¹¹

Figure 2: Annual per-student teaching costs differ across disciplines

Teaching and scholarship costs in 2014, \$2014



Notes: Annual teaching costs are for a full-time student. Original 2010 cost estimates are adjusted to 2014 values based on the growth in average university staff costs. For 2014, casual staff data is based on estimated value rather than actual value. Postgraduate coursework includes masters, postgraduate diplomas, and PhD students enrolled in Masters degree subjects. Teaching cost data here are shown only to demonstrate the overall pattern. Grattan's teaching surplus calculation is based on more granular teaching cost data for 2013.

Sources: Deloitte Access Economics (2011b); Department of Education and Training (various years-a)

⁸ Ibid. p. 49.

⁹ More detail about analysing costs is in Appendix A: Measuring university teaching costs and surpluses.

¹⁰ Based on sector-wide growth in staff costs.

¹¹ Department of Education (2014a)

The Deloitte study did not consider differences between international and domestic students. There is evidence that international students are more costly than domestic students to enrol and teach. The biggest cost difference is agent fees for recruiting international students. The Independent Commission Against Corruption (ICAC) of New South Wales found that agent commissions are typically between 10 and 15 per cent of first year international student fees – \$2200 to \$3300 for a median bachelor of commerce degree.¹² Given that most commerce degrees take three years of full-time study to complete, agent costs represent three to five per cent of the total fees paid by these students. As international students are also recruited through other sources, agent fees are a smaller proportion of total university international student fee revenue.¹³

Besides agent commissions, there are other costs uniquely or especially related to international students. The Department of Education imposes general registration charges on universities for international students.¹⁴ Universities contribute to a Tuition

Protection Service that protects international students if a higher education provider shuts down.¹⁵

International students receive tailored student support services to help them adjust to life in a new country.¹⁶ Some lecturers find international students more challenging and time-consuming than domestic students.¹⁷ If so, an international student may cost more to teach than a domestic student.

To account for their higher recruitment, regulatory, pastoral and teaching costs, the calculations in this chapter apply a loading of four per cent of international student fee revenue onto international student teaching costs.¹⁸

2.2 International undergraduate student fees and surpluses

Surpluses on international students are fee revenue less teaching costs. As the Grattan Institute background paper *University fees: what students pay in deregulated markets* explains in more detail, fees differ across disciplines and universities.¹⁹ The Deloitte study makes similar findings about costs. While we have fees data for

¹² ICAC (2015), p. 21 and Norton and Cherastidtham (2015) p. 8. In response to a Four Corners investigation, various universities in NSW and Curtin University released information on agent commissions that correspond to the ICAC's result.

¹³ In NSW, about 60 per cent of international students are recruited through agents. ICAC (2015), p. 19. This was used to estimate overall agent costs.

¹⁴ Annual cost of \$1387, a per-student charge of \$10 and a per-course charge of \$106; Department of Education and Training (2015d)

¹⁵ The costs include an administrative fee component of \$104 a year and \$2.09 per enrolment, and a base fee component of \$209 a year per institution and a \$5.23 per enrolment fee: Australian Government (2015b)

¹⁶ Andrade (2006)

¹⁷ Robertson, *et al.* (2000); Arkoudis (2006)

¹⁸ This loading is redistributed back to reduce domestic student teaching costs based on the number of students within each discipline, qualification and university. See Appendix A: Measuring university teaching costs and surpluses for details on international student costs and the adjustments made.

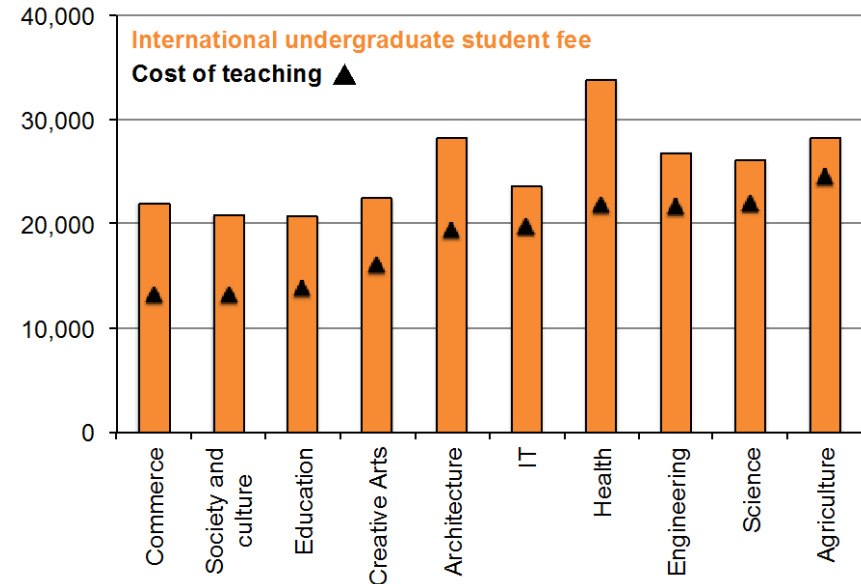
¹⁹ Norton and Cherastidtham (2015)

each university, for costs we have only a sample of universities. Our assumptions about costs affect our estimates of teaching surpluses.

One option is to look at median costs, the costs in the middle of each discipline's cost range as reported by each university. Figure 3 shows median teaching costs, including the loading for international students, and compares them with median international undergraduate fees.²⁰ The estimated median cost of teaching is shown with a black triangle, and the median fees charged are shown by the bars. Median fees substantially exceed costs in all disciplines. The margins range from about 16 per cent in agriculture to 67 per cent for commerce. For total teaching surplus, commerce is the most important discipline, as it enrolls more than half of international undergraduate students.

Assuming the median per-student teaching costs across the university system, the fees data imply that teaching international onshore undergraduates delivered a teaching surplus of about \$900 million in 2013.

Figure 3: International undergraduate tuition fees exceed costs
Median annual fees and median estimated costs in 2014, \$2014



Notes: Annual teaching costs are for a full-time student. Costs of teaching only include teaching and scholarship costs. Average increases in staff costs were used to convert costs of teaching into 2014 dollars. For 2014, casual staff data is based on estimated value rather than actual value. Teaching costs are inflated relative to the Deloitte cost study benchmark due to higher assumed costs for international students. Teaching cost data here are shown only to demonstrate the overall pattern. Grattan's teaching surplus calculation is based on more granular teaching cost data for 2013. See also Appendix A: Measuring university teaching costs and surpluses and Norton and Cherastidtham (2015), figure 3.

Sources: University websites; data supplied by Department of Education and Training Deloitte Access Economics (2011b); Department of Education and Training (various years-a)

²⁰ For more detail see footnote 18

However, using median costs may overstate teaching surpluses if high-fee students are disproportionately enrolled in high-cost universities. In Australian universities, undergraduate international students cluster in the highest-fee courses in most disciplines.²¹ In commerce, almost 40 per cent of onshore international undergraduate students choose high-fee courses and two-thirds pay more than the median fee.²²

While the Deloitte study does not specifically identify which universities have the greatest costs, research-intensive, high-fee Group of Eight universities would be in this category. The cost study found that universities with larger proportions of higher degree students had higher teaching and scholarship costs.²³ Likely Group of Eight costs may be better reflected by using mean costs, the average of all universities reporting their data. According to the Deloitte study, the mean was higher than the median in most disciplines. If we assume mean per-student teaching costs, the teaching surplus would be about \$760 million, rather than \$900 million at the median. Appendix A has more detail on the different scenarios.

Although these numbers seem high, other data sources also suggest that international students generate large surpluses. A report from the Victorian Auditor-General – which, unfortunately,

²¹ Defined as courses with fees in the top quartile when universities are ranked from most to least expensive. There is more detail in Norton and Cherastidtham (2015), p. 10.

²² See *ibid.* for the full list of disciplines.

²³ Deloitte Access Economics (2011b), p. 47

did not explain its methodology – published a chart suggesting that in 2010 the average fee charged to international students in that state was double the teaching cost.²⁴

2.3 International postgraduate student fees and surpluses

Nearly a third of international students enrol in postgraduate coursework.²⁵ These students mostly take masters degrees, with smaller numbers enrolled in graduate certificates or diplomas or doctorates by coursework.²⁶ Like their undergraduate counterparts, most of these students are in commerce courses.

And, again like their undergraduate counterparts, international postgraduates seem to prefer the more expensive universities. More than 40 per cent enrol in the highest-fee courses for commerce.²⁷ Students' preferences for the highest-fee courses are consistent across most other disciplines.²⁸

²⁴ Victorian Auditor-General (2011), p. 31

²⁵ Department of Education and Training (2015f)

²⁶ This report does not examine research degrees. While around 16,000 international students are enrolled in fee-paying research places, estimating their teaching surplus is difficult. While there is some research on this topic (Deloitte Access Economics (2011a), costs are often project-specific rather than robustly linked to particular disciplines. Also there are large numbers of university-funded scholarships, making classification of a place as fee-paying only nominal. Research student places are more part of the research than the teaching missions of universities.

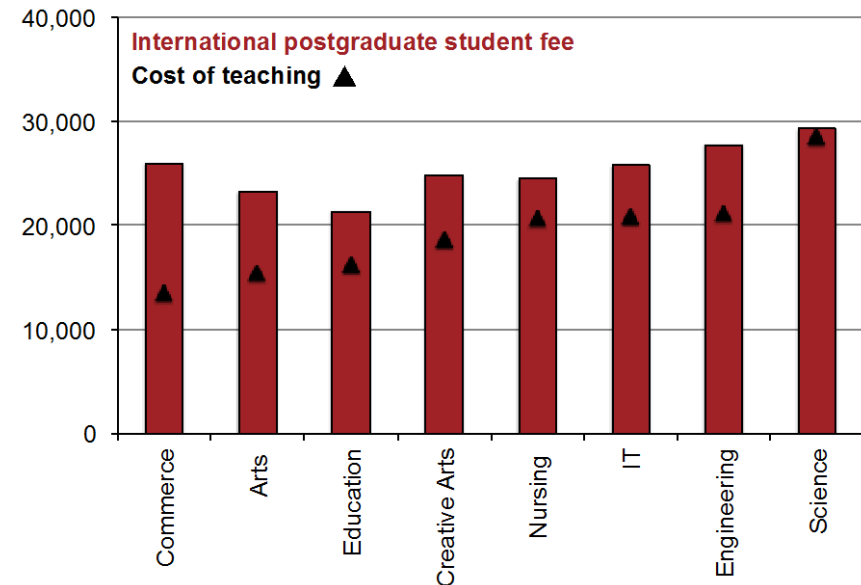
²⁷ Courses are divided into four groups from lowest-fee courses to highest-fee courses. Each group has an equal number of courses.

²⁸ More detail see Norton and Cherastidtham (2015), p. 21-23

To assess the profitability of postgraduate education, we use the same methods as for undergraduates (in section 2.2) and apply the same caveats. Estimated per-student postgraduate costs are higher than for undergraduates. Lower enrolments reduce opportunities for economies of scale, and teaching staff are more senior and experienced.²⁹ On the other hand, fees are higher too, which helps to cover the extra costs.

Figure 4 compares the estimated median cost of teaching, shown with a black triangle, and median fees charged, shown by the bars. It shows that all disciplines make money, but the level of surplus ranges widely, from a small teaching surplus in science to a large surplus in commerce. As commerce has by far the largest number of international enrolments, its margins have the greatest effect on overall profits.

Figure 4: Median per-student postgraduate international student fees significantly exceed teaching costs for most disciplines
Median annual fees and median estimated costs in 2014, \$2014



Notes: Annual teaching costs are for a full-time student. Costs of teaching only include teaching and scholarship costs. Average increases in staff costs were used to convert costs of teaching into 2014 dollars. For 2014, casual staff data is based on estimated value rather than actual value. Nursing teaching cost is based on the mean cost of teaching for nursing practice. Teaching costs are inflated relative to the Deloitte cost study benchmark due to higher assumed costs for international students. Teaching cost data here are shown only to demonstrate the overall pattern. Grattan's teaching surplus calculation is based on more granular teaching cost data for 2013. See also Appendix A: Measuring university teaching costs and surpluses and Norton and Cherastidham (2015), figure 14. Sources: See Figure 3

²⁹ Deloitte Access Economics (2011b), p. 26

Assuming median estimated teaching costs, the fees data suggests a surplus of about \$540 million for international onshore postgraduate students in 2013. Because the Group of Eight universities have strong enrolments in the critical commerce market, costs may be under-stated at the median.³⁰ As noted in section 2.2, universities with more research students tend to have higher costs. Using mean rather than median costs, to better reflect the influence of high-cost universities, produces an estimated surplus of about \$370 million.

2.4 Domestic postgraduate full-fee student fees and surpluses

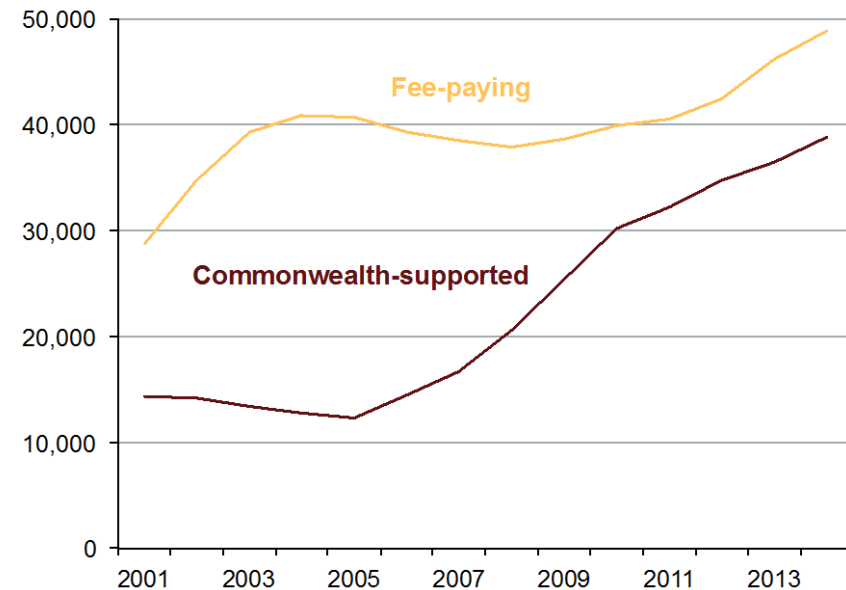
For domestic postgraduate coursework students there is a mixed market, with both full-fee places and Commonwealth-supported places (CSP). While full-fee places predominate, CSPs have grown since 2005 (Figure 5). They are most common in teaching and nursing, but are found in a variety of fields.

As in the international student market, domestic postgraduate students favour certain disciplines. While commerce does not dominate as it does for international students, it is a relatively popular field representing almost a quarter of all enrolments. Commerce together with society and culture (which includes law) accounts for nearly half of all domestic postgraduate students.³¹

How much these students pay greatly affects overall teaching surpluses.

Figure 5: For domestic postgraduate coursework, there are both full-fee and Commonwealth-supported places

Number of domestic students (EFTSLs)



Note: Includes Australian universities and Avondale College.
Source: Department of Education and Training (2015f)

³⁰ All Group of Eight universities are included in the ten universities with the highest course fees.

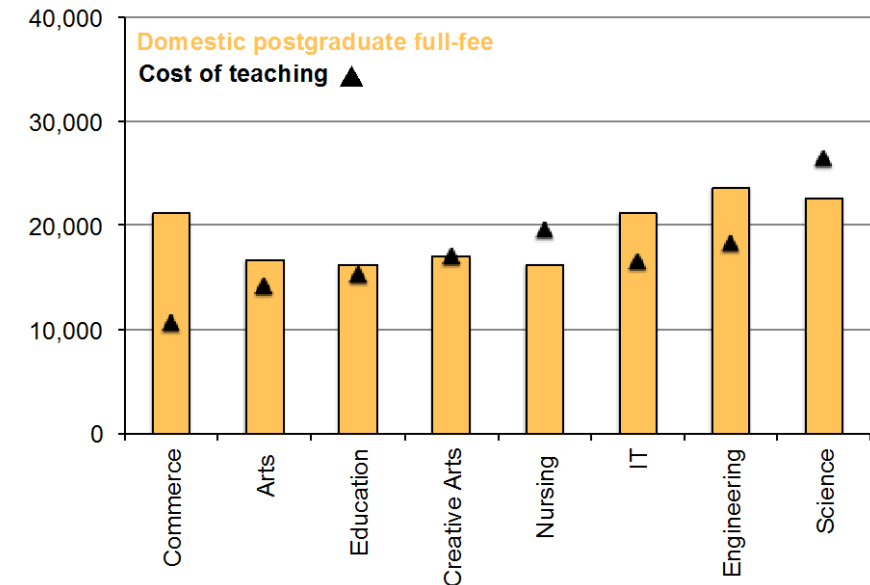
³¹ See Norton and Cherastidham (2015) p.18 for the full list of disciplines

More than 40 per cent of domestic full-fee students take the highest-fee courses in commerce, and in society and culture. However, their teaching surpluses are not as large as in the international student market. Domestic students usually pay less than international students for the same course, and never pay more. The reasons for this are discussed in the Grattan Institute background paper *University fees: what students pay in deregulated markets*.³² They include international students seeking temporary or permanent migration opportunities, and being willing to pay a large premium for university prestige.

As expected given lower fees, the gap between teaching costs and fees is smaller for domestic postgraduate coursework students than for international students. Figure 6 shows the median fees for domestic full-fee postgraduate students and the median teaching costs by discipline. In nursing and science estimated per-student costs exceed revenues. For domestic students universities recognise social obligations relating to affordability and the supply of graduates in needed disciplines. These ‘mission factors’ may explain why fees are low relative to costs in nursing.³³ There are few domestic fee-paying science postgraduates, so any losses from per-student costs exceeding revenue are likely to be small. Only commerce courses show a large teaching surplus, but this is significant given the large number of domestic postgraduate business students.

Figure 6: Teaching surpluses from domestic full-fee postgraduate coursework students are generally small

Median annual fees and median estimated costs in 2014, \$2014



Notes: Annual teaching costs are for a full-time student. Costs of teaching only include teaching and scholarship costs. Average increases in staff costs were used to convert costs of teaching into 2014 dollars. For 2014, casual staff data is based on estimated value rather than actual value. Nursing teaching cost is based on the mean cost of teaching for nursing practice. Teaching costs are deflated relative to the Deloitte cost study benchmark due to lower assumed costs for domestic students. Teaching cost data here are shown only to demonstrate the overall pattern. Grattan’s teaching surplus calculation is based on more granular teaching cost data for 2013. See also Appendix A: Measuring university teaching costs and surpluses and Norton and Cherastidham (2015), figure 14. Sources: See Figure 3

³² Ibid., p. 27-31

³³ Ibid., p. 31

Using similar methods as for the international student market, overall teaching surpluses from domestic full-fee postgraduate coursework places are estimated at \$220 million for 2013 based on median teaching cost estimates.³⁴ When average rather than median costs are assumed, overall surpluses from domestic full-fee postgraduate students reduce to about \$40 million.

2.5 Commonwealth-supported student funding rates and surpluses

Commonwealth-supported places (CSP) make up more than 60 per cent of enrolments at Australian universities. About 90 per cent of CSPs are in bachelor-degree courses. Except in medicine, there are no limits on CSP bachelor-degree student numbers. Their funding rates are very important for overall university finances, and for the effective functioning of the public university system (see section 4.1 for policy issues).

CSP public funding comes from the Commonwealth Grant Scheme: the per-student rate is called a Commonwealth contribution. Private funding comes from a student contribution, set by universities up to a maximum determined by the government. Commonwealth and student contributions vary by discipline, and together make up the total funding rate for a

³⁴ These per-student costs are deflated relative to the Deloitte cost study benchmark due to lower assumed costs for domestic students. See footnote 18.

Commonwealth supported place (equivalent to one year of study for a full-time student).³⁵

Typically, these funding rates meet or exceed current teaching costs. Figure 7 compares CSP funding rates with teaching costs for both masters- and bachelor-degree courses. University behaviour also suggests that the findings of the Deloitte data study were right: between 2009 and 2013 universities added more than 100,000 student places at these funding rates.³⁶ It is not clear why, or indeed how, they would do this if teaching costs exceeded revenues. The margins from these students have a large impact on overall teaching surpluses.

Analysis using similar methods as for the postgraduate domestic full-fee student market suggests that overall teaching surpluses from both undergraduate and masters-degree CSP students are about \$1.5 billion for 2013, based on median teaching cost estimates. While the overall gap between the median and mean costs is relatively small (9 per cent on average), in some disciplines this has a major effect on profitability. Due to the large number of CSP students, this produces a wide range of teaching surplus estimates. Assuming mean costs, rather than median, total teaching surplus reduces to about \$400 million. This includes estimated losses of nearly \$90 million on postgraduate CSP courses. Universities do use internal cross-subsidies to support courses they regard as important to their mission. However, this

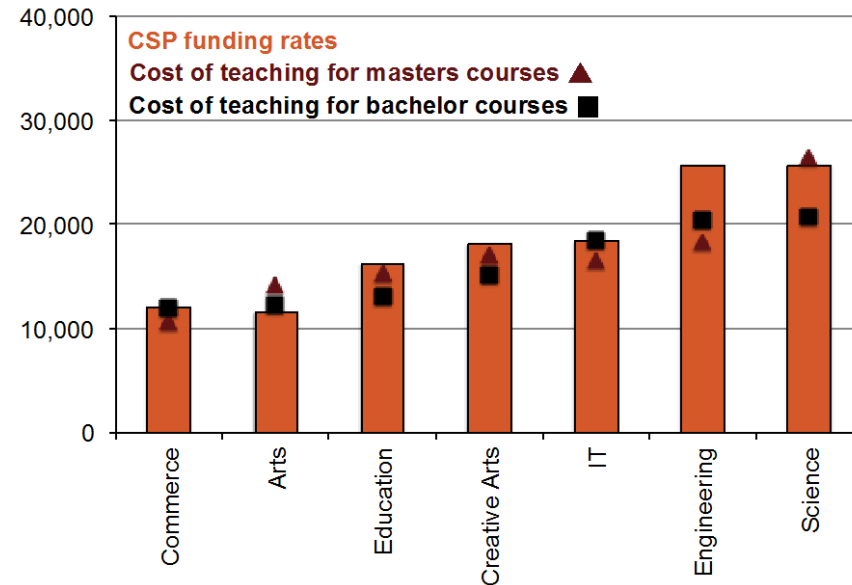
³⁵ For more detail and rates see Norton and Cherastidtham (2014), p. 43-44, 55-57. In practice, all universities charge the maximum rate.

³⁶ Department of Education and Training (2015f)

substantial loss on postgraduate CSPs may count against the plausibility of assuming mean costs for all universities.

Figure 7: CSP funding rates typically meet or exceed teaching costs

Annual CSP funding rates and median teaching costs for 2014, \$2014



Notes: CSP funding for arts is based on humanities. Teaching cost data here are shown only to demonstrate the overall pattern. Grattan's teaching surplus calculation is based on more granular teaching cost data for 2013. See also Figure 6
Sources: Kemp and Norton (2014). See also Figure 3

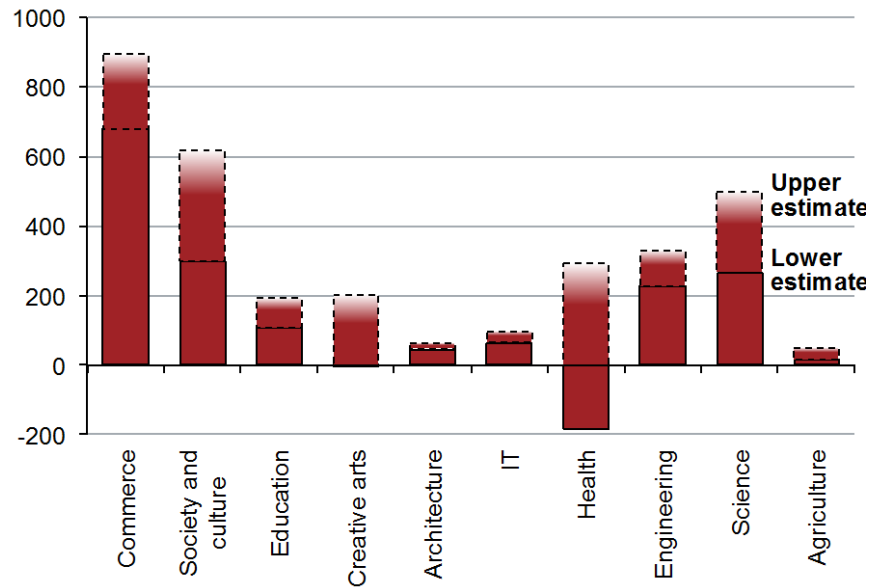
2.6 Total surpluses on teaching

As commerce courses have large per-student surpluses and high enrolments in all the fee-paying markets, unsurprisingly this discipline makes the largest contribution to overall teaching surpluses (Figure 8). This is true whether mean or median cost estimates are used, with surplus estimates ranging from nearly \$700 million to nearly \$900 million in 2013. The society and culture category delivers the second largest surpluses, with the presence of law in this ABS category a significant factor. Science makes the third largest contribution to the total estimated teaching surplus; in this case Commonwealth-supported undergraduates are able to deliver substantial surplus revenues to their universities. Health and creative arts have overall losses using mean costs. The large variety of courses within each field creates complexities in our model. However, other sources suggest that medical and veterinary science courses have funding problems.³⁷

³⁷ ACODS (2011); Lomax-Smith, *et al.* (2011); Veterinary Deans (2011); Oates and Goulston (2013). The problem is partly that historically hospitals and other medical institutions provided clinical training at much less than its actual cost. As they have become less willing or able to do so, costs have been transferred to universities. This highlights one of the difficulties of funding rates based on historical costs, see section 4.1.

Figure 8: Commerce provides the largest share of teaching surpluses

\$2013 million



Notes: Excludes food, hospitality and personal services and mixed field programs. See Appendix A: Measuring university teaching costs and surpluses
 Sources: University websites; data supplied by the Department of Education and Training; Deloitte Access Economics (2011b); DIICSRTE (2013a); Department of Education and Training (2015f)

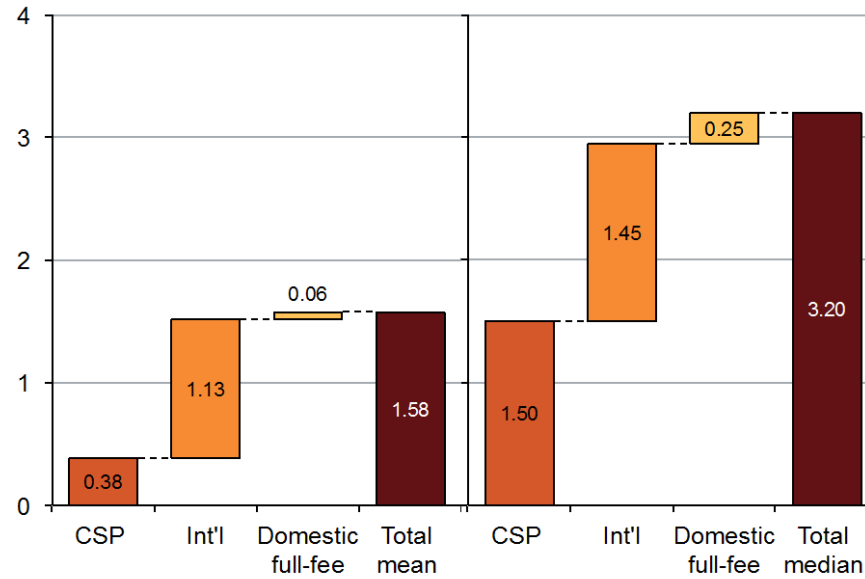
Given their numbers, international students make a disproportionate contribution to overall university teaching surpluses (Figure 9). The high fees they typically pay make the surpluses they generate robust to differing cost assumptions. Domestic full-fee students, by contrast, make a fairly small net contribution relative to the other student categories. Their overall profitability is affected by courses that appear to be loss-making.

Commonwealth-supported students are by far the largest group of students. The size of the assumed per-student surplus or loss therefore has a significant impact on their overall surplus. In the median cost scenario, they make a slightly larger contribution to total surpluses than international students. In the mean cost scenario, CSPs contribute only a third of the surplus of international students.

Overall, our estimates of surpluses on teaching in 2013 range from \$1.6 billion using mean per-student costs to \$3.2 billion using median per-student costs. Chapter 5 has recommendations for improving the accuracy of these estimates. Current data produces a large range, but on any plausible assumptions teaching delivers surpluses to the universities. The next chapter considers what universities have done with the money they make on teaching.

Figure 9: Teaching makes significant overall surpluses for universities whether mean or median costs are used

\$2013 billion



Notes: See Appendix A: Measuring university teaching costs and surpluses

Sources: See Figure 8

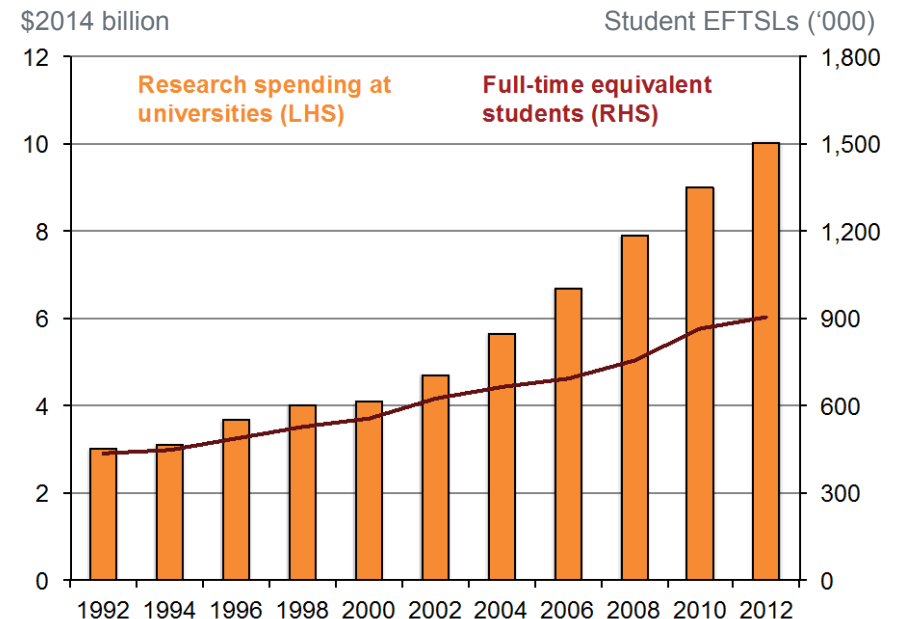
3 The contribution of teaching surpluses to research

Research is a core activity in Australian universities. To be called a ‘university’ a higher education provider must be research active in at least three disciplines.³⁸ While nearly half of research spending at universities is funded by the Commonwealth Government, universities supplement their research spending from other sources. This chapter outlines how teaching surpluses fund research spending at universities.

3.1 Research expenditure is increasing

According to Australian Bureau of Statistics (ABS) estimates, research expenditure at universities has increased dramatically since the mid-1990s (Figure 10).³⁹ It nearly doubled in real terms in just eight years from 2000 to 2008. Over the same period, student numbers increased by just over a third. Research expenditure continued its steep increase to over \$10 billion in 2012, the last year of data currently available.

Figure 10: Research expenditure has grown more quickly than student numbers



Note: CPI is used to adjust for inflation.
Sources: DETYA (2001); ABS (2014); (2015); Department of Education and Training (2015f)

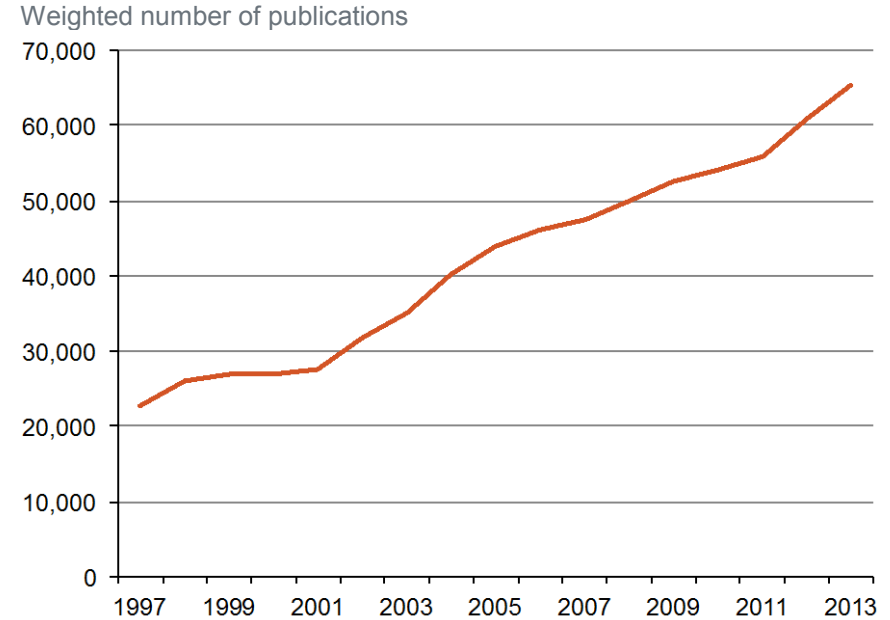
³⁸ Disciplines refer to the broad fields of education used by the ABS.

³⁹ The figures are estimates, as they involve attributing the value of staff time and overhead expenses to research, as distinct from other university activities: ABS (2013).

Research spending consumes an increasing share of university resources. At the start of the spending boom, in 2002, research salary expenditure was equivalent to 23 per cent of all university salary spending. By 2012, research salaries made up 29 per cent of all staff costs.⁴⁰

The growth in research spending seems remarkable, but it is commensurate with the growth in research output, as Figure 11 shows. Over the decade between 2002 and 2012, the weighted number of publications by university staff increased more than 90 per cent from about 32,000 to 61,000.⁴¹

Figure 11: Research publications grew at a similar rate to research expenditure



Notes: Books count for 5 points. Other types of publication count for 1 point. Universities Australia members only.

Source: Universities Australia (1995-2013)

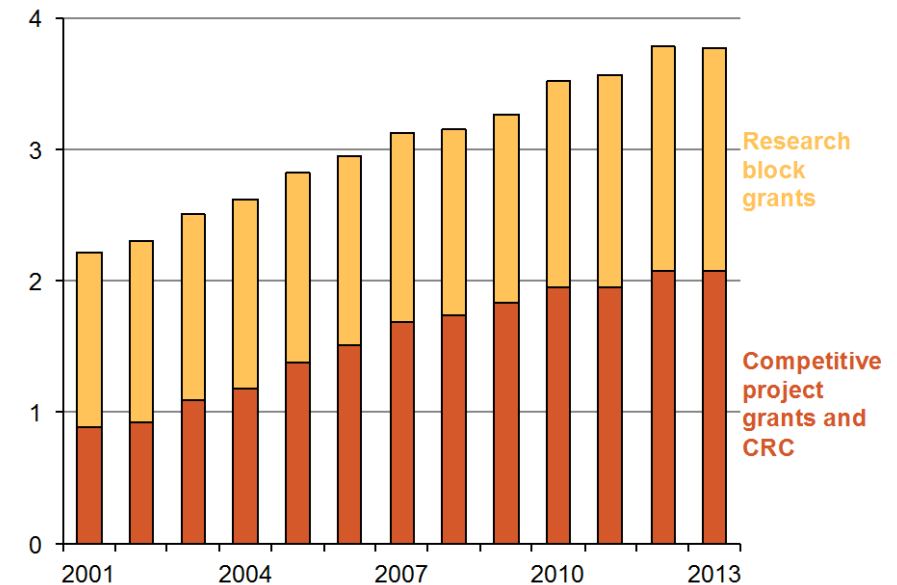
⁴⁰ Comparisons based on total research spending are complicated because ABS capital spending is reported in cash terms only. Salary data is reported on accrual basis by both the Department of Education and Training and the ABS: ABS (2014); Department of Education and Training (various years-a).

⁴¹ While some of the growth came from the increases in the number of book chapters, most of it is from increases in journal articles.

Increases in Commonwealth government research grants partially account for the growth in research spending at universities. The two main types of research grant are competitive project grants and block grants. Project grants are principally administered by the Australian Research Council and the National Health and Medical Research Council. Block grants are made on the basis of research performance, including success in winning project grants.⁴² Together, project and block grants grew by about 50 per cent in real terms over the decade between 2003 and 2013 (Figure 12).⁴³ However, as the next section will show, government spending alone cannot explain the research expenditure reported in Figure 10. To finance spending at this scale, universities must have drawn on surpluses from teaching.

Figure 12: Government research spending has significantly increased

Commonwealth government research funding, \$2014



Notes: The data includes Commonwealth competitive schemes, block grants and Cooperative Research Centre (CRC) income from the Commonwealth government. The data only includes UA members (this excludes University of Notre Dame prior to 2008, Batchelor Institute of Indigenous Tertiary Education and MCD University of Divinity). CPI was used to adjust for inflation.

Sources: Universities Australia (2014); ABS (2015)

⁴² More detail on research grants in Norton and Cherastidtham (2014) section 5.2.4

⁴³ Although state and local governments also provide some research funding to universities, their contribution is small relative to the Commonwealth government.

3.2 Student-driven funding and research

It is no secret that student-driven funding supports research in universities. Past policy expressly combined public funding for teaching and research.⁴⁴ Universities themselves say that tuition fee income supports research.⁴⁵ A funding review found that universities use income from Commonwealth-supported places to fund research.⁴⁶ In 2014 the government implicitly endorsed this practice. It proposed funding non-university higher education providers at a lower rate, because they are not obliged to conduct research.⁴⁷

While the fact that student-driven funding supports research is widely accepted, the scale of that support is not clear. The scale is important, because it goes to the issue of what students and taxpayers are getting when they pay for student places.

Given the opaque nature of university accounts, there is no definitive answer to the question of how much student funding contributes to research. A change in financial reporting requirements is needed to improve on our estimates (there is a recommendation on this in chapter 5).

In the interim, this chapter aims to identify all the possible alternative sources of funding for research other than teaching

⁴⁴ This is discussed in more detail in the next chapter.

⁴⁵ University of Sydney (2011); Hoj (2014); Johnson (2015); Universities Australia (2015a), p. 11

⁴⁶ Lomax-Smith, *et al.* (2011)

⁴⁷ Pyne (2014)

revenues.⁴⁸ Logically, whatever research spending is not accounted for by other sources must be funded out of teaching surpluses, the only major financial source available.

Our methodology starts by adding up all specific government grants for research, including those from state and local government.⁴⁹ It then calculates the total of other non-student revenue sources that may have funded research. Universities earn investment income, receive donations and royalties, conduct consultancies, provide a range of non-education services from parking to accommodation, and have various other revenue streams.⁵⁰

This analysis deliberately errs on the side of over-estimating how much these income sources contribute to research. For example, we assume that all donation and investment income is spent on research, when in reality some of this money is spent on scholarships and other non-research activities. The aim is to produce a conservative estimate of how much student-driven funding contributes to research.

⁴⁸ Other researchers have undertaken a similar analysis, with similar conclusions: Larkins (2015); Swann (2015)

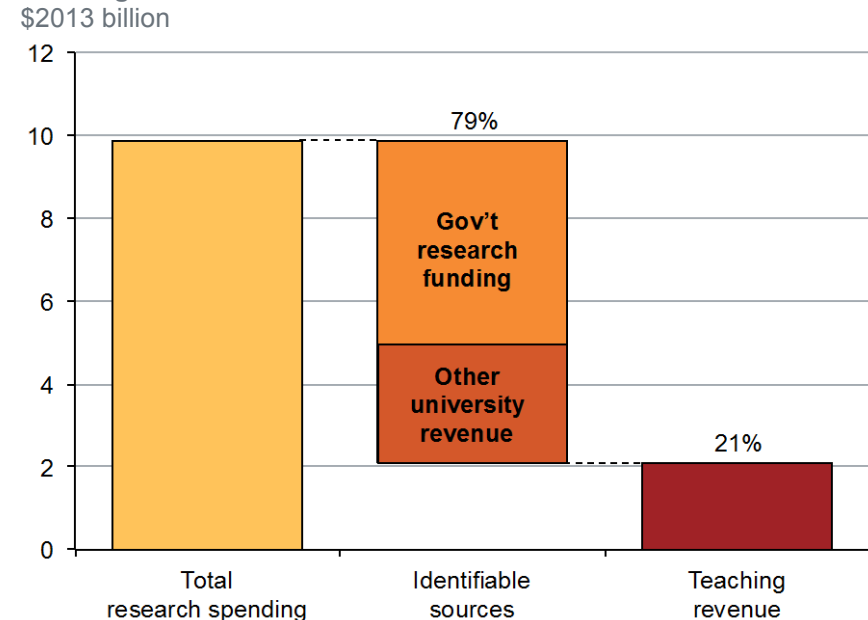
⁴⁹ While the ABS does publish revenue classified by source, its approach is not entirely suitable for our purposes. It only identifies the source of money paid to universities specifically for research, with the rest appearing as general university funds. Since this category makes up 55 per cent of all research funding sources, it needs disaggregating to estimate the contribution of student-driven funding. We use Department of Education data on university income to do this.

⁵⁰ More detail on sources is in Appendix B: Estimates of the student-driven revenue contribution to research expenditure

All potential non-student sources of research funding combined are too low to finance the research spending reported by the ABS (Figure 13). Government research programs fund about half of university research. Other non-student sources of revenue could, at most, have financed no more than another 29 per cent of university research. This leaves a minimum 21 per cent of research, or \$2.1 billion-worth, that was funded by surpluses on teaching.

These numbers are for 2012, while our teaching surplus numbers in chapter 2 are for 2013. Assuming median per student teaching costs, we estimated a total teaching surplus of \$3.2 billion in 2013. This would be more than enough to finance the likely 2013 gap between research and other non-teaching income and research expenditure. However, assuming mean per student teaching costs our estimated surplus of \$1.6 billion is too low to cover the likely 2013 research expenditure gap. This suggests that mean per-student teaching costs may over-estimate costs when applied across all universities.

Figure 13: At least \$2 billion of research spending was funded by teaching revenue in 2012



Notes: CPI is used to adjust for inflation. Fifty per cent of rural R&D grants are assumed to be funded by the Commonwealth government. Non-Commonwealth schemes (part of Australian Competitive grants) are excluded.

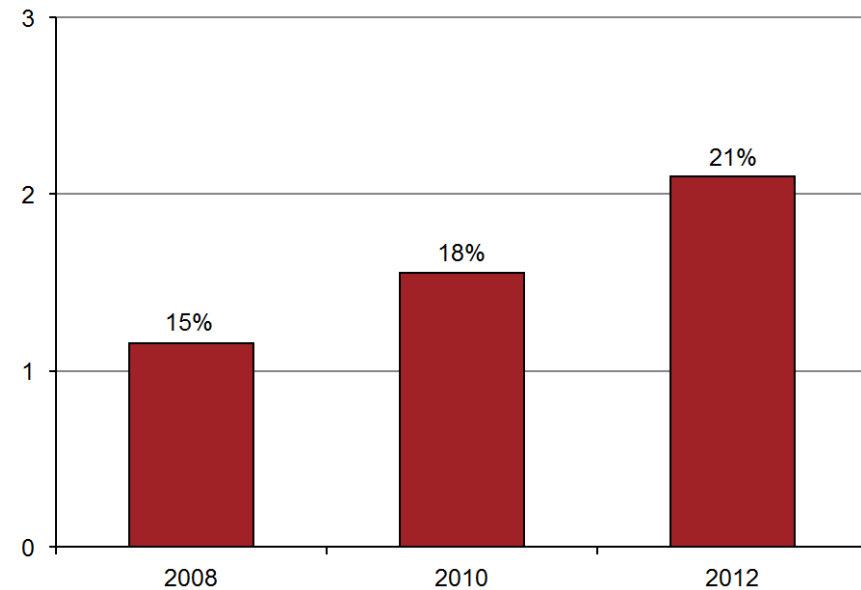
Sources: ABS (2014); Department of Education and Training (various years-a); Department of Education and Training (various years-b); Department of Education and Training (various years-c); Department of Education and Training (various years-d); ABS (2015)

When the same methodology is applied to previous ABS reports on university research expenditure, the results suggest that teaching surpluses must be playing an increasing role in financing research. The minimum discrepancy between universities' research expenditure and their non-student revenue ranges from just over \$1.2 billion in 2008 to just under \$2.1 billion in 2012 (Figure 14). This is growing proportionally as well as in absolute terms. The minimum share funded from student-related sources increased from 15 per cent to 21 per cent in the four years to 2012.

Given the methodological difficulties, we cannot say precisely how much research is financed from student-driven funding sources. Chapter 5 has recommendations for improving our estimates. But it is clear that current levels of research spending in Australian universities rely on teaching revenue. The reasons for this are discussed in the next chapter.

Figure 14: Student revenue is funding an increasing amount of research

\$2013 billion



Note: CPI is used to adjust for inflation.

Sources: See Figure 13

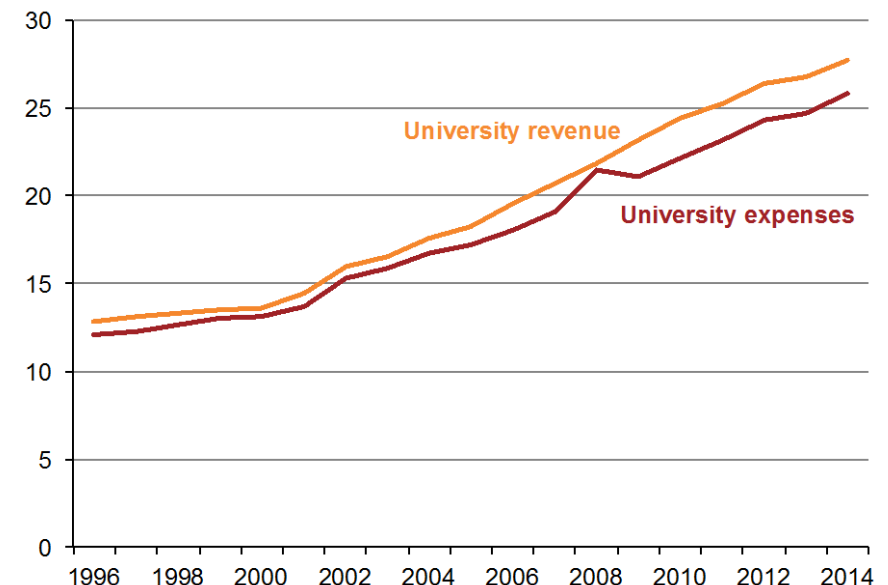
4 Student funding rates and university behaviour

Fee deregulation for student contributions is now off the political agenda. But the issue of per-student funding rates remains. Student contribution limits, or caps, could be increased rather than abolished. There is political pressure for the government to provide higher subsidies per student. Nonetheless, whoever pays for any increase in per-student funding, there is no guarantee that students would see any direct educational benefits. Teaching competes with research for funding within each university.

4.1 Problems in undergraduate student funding

There is no crisis in the funding of teaching for Commonwealth-supported places. Multiple different sources of information support this conclusion. As chapter 2 shows, current per-student rates are generally sufficient to cover teaching costs and deliver a small per-student teaching surplus. Chapter 3 produces minimum estimates of research funding from teaching exceeding \$2 billion. While the teaching surplus calculations (see Figure 9) suggest domestic and international fee-paying students could support much of this, they could not finance it all. Since 2009 universities have voluntarily enrolled large numbers of additional CSP students. This enrolment growth has not triggered financial problems. As Figure 15 shows, overall financial surpluses in this period are larger than in the preceding years. The problem is that the funding system is not designed to adapt to change and limits the kind of education that public universities can offer.

Figure 15: The public university system is not in financial trouble
\$2014 billion



Note: The increase in expenses in 2008 was due to the writing down of university investments during the global financial crisis.

Source: Department of Education and Training (various years-a)

The per-student funding rates have their origins in a 25-year-old cost study.⁵¹ There have been ad hoc changes since then, but no overall recalibration. The biggest change, implemented in 2005, allowed universities to set student contributions up to 25 per cent higher than previous HECS rates. All soon did, since universities could keep the money. But there is no in-built mechanism for increasing the funding rates other than through indexation.

In theory, indexation of funding rates can finance predictable cost changes, such as annual salary increases. But there are some changing costs that indexation cannot cover. Universities face more external requirements than they did 25 years ago. They must meet many regulatory requirements.⁵² In 2012, universities lost much of their power to set their own standards, which are now determined by the Minister for Education.⁵³ There is no policy link between these external standards and funding. In theory, ministerial decisions could significantly increase costs while holding revenue flat.

Universities also need to keep up with changing technology.⁵⁴ Technological change can *decrease* some university costs by automating routine tasks, or using simulations for instruction, or

speeding up research. But universities also add new technology to existing infrastructure and labour costs. Every student uses technology, whether enrolled on- or off-campus.

At the level of individual disciplines, per-student funding rates now need to more accurately reflect costs than they did in the past. The rates were originally used to calculate block grants – total sums of money for universities to spend on teaching and research. Discipline-level mismatch between costs and funding did not matter, so long as the total amount was enough for the university to meet its obligations. These obligations, some of which were set out in agreements with the government, determined such things as how many students the university would take.

With a few exceptions, these agreements no longer specify student numbers. In 2012 the government introduced demand-driven funding for Commonwealth-supported bachelor-degree students. Under the new arrangements the per-student funding rate is the incentive for universities to enrol domestic students. If funding rates are too low, universities may refuse to supply, even when there is demand. With total Commonwealth-supported enrolments still increasing, this is clearly not happening across the public university sector. But in some disciplines, low funding rates cause or risk under-supply relative to student or labour market demand.⁵⁵ As there is no system for regularly adjusting funding

⁵¹ Baldwin (1990)

⁵² For a survey of regulation, see PhillipsKPA (2012)

⁵³ The current standards operate until the end of 2016; DIICSRTE (2013b). From 1 January 2017, new standards apply: Department of Education and Training (2015b). The minister makes these standards on advice from a panel of people with higher education experience.

⁵⁴ New Media Consortium (2015) provides a survey of changing educational technologies.

⁵⁵ Kemp and Norton (2014), p. 73. Some postgraduate CSP places appear to be loss-making. However, the risk of under-supply is lower because universities are able to substitute full-fee places for CSPs at the postgraduate level.

for Commonwealth-supported places, these risks could spread to more disciplines over time.

Another under-supply risk is that some universities will choose international over domestic students. Not all universities expand to meet demand; some turn away well-qualified applicants to maintain a predetermined enrolment level and to maximise publicised Australian Tertiary Admission Rank (ATAR) cut-offs. With limits on total enrolments, international students typically bring in much more per-student revenue and generate greater teaching surpluses, as chapter 2 shows. Domestic students need not be loss-making for their applications to be overlooked in favour of more lucrative international students. There is no sign yet of public universities reducing domestic intakes in order to take more international students. But given universities' appetite for more discretionary revenue, it could happen.⁵⁶

The current system could also lead to a decline in teaching quality, through cost-cutting aimed at keeping expenditure equal to or below CSP rates. Universities have already reduced teaching costs by enrolling more students per academic than in the 1990s.⁵⁷ They have also saved money by increasing casual

employment limited to teaching periods, rather than taking on full-time staff.⁵⁸ In practice, technological and other changes to teaching appear to have offset any negative consequences of changes in staffing levels.⁵⁹ Student satisfaction with teaching has steadily increased from a low base.⁶⁰ Although recent trends are encouraging, future cost-cutting could adversely affect the student experience.

Universities fear Commonwealth cost-cutting. This happened repeatedly in real terms from 1995 due to the indexation system.⁶¹ Labor's final Budget in 2013 announced an 'efficiency dividend' of 2 per cent in 2014 and 1.25 per cent in 2015. This proposed cut was driven not by higher education considerations but by the Commonwealth's decision to spend more on schools.⁶² The new Coalition government pursued this saving, but it failed to win

non-teaching responsibilities. Unpublished Grattan Institute analysis weighting university staff numbers by estimated teaching capacity suggests that the ratios have been fairly stable over the last decade. However, over a 25-year period the ratios have increased.

⁵⁸ Norton and Cherastidtham (2014), p. 35

⁵⁹ On these changes, see Norton, *et al.* (2013), chapter 8; Probert (2015).

⁶⁰ Norton and Cherastidtham (2014) p. 75-77

⁶¹ The indexation system was based on a formula that was weighted 25 per cent for movements in the consumer price index and 75 per cent for movements in minimum wages. This would generally lead to annual increases of around two per cent, compared to enterprise bargaining outcomes of three per cent or more in most years. The salary component was replaced in 2012 with one linked to the wage price index for professional, scientific and technical service industry employees.

⁶² Emerson (2013)

⁵⁶ A point made by the University of Queensland: Hoj (2014)

⁵⁷ In the early 1990s, there were around 15 full-time equivalent students for every full-time equivalent academic staff member (according to Australian Vice-Chancellors' Committee statistics that are no longer accessible). In 2013, there were 21 onshore full-time equivalent students per full-time equivalent academic staff member: Department of Education and Training (2015e), appendix 5. These statistics are problematic because not all teaching staff are counted (due to outsourcing to third-party providers) and many of the staff who are counted have

Senate support for reducing Commonwealth contributions.⁶³ Despite this, political risk remains a major issue for universities.

The efficiency dividend proposal marked a turning point in higher education politics. Until then, few vice-chancellors publicly supported fee deregulation for domestic undergraduates. By the time the Abbott government announced its fee deregulation plan in May 2014, most vice-chancellors were prepared to support it. This was not because of any ideological shift. They would still have preferred government support if only it wasn't so unreliable.⁶⁴

⁶³ The efficiency dividend was however implemented for a range of other grants, including for research. This was possible because the relevant legislation sets out maximum grant funding, but not minimum grant funding. For Commonwealth contributions, the government also delayed payments of grants because of the possibility that the efficiency dividend legislation would be passed by the Parliament.

⁶⁴ Seen in the reluctant language of lobby group statements: "In the absence of growth in public investment, deregulation of student fees is needed to maintain the quality expected by students, their families, employers and the broader community": Universities Australia (2015b) p. 8; "IRU accepts a system of flexible university fees is the most realistic mechanism to provide the resources needed based on the clear evidence that Government investment will not increase to the extent required.": IRU (2015), p. 2; "RUN reiterates its position on the HERR [Higher Education Research and Reform] bill, namely that we consider that deregulation of student fees provides a way forward to provide some financial certainty to the sector for the future.": RUN (2015), p. 2; "The ATN cautiously supports the removal of the maximum student contribution amounts that providers can charge for Commonwealth supported places as a mechanism for providing sustainability to our high quality university system.": ATN (2015), p. 1. The Group of Eight notes some more positive reasons for fee

Although removing all controls on undergraduate fees is no longer seen as politically feasible, some vice-chancellors support fee flexibility, which would see student contribution caps increased rather than abolished.⁶⁵ This goes beyond managing political risk. Fee flexibility would allow public universities to offer styles of teaching that are too expensive on current funding rates. For example, public universities do not provide much small-group or highly personalised teaching. Research on student learning suggests that more engagement between students and academic staff can be valuable, especially when it creates a dynamic that encourages students to put more effort into their studies.⁶⁶

Some students are likely to see value for money in smaller classes. An American survey of university alumni found that they were much more likely to say that their education has been worth the cost if they believed their teachers cared about them as a person.⁶⁷ Some private higher education providers distinguish themselves from public universities by promoting a more personal approach, including small classes.⁶⁸ This may be one reason why

deregulation, but similarly states that "At the core of the issue is the fact that successive Governments have signalled that they cannot fund a demand driven higher education sector adequately, and there appears to be no public appetite for them to do so through the tax system." Group of Eight (2015), p. 2.

⁶⁵ Hare (2015)

⁶⁶ Arum and Roksa (2011); Norton, *et al.* (2013); Chambliss and Takacs (2014)

⁶⁷ Gallup and Purdue University (2015), p. 8

⁶⁸ For example, Bond University offers an 11 to 1 student-to-staff ratio, academics knowing the names of their students, and academics having an open door policy. Macleay College advertises maximum class sizes of 20. The

enrolments in non-university higher education providers are increasing, despite being significantly more expensive for domestic undergraduates.⁶⁹

Both fee flexibility and increased per-student public funding could, in theory, improve the current teaching funding system. They could remedy weaknesses, reduce risks, and increase quality. But in practice there is no guarantee that students would see the full benefits of increased funding. Universities would face pressures and temptations to spend any additional money on research instead.

4.2 The pressures to spend on research

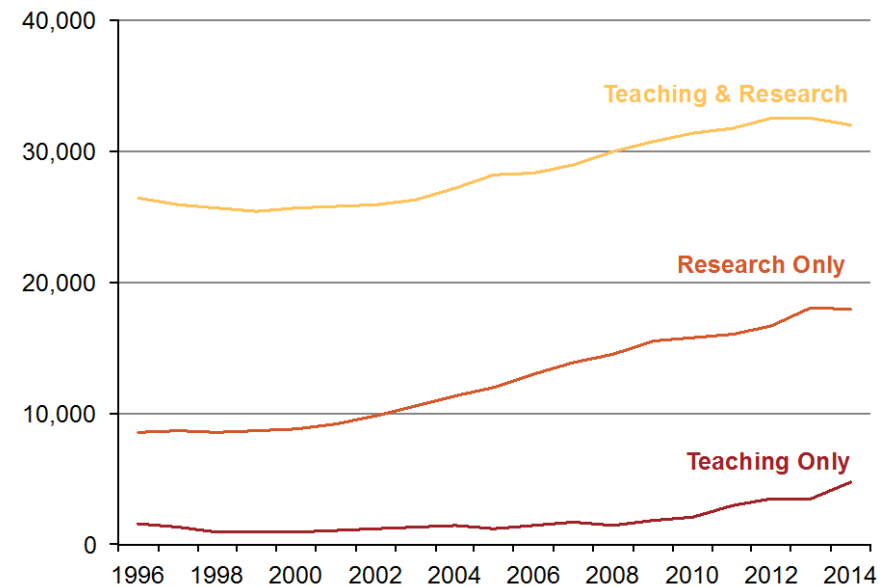
University costs are shaped by history. In the past, universities were funded by block grants for teaching and research. If student numbers increased, so too did funding for research. University employment models were built around this joint funding system. Most academic staff had teaching and research roles, and this is still the most common employment arrangement today (Figure 16). Nearly 60 per cent of academics with permanent or fixed-term appointments are employed to both teach and research.

Australian College of Applied Psychology promises small classes where students get to know each other and their teachers. These claims were sourced from provider websites.

⁶⁹ Norton and Cherastidham (2015), p. 38. However, Bond University experienced a decline in its undergraduate commencing students after 2010, possibly because the demand driven system removed public university supply constraints in Queensland.

Figure 16: Most academics are employed as both teachers and researchers

Thousands of staff (persons)



Note: Casual staff not included.

Source: Department of Education (2014b)

How academics divide their time between teaching and research is partly regulated by agreements between universities and the National Tertiary Education Union (NTEU). The NTEU works to protect research time. Precise time allocations differ between universities and individual academics, but many enterprise agreements mention the formula of 40 per cent each for teaching and research, and 20 per cent for activities such as administration and community engagement. While this time allocation lives on in industrial arrangements, it is no longer supported by government funding policy.

Set ratios of teaching and research time need funding sources that roughly move together, such as the old block grants. Over time, however, research funding was removed from grants that were originally for teaching and research, and distributed using criteria based on past research performance.⁷⁰ This broke the teaching-research funding nexus. Student numbers no longer predict research funding.⁷¹

As discussed in chapter 2, in most disciplines CSP rates still generate a surplus that can be spent on research.⁷² This money, while substantial in aggregate, cannot on its own pay more than 30,000 teaching-research academics to spend as much time on

research as they do on teaching. This funding gap shapes university behaviour on expenditure and revenue.

Trends in university employment reflect increasingly specialised funding streams. This is one reason for the rise of research-only and teaching-only academic employment (Figure 16). Most casual university employees are hired to teach during semesters only, with no research funding support for the long breaks between semesters. Despite these trends, there is still a large teaching-research workforce payroll to meet. Universities need more surpluses on teaching to fund these academics than income from CSPs can provide. These surpluses largely come from fee-paying students (chapter 2).

Another reason universities must seek discretionary revenue is that the Australian Research Council and the National Health and Medical Research Council do not cover the full cost of the projects they fund. Though block grants are intended to support these research projects, they cannot pay for all the direct and indirect costs.⁷³ This problem has become more acute over time, as project funding has increased more quickly than block funding (Figure 12). This particularly affects Group of Eight universities, the research-intensive institutions that win most of the research project funding.

⁷⁰ Norton and Cherastidham (2014), chapter 5. Research-degree completions are still in the funding formula for the Research Training Scheme, maintaining a link between postgraduate research student numbers and research funding.

⁷¹ Ibid. p. 39

⁷² Deloitte Access Economics (2011b)

⁷³ Allen Consulting Group (2009), Norton and Cherastidham (2014), p. 48-52. Larkins (2011), p 225-230. Indirect costs include the broader university infrastructure that can be used to support multiple university activities.

Even without these enterprise agreement and policy issues, the internal culture of universities creates strong pressure to increase research spending. Despite the massive recent escalation in research expenditure (Figure 10), academics still have high unmet research aspirations.

A 2011 survey found that 67 per cent of academics wanted more research time, but only 15 per cent wanted more teaching work.⁷⁴ Unmet demand for research funding is very large. For 2015, the Australian Research Council received more than 5000 applications for funding, but made fewer than 1000 grants.⁷⁵ For university applicants to the National Health and Medical Research Council, success rates were even lower. Only 14 per cent of their more than 3000 applications for funding were successful.⁷⁶

These aspirations reflect academics' high intrinsic motivation to pursue research.⁷⁷ These motivations are reinforced by university policies and practices. Australian public universities as corporate entities all use their mission statements to outline ways of improving their research. Many of them advertise their position in university rankings that are mostly driven by research performance. University planning documents specify their desired ranking position in the world's top 50, say, or the top 1 per cent of

universities worldwide. This rankings orientation is now common around the world.⁷⁸

As universities across the globe chase the same fixed number of top rankings, merely steady increases in research output and quality are not enough. To maintain its standing or move up in the world rankings, a university must improve its research more than its many competitors. This imperative reinforces the traditional bias to research over teaching in appointments and promotions.⁷⁹ Unless teaching and research complement each other, this is a problem for the student experience.

4.3 The teaching-research nexus

A common belief in universities is that there are synergies between teaching and research, often called the teaching-research nexus. According to this belief the two activities support each other: students are better off learning in a research environment, and research benefits from student input. From this perspective, there is no inherent trade-off between teaching and research. If this is true, directing student-driven funds into research may not be a major problem.

But is it true? The effects of jointly producing teaching and research have been investigated many times overseas, and a few

⁷⁴ Strachan, *et al.* (2012), p. 37

⁷⁵ ARC (2015)

⁷⁶ NHMRC (2015)

⁷⁷ Bexley, *et al.* (2011), p.13

⁷⁸ Hazelkorn (2015), especially chapter 3

⁷⁹ Bexley, *et al.* (2011), p. 24; Norton, *et al.* (2013), chapter 2

times using Australian data.⁸⁰ Empirical findings on the teaching-research nexus are equivocal. Typically, these studies find no or a weak relationship between statistical measures of research and teaching performance.

The conclusions of a Grattan paper based on Australian data were consistent with the previous literature. We compared university departments with high and low research output using questions in student surveys relating to teaching and the student experience. On most questions, student responses showed no statistically significant difference between the two groups of departments. For the questions which showed differences both high and low research departments had successes. Overall, the paper concluded that this survey evidence did not support either positive or negative generalisations about the teaching-research relationship.⁸¹

These inconclusive results do not mean that the various theories about the teaching-research relationship are false. But the positive and negative theories explaining the teaching-research relationship could cancel each other out. For instance, the opportunity to do research might attract higher calibre people to academia, but research-focused academics might spend less time on their students than academics focused on teaching. Research incorporated into the curriculum might give students inspiring

⁸⁰ Brew (2010), Zaman (2004), Trigwell (2005), Pascarella and Terenzini (2005), Marsh and Hattie (2002), Jenkins (2004), Hattie and Marsh (1996); Barrett and Milbourne (2012); Stappenbelt (2013)

⁸¹ Cherastidtham, *et al.* (2013)

access to cutting-edge knowledge, but not be the most important thing an undergraduate should know. A teaching-research nexus could be valuable in some cases but not others. Access to a research-active academic probably helps students interested in research careers, but could be irrelevant to other students.⁸²

An advantage of a tertiary sector comprising institutions with different levels of research activity is that students can choose where they study according to their own priorities. Arguably, the high fees typically paid by students at research-intensive universities reflect a market judgment on the teaching-research nexus. They suggest that students value research universities. International students especially pay a large premium to attend Australia's major research universities.⁸³

This premium is not necessarily for any personal experience of research-active staff. Commerce students contribute the largest share of teaching surpluses whether mean or median costs are used. Based on the median cost estimates, commerce contributed nearly \$900 million to the total teaching surplus but only about \$400 million was spent on commerce-related research, including government-funded projects (Figure 17). Since the ABS' fields of education do not always directly correspond to typical university faculty structures, economics is classified as part of society and

⁸² There is a summary of the different theories at *ibid.*, p. 8-9.

⁸³ Norton and Cherastidtham (2015), p. 27. In the United States, which has a much more diverse higher education system than Australia, levels of alumni belief that their education was worth the cost are very similar between research universities and other types of college or university: Gallup and Purdue University (2015), p. 6

culture. This is how our teaching surplus analysis was calculated in Chapter 2. But economics is often taught in commerce faculties. Including economics in commerce research spending would increase it to \$660 million. This is still well short of commerce’s teaching surplus. Most research spending goes to health, science, and society and culture. Only seven per cent of research spending is in economics and commerce.⁸⁴ Commerce undergraduates are unlikely to benefit directly from research conducted by academics in other faculties.

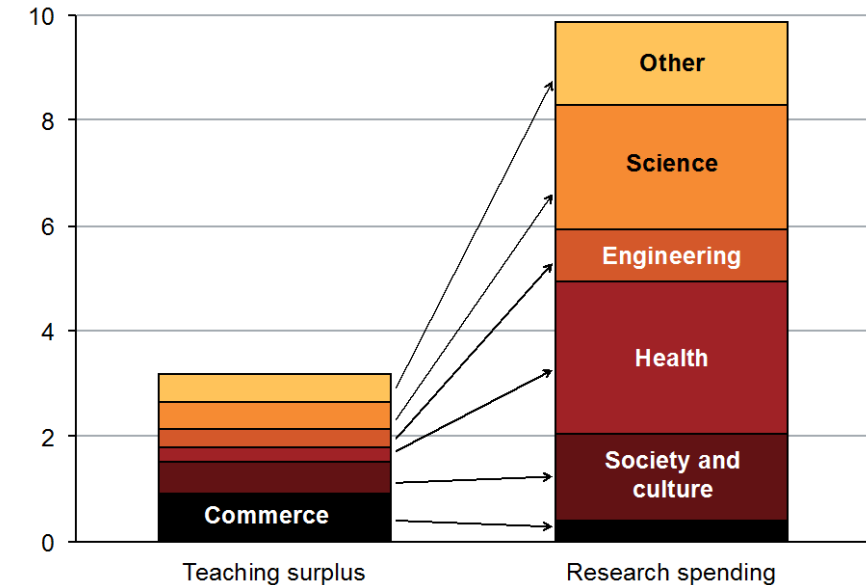
The benefits of fee-paying commerce students funding research are indirect. Attending a high-prestige university may enhance the student’s social standing, and improve their employment prospects as graduates.⁸⁵ From this perspective, whether or not there are any academic advantages from a teaching-research nexus is a minor issue. If educational benefits exist, they would be a bonus, not the main outcome students are paying for.

⁸⁴ ABS (2014), table 3.3. These fields produced 7.5 per cent of research outputs in 2010: ARC (2012), section 3.

⁸⁵ Although, in the Australian labour market at least, the benefits are not necessarily large: Carroll and Norton (2015); Norton and Cherastidtham (2014), chapter 9. We are not aware of any research into whether attending a research-intensive Australian university might offer benefits in overseas labour markets. However, this may be the case. Australian employers are likely to have experience of graduates from many Australian universities, while overseas employers may be more inclined to use proxy indicators such as university rankings. These rankings rely heavily on research performance.

Figure 17: The commerce teaching surplus exceeds commerce research spending

\$2013 billion



Notes: Teaching surplus is 2013 data, research spending is 2012 data. Teaching surplus is based on median teaching cost estimates. For 'Society and culture', weighted averages of fees and funding rates are calculated based on student enrolments by the ABS' narrow field of education when available. For research spending, 'Economics', 'Language, communication and culture', 'Psychology and cognitive sciences' are in 'Society and culture'. 'Agricultural and veterinary sciences' is in 'Agriculture'. 'Other' includes 'Education', 'Creative arts', 'Architecture', and 'Agriculture'. See also Figure 8
Sources: ABS (2014); ABS (2015). See also Figure 8

4.4 Public policy problems with the teaching-research financial nexus

When international students pay high fees they are spending private money. While they could probably get better educational value for money at cheaper universities, it is not contrary to Australia's public policy goals for them to boost Australian university research output. Alternative uses of their fee money are unlikely to benefit Australia more than their current uses.

For domestic students the issues are different. Any increase in per-student funding has consequences for taxpayers. This is most obvious when the increase is a direct subsidy. The increase would use public money that could then not be spent on other things, or require higher taxes than would otherwise be necessary.

But increases in student charges also create costs for government. This is because domestic students have access to the HELP student loan scheme. HELP offers students loans at zero real interest. It excuses low and moderate income debtors from repayment, and writes off debt on death. Interest subsidies and doubtful debt make HELP expensive. More than 20 per cent of money lent under HELP is not expected to be repaid. HELP is forecast to cost taxpayers \$2.4 billion in 2014-15.⁸⁶ If fees go up, HELP lending and costs will also increase.

With public money involved, it is important that the investment achieves public policy goals as efficiently as possible. Under

⁸⁶ Department of Education and Training (2015c), p. 49

current policy settings, funding research through students makes it harder to achieve both teaching and research funding goals.

It is not clear that teaching would be improved by increases, whether from public or private sources, in per-student funding. We cannot see how funds paid by or on behalf of students are spent. But we know that each university faces powerful internal pressures to spend additional revenues on research, and that, sector-wide, research is consuming a larger share of university resources. The campaign for fee deregulation failed in part because no convincing case was made that students would benefit.⁸⁷ The argument for more per-student public funding faces the same policy problem, even if it will get a less probing political response.

Given these issues, reforming the per-student funding system requires more than just modifying the rates. If the policy goal is to improve outcomes for students we need ways of ensuring that students do in fact benefit. These would be consumer protection measures for students investing their own money, and public accountability mechanisms for taxpayers.

The UK government has already decided to link teaching performance and the fees universities can charge students. Only universities with good results in a Teaching Excellence Framework will be allowed to increase fees beyond the current

⁸⁷ Norton (2015). A public opinion survey found that only 17 per cent of respondents believed that deregulating fees would make the university experience better: The Australia Institute (2015), p. 4

£9000 annual maximum.⁸⁸ Universities might be required to produce clear plans for improving the student experience and outcomes before being allowed to charge higher fees.⁸⁹

Universities could be asked to prove that a certain proportion of their student-driven income has, in fact, been spent on facilities and services directly relevant to students. These measures are not mentioned here as policy recommendations; just possibilities for rebalancing incentives between teaching and research.

Policymakers may decide that more public money should be spent on research as well as teaching. But if so, are Commonwealth contributions and HELP subsidies the right mechanisms for delivering it? Student-driven revenue streams let universities pursue their own research agenda. This independence has benefits, but it would not achieve the same policy objectives as the current dedicated research funding programs. All of these are awarded at least in part on past research performance, a policy intended to encourage research productivity.⁹⁰ The government has announced new research priorities that emphasise particular topics and aim to improve the

commercialisation of research.⁹¹ With their own funding sources, academics are more likely to pursue topics of personal interest.⁹²

This report does not propose abolishing any funding connection between teaching and research. Some students want to be, and should be, in a research environment. Research and teaching are too intertwined in universities to unravel them over any short time period. But policy goals in both teaching and research are likely to be better served by clarifying what money paid by or for students is for, and how it is used. Any policy response to current funding problems will also require much better information, and better ways of collecting it. The next chapter discusses how this might be achieved.

⁸⁸ Gunn (2015)

⁸⁹ While not linked directly to funding, there is precedent for universities outlining their teaching and learning strategies for the government in compacts: DIICCSRTE (2013c)

⁹⁰ The criteria are summarised at Norton and Cherastidtham (2014), p. 50-51

⁹¹ Department of Education/Department of Industry (2014); Australian Government (2015a)

⁹² One indication of this is the relative unpopularity of Australian Research Council linkage grants that require collaboration with an external, sometimes industry, partner: Norton and Cherastidtham (2014), p. 49-50

5 Transparency in university spending

Every year universities report their financial statistics. Australian universities spent nearly \$26 billion in 2014. More than 60 per cent of this – \$16.7 billion – came from the government mostly via teaching and research grants and HELP payments. Yet the government does not know how much universities spend on their core functions of teaching and research. Given the scale of public money universities receive, their accounts are short on information that is useful for accountability. This chapter describes the problems with the current system, outlines the benefits of improving it, and proposes a possible alternative.

5.1 The current system

Currently university expenditure data is categorised by expense type. This includes items like staff salaries, depreciation, equipment and advertising.⁹³ While this information describes what universities purchased, it does not identify how much money is spent on each of their core functions – teaching and research.

Since university resources are often shared between both teaching and research, apportioning expenditure between them has inherent difficulties. As we have seen, many academics are hired to teach and conduct research. Universities have varying requirements for how their staff divide their time between teaching and research. Buildings are shared by staff performing tasks

associated both with teaching and research. Many universities now have their own systems in place to divide up costs between their activities.⁹⁴ But there is no regular national reporting of expenditure on this basis.

While this data is not collected routinely, there have been ad hoc studies. In late 2010, a government review commissioned the Deloitte Access Economics study – which formed the basis of our analysis in chapter 2 – to estimate per-student teaching costs. The consultants faced considerable difficulties in doing their work. These included dealing with the different methodologies universities used to allocate costs.⁹⁵ Despite these problems, the report was helpful in understanding which disciplines might be under-funded, and the contribution made from Commonwealth and student contributions to research.

Other cost studies in recent years have focused on research rather than coursework teaching. In 2008 the government commissioned Allen Consulting to assess the funding of government research project grants. They found that the government does not cover the full cost of research projects.⁹⁶ In 2011, another Deloitte Access Economics study examined research training costs, concluding that existing funding rates do

⁹³ Department of Education and Training (2015a)

⁹⁴ A consulting firm, the Pilbara Group, specialises in advising universities on how to understand their costs more effectively.

⁹⁵ Deloitte Access Economics (2011b), p. 51-52

⁹⁶ Allen Consulting Group (2009)

not cover them in full.⁹⁷ A biennial ABS survey reports on overall university research expenditure, which we used for our analysis in chapter 3.⁹⁸

While useful contributions to policymaking, these studies do not give a complete or up-to-date picture of how universities spend their money. Given the scale of public and private funding universities receive, clearer and more regular reporting of university spending is needed. The next section describes how this could be done and outlines its benefits.

5.2 Activity-based costing

Activity-based costing would provide more useful information about how money is used than the current expense categories. It focuses on why money is spent, rather than what it is spent on. Activity-based costing was first introduced to improve how businesses measure the costs of different goods and services they produce. It is used in costing other publicly supported services, such as hospitals. A 2011 funding review suggested it be used in universities, but this was not pursued at the time.⁹⁹

In the context of universities, activity-based costing would cost teaching, research and other services. These costs could be evaluated at different levels depending on analytical needs. It could be at the institutional level or at the departmental, subject or

project level for more granular costing.¹⁰⁰ The model allows reporting of the full economic cost of university activities. This incorporates the expense of replacing assets used, rather than just current outlays and depreciation.¹⁰¹

Activity-based costing could have a number of benefits. While the idea of removing all regulation of student contributions is now off the political agenda, the question of per-student funding rates remains open (chapter 4). With an activity-based costing model, the government could make more informed funding decisions about per-student funding rates. As the unit of funding is a subject, the costing would also need to be at that level. The Deloitte study showed that the relationship between costs and revenues varies between disciplines. Any additional investment could be targeted where it is needed most.

Over time, activity-based costing could more closely reflect expected standards and outcomes rather than historical expenditure. This would alleviate the problem of revenue driving costs – that is, universities increasing or decreasing outlays to match available revenue rather than spending what is necessary or desirable.

Activity-based costing could allow for different funding rates where genuine cost differences can be shown. This may be the case

⁹⁷ Deloitte Access Economics (2011a)

⁹⁸ ABS (2014)

⁹⁹ Lomax-Smith, *et al.* (2011), p. 70-71

¹⁰⁰ Project-costing in applications for grants and contracts is already standard practice.

¹⁰¹ Depreciation costs are included in current reporting, but these tend to be below replacement cost.

between on-line and on-campus delivery.¹⁰² Regional campuses that have difficulty achieving economies of scale but meet important local needs could be given higher funding rates.¹⁰³ Universities or courses with academically disadvantaged students could be allowed lower student-to-staff ratios and higher funding rates. These are examples of how activity-based costing could be used flexibly to achieve public policy goals in a cost-efficient way.

A clear distinction between teaching and research spending would have other potential policy uses, as government tackles the problem of ensuring students benefit from funding increases (section 4.4). If the government allocated extra funds to universities for teaching, the information from activity-based costing could be used to verify that it was used for its intended purpose. This accountability mechanism would be a counter-balance to the strong pressures to spend money on research instead of teaching (section 4.2).

Distinguishing between teaching and research expenditure would provide an empirical basis for differential funding rates between those higher education providers expected to do research, and those that are teaching-only. Encouraging enrolment growth through lower-cost providers would help control overall higher education expenditure. The evidence on the teaching-research

¹⁰² This is a contentious issue as online is not always cheaper. However, with economies of scale there is scope for lower costs online: Norton, *et al.* (2013)

¹⁰³ This is separate from any funding universities might receive to engage with local and regional communities, as they are legally required to do: DIICSRTE (2013b). Historically, this was assumed to be funded from block grants. In any revised funding system, this would need to be taken into account.

nexus (section 4.3) provides no basis for thinking that students would be disadvantaged by such a trend.

Activity-based costing may also assist students in choosing between universities. Currently students do not know how much fee revenue each university spends on teaching. While some students may be happy for their fees to be spent on research, others may not. Well-publicised information about university commitment to the student experience, including levels of spending, along with the indicators available on the Quality Indicators for Learning and Teaching (QILT) website, could help students make informed decisions about their education.¹⁰⁴

For universities without their own activity-based costing, improved information from activity-based costing could help with internal decision-making and allow more precise allocation of resources to priorities. Universities could check whether prices for courses, contracts and other university services are high enough to cover costs. Universities can subsidise loss-making activities, but this should be an informed choice, not an accident of poor cost data.

While activity-based costing would provide the government, students and universities with better information, it would also create costs of its own. The system requires a detailed understanding of resource-usage information. For universities a combination of staff surveys, interviews and infrastructure space data has been used to apportion shared resources across

¹⁰⁴ The QILT website provides information on student satisfaction and outcomes: <http://www.qilt.edu.au/>

activities. Collecting this information creates costs, although these are likely to be low for universities that already have their own activity-based costing models.

In addition to running costs, there may also be setup costs. Software and other resources may need upgrading to deal with the new reporting. Staff training may also be required to implement the new system. Given that setup costs would arise from a policy change, government could provide financial assistance in the initial phase.

If necessary, participation in the national activity-based costing system could be voluntary for small institutions. Most non-university higher education providers are teaching only, so there is no need to distribute costs between teaching and research. Many of these providers have low enrolments, and the system may prove a high administrative burden. These institutions would have to weigh this against the internal benefits of better information about costs, and the potential advantages of information about their costs contributing to national policy on higher education funding.

To fully achieve its policy benefits, the government would also need to invest in activity-based costing. Something like the Higher Education Productivity and Performance Commission proposed by the Labor Party could collect and analyse activity-based

costing data.¹⁰⁵ Such a body could provide a credible source of advice to both the government and higher education providers.

5.2.1 The UK experience

There is international precedent for activity-based costing in higher education. In 1999, the UK government introduced a new costing system for higher education institutions called Transparent Approach to Costing (TRAC).¹⁰⁶ Built on the activity-based costing model, TRAC was designed to meet higher government standards for transparency and accountability for the use of public funds. It was also intended to provide management information for internal university use. TRAC requires financial data on the full economic costs of university operations, including investment in both staff and infrastructure. The adjusted costs and revenues are categorised at the departmental level by their corresponding activity: teaching, research, and other. Support services and infrastructure costs are distributed between the three activities mainly using staff time workload surveys, planning data and space usage data.¹⁰⁷

The system has progressively developed since its introduction. In 2005, TRAC full economic cost (FEC) was introduced for costing research projects. This system helped universities fully cost their individual research projects. It was introduced to limit the practice

¹⁰⁵ ALP (2015)

¹⁰⁶ Around 165 institutions in the UK, Joint Costing and Pricing Steering Group (2005)

¹⁰⁷ More detail see TRAC Development Group (2014), section 3.1.5

of universities under-investing in infrastructure and using the savings to fund more research over the short term. In response to TRAC FEC, the UK government increased research funding by over \$2 billion a year to cover a greater proportion of the full costs associated with research. While the UK government still only funds 80 per cent of the full economic cost of research projects, this represents a significant increase.¹⁰⁸

Another development, TRAC Teaching (T), was introduced in 2008 to improve understanding of teaching costs. TRAC (T) requires universities to produce subject-level costs.¹⁰⁹ TRAC (T) results allow funding for teaching to be based on real costs by institution. Although to date standard funding rates are used, these rates are informed by TRAC (T) data.

While the more granular data captured by TRAC provides benefits, there are also implementation costs. Unlike the previous reporting system, TRAC requires staff time workload and space usage data to be regularly recorded. Collecting this information and analysing it requires additional staff time and other resources. In 2013 a government-commissioned review found that TRAC's central administration cost was between \$52,000 and \$168,000 per institution.¹¹⁰ In addition, the system also requires academic staff time to complete resource allocation surveys equivalent to

two hours per staff annually (0.14 per cent of a standard academic year). The total compliance cost represents about 0.06 per cent of English higher education institutions' total income. The review concluded that the burden associated with TRAC on institutions is generally modest or low.¹¹¹ The review also recommended improvements to the reporting system.

In 2013, the Higher Education Funding Council for England (HEFCE) and Research Councils UK lifted the minimum threshold for full TRAC reporting from about \$1 to \$6 million of publicly funded research income.¹¹² The change reduced reporting requirements for up to 60 institutions. Other measures were also introduced to increase flexibility and reduce data requirements. While there is scope to further improve, the review concluded that there is no other viable modelling alternative to TRAC that would offer more benefits or a lower cost burden.¹¹³

This report is not suggesting that Australia should exactly replicate the UK's TRAC system. It simply aims to show that activity-based costing has been successfully implemented in a higher education system that shares many attributes with the Australian system.

¹⁰⁸ TRAC Development Group (2015), point 8

¹⁰⁹ See Higher Education Statistics Agency (UK) (2011) for a list of subjects used.

¹¹⁰ The range reflects the varying size of the institutions and the different uses for TRAC information, KPMG (2012) p.20

¹¹¹ In the context of wider accountability and the benefits derived: Higher Education Funding Council for England (2013), p.23

¹¹² TRAC Development Group (2015) p. 14. The threshold relates to exemption from compliance with some of the detailed TRAC requirements with the aim of reducing the administrative burden for institutions with low levels of publicly funded research.

¹¹³ Higher Education Funding Council for England (2013) p.16

5.3 Conclusion

Australia needs a more transparent system for reporting how universities spend their money. This is consistent with good general practice in government: we should be clear about our policy objectives, and have reliable ways of seeing whether these objectives are being achieved.

Any higher education reform must grapple with the fact that universities co-produce teaching and research. The two activities have tensions as well as synergies. As described in earlier chapters, there are strong internal university pressures to favour research over teaching, and much evidence that teaching surpluses are used to finance research. The cash nexus between teaching and research, in which teaching supports research, is more easily demonstrated than the academic nexus in which research is said to improve teaching. The teaching-research cash nexus means that students may not benefit directly from extra public investment in higher education, or from any additional fees they end up paying.

Activity-based costing alone will not control how universities spend their money. Section 4.4 mentions some possible more direct measures to ensure teaching gets its intended resources. But activity-based costing will give us the information necessary to determine what is happening to university income. A new costing system is not about changing the teaching and research missions of universities, just ensuring that additional research spending does not come at the expense of students.

6 Appendix A: Measuring university teaching costs and surpluses

Australian university financial reporting requirements are not designed to identify spending on teaching. Chapter 5 contains recommendations to remedy this problem. In the absence of sector-wide activity-based costing data we updated previous research to provide the estimates of teaching costs in Chapter 2. We used official government funding rates and our own database of fees to calculate revenues. The difference between the two is the teaching surplus. The steps in these calculations are listed in Box 1, and discussed in more detail below.

The best available source of data is work done for a 2011 government funding review.¹¹⁴ The work was carried out by Deloitte Access Economics, but they are in no way responsible for the use we have made of it.¹¹⁵

The Deloitte study began with 12 universities, with a range of different histories and mixes of activities. For various reasons, only eight were used in the final analysis. Each was asked to allocate academic staff costs as accurately as possible between undergraduate and postgraduate teaching, other teaching, supervised work placement, research training, research, and scholarship. The latter category can blur with research, but generally it refers to academic work that involves understanding existing knowledge rather than adding to the stock of knowledge. As scholarship is important to teaching, these costs are combined in the analysis.

¹¹⁴ Lomax-Smith, *et al.* (2011)

¹¹⁵ Deloitte Access Economics (2011b)

Box 1: Summary of steps for calculating teaching surpluses

1. Inflate the 2010 cost estimates from the Deloitte cost study to 2013 using the growth in average staff costs.
2. To account for higher costs for international students, add a loading of four per cent of international student fee revenue onto teaching cost estimates to identify international student teaching costs. Deduct an equivalent cost loading from teaching costs to find domestic teaching costs based on the proportions of international and domestic students in each discipline, qualification and university.
3. Based on a Grattan database of university fees and CSP rates, deduct the teaching cost from the annual student fee or CSP funding rate to find the teaching surplus per EFTSL by field of education, qualification and university.
4. Using the 2013 enrolment data, multiply enrolments by corresponding teaching surpluses to estimate the total teaching surplus.

Aside from the costs of academic staff, the universities provided information on support and administrative staff, and non-staff costs such as accommodation, maintenance and repair, depreciation, utilities, finance and insurance, and other costs. Accommodation costs included an estimate of the rent value of buildings, if they were not owned by the university, and imputed rent for university-owned buildings. These can be incurred at

either the department, faculty or central levels. These costs were distributed across teaching and research.

Since the Deloitte study is based on data from 2010, the estimates require adjustment to reflect 2013 costs. Staff costs account for about 60 per cent of total university expenditure. Of the itemised other expenses, the largest relates to depreciation and maintenance of university equipment and buildings, at around 10 per cent. In aggregate, staff and non-staff costs grew at a similar rate between 2010 and 2013, of 20.8 per cent and 20.3 per cent respectively in nominal terms.¹¹⁶

We updated all costs in line with average increases in staff costs, recognising that labour costs have a significant influence on overall teaching costs. Average staff costs were calculated by taking the total cost of staff wages and benefits, and dividing it by the full-time equivalent number of staff.¹¹⁷ This captures the effects of increasing staff seniority as well as general wage increases. This method more realistically captures rising costs than alternative measures such as general price inflation.

The Deloitte study does not distinguish between the teaching costs of domestic and international students. As discussed in section 2.1, international students cost more to teach and administer than their domestic counterparts. The main reason for this is the cost of agents used to recruit international students. Agent commissions are often between 10 and 15 per cent of first year international student fees. For students recruited by agents

for three-year bachelor degrees agent costs represent three to five per cent of the total fees paid. Not all students are recruited using agents. The Independent Commission Against Corruption (ICAC) found that in New South Wales about 60 per cent of international students are recruited this way.¹¹⁸ This proportion was used to estimate overall agent costs as a share of fee revenue. For a three-year bachelor degree overall, including students recruited by other methods, agent costs equate to about 1.8 to 3 per cent of total fee revenue.

There are a range of other costs associated with international students. The Department of Education imposes general registration charges on universities for international students.¹¹⁹ Universities also contribute to a Tuition Protection Service that protects international students if a higher education provider shuts down.¹²⁰ Affected students receive a tuition fee refund or help finding an alternative course. These costs amount to less than one per cent of revenue.

Additional on-campus costs from international students are harder to quantify. International students received tailored student support services to help them adjust to life in a new country.¹²¹ It is difficult to assess additional teaching costs for international students, because they are usually taught with domestic students. Some lecturers find international students more challenging and

¹¹⁶ Department of Education and Training (various years-a)

¹¹⁷ Department of Education and Training (2015f); Department of Education and Training (various years-a); including casual staff

¹¹⁸ ICAC (2015), p. 19

¹¹⁹ Annual cost of \$1387, a per-student charge of \$10 and a per-course charge of \$106; Department of Education and Training (2015d)

¹²⁰ The costs include an administrative fee component of \$104 a year and \$2.09 per enrolment, and a base fee component of \$209 a year per institution and a \$5.23 per enrolment fee: Australian Government (2015b)

¹²¹ Andrade (2006)

time-consuming than domestic students.¹²² If so, an international student may cost more to teach than a domestic student.

These additional costs associated with international students are estimated to be equivalent to four per cent of international student fee revenue. To compensate for this, international student cost estimates in this report add four per cent of international student fee revenue onto their average teaching costs. The loading is redistributed back to reduce domestic student teaching costs based on the proportions of domestic and international students in each discipline, qualification and university.¹²³ These changes have no effect on the aggregate estimate of teaching surpluses, only on the contribution made by different groups of students.

On the revenue side, Grattan collected fee data for representative courses from university websites. The data includes 41 public and private universities. While the undergraduate international student fees are based on actual 2013 fees, our data collection for postgraduate only extends back to 2014. The median growth rates in fees between 2014 and 2015 for postgraduate international and domestic full fee-paying students are used to adjust the 2014 postgraduate student fees to 2013. For Commonwealth-supported students, we used the official funding rates for 2013.

In selecting representative fee-paying courses, the most generic version of the major course in a discipline was chosen, for example 'Bachelor of Arts' rather than 'Bachelor of Arts

¹²² Robertson, *et al.* (2000); Arkoudis (2006)

¹²³ In a small number of cases, there were no international students and the domestic student rate was left unadjusted.

(International Relations)'. However, a sample of fees for these specialist courses found that in most cases their fees were identical or similar to the more generic version. For some disciplines, such as creative arts, course names across universities tend to be dissimilar. Courses that are most comparable were chosen. When a university has multiple campuses, course fees at the main campus were used. Given the possible variation of fees and courses, these fees are indicative numbers.¹²⁴

Teaching costs from the Deloitte study were reported around the broad fields of education used by the ABS. These fields do not always directly correspond to the discipline funding categories used in funding universities or necessarily to typical faculty structures. The broad field of 'society and culture' includes law and economics as well as humanities and social sciences. Medicine and nursing are both within the broad field of health, but have different funding rates and fees. In these cases, where possible, a weighted average of CSP funding rates and fees were calculated based on student enrolments. Some other minor adjustments were made in other cases where information was missing.¹²⁵

¹²⁴ Universities are obliged by regulation to give an indicative cost of course, based on subjects typically taken by students in that course. However, students are charged by subject rather than course, so actual fees paid could vary between students.

¹²⁵ Due to a lack of data, teaching costs and postgraduate course fees for 'food, hospitality and personal services' and 'mixed-field programs' are based on the teaching cost and fees of 'management and commerce' courses. Similarly undergraduate course fees for 'mixed-field programs' are also based on 'management and commerce' course fees. Because these students represent

Given the nature of our data collection, some course fees were not available, resulting in 2.2 per cent of total coursework student places being excluded. The analysis also excluded surpluses from research students and undergraduate full-fee paying domestic students at public universities.¹²⁶

Student-driven surpluses are the excess of teaching revenue above the cost of teaching. For Commonwealth-supported students the difference between total CSP rates and the corresponding teaching cost is the teaching surplus, or loss, per full-time equivalent student (known as EFTSL). For fee-paying students, the surplus or loss on teaching was the difference between a representative course fee and the teaching cost per EFTSL for each field of education and university. As noted, teaching cost estimates differed between domestic and international students.¹²⁷

The surplus revenue from teaching per EFTSL was combined with 2013 enrolment data to estimate the total teaching surplus.¹²⁸ The

less than half a per cent of non-research enrolments, the assumption does not have a significant effect on the final result.

¹²⁶ Fee or enrolment data availability issues meant that students of University of Divinity, Torrens University Australia, Carnegie Mellon University, University College London, and Batchelor Institute of Indigenous Tertiary Education were excluded from the teaching surplus analysis.

¹²⁷ An international student loading of one percentage point represents about a \$30 million reduction in the teaching surplus from international students and an equal increase in the surplus from CSPs.

¹²⁸ For onshore international students, the calculation assumed that when the data is described as '<5', the EFTSL value is 3 unless this is greater than the corresponding value for the sum of onshore and offshore international students. In which case '<5' is assumed to equal to 1 unless this is greater than the

surplus was calculated using both mean and median teaching cost scenarios (see the discussion in section 2.2). The results of the different methodologies are shown in Table 1.

Table 1: Estimated teaching surplus based on different teaching cost scenarios (\$2013 million)

Student categories	Median	Mean
<i>Undergraduate:</i>		
CSP	1,437	468
Full-fee paying domestic	29	20
International	906	763
<i>Postgraduate:</i>		
CSP	60	-87
Full-fee paying domestic	223	40
International	542	372
Total	3,198	1,575

Note: Full-fee domestic undergraduate estimates are for private universities only.

Sources: University websites; data supplied by Department of Education and Training; Deloitte Access Economics (2011b); DIICSRTE (2013a); Department of Education and Training (2015f)

corresponding value for the sum of onshore and offshore international students. In these cases the sum of onshore and offshore international student numbers was used.

7 Appendix B: Estimates of the student-driven revenue contribution to research expenditure

Table 2 shows how the contribution of student-driven revenue to research funding was calculated.

Table 2: Estimates of student-driven revenue contribution to research expenditure (\$2013 million)

Revenue categories	2008	2010	2012	Sources
<i>Higher education resources devoted to R&D</i>	7,762	8,826	9,874	ABS
Block grants, competitive grants, contracts and CRC	3,100	3,433	3,762	HERDC and RBG
Education Investment Fund and one-off capital grants	669	781	735	Finance and Higher education report
Competitive grants and contracts from state and local governments	501	436	430	HERDC
<i>Total government research funding:</i>	<i>4,270</i>	<i>4,650</i>	<i>4,927</i>	
Investment income and non-government grants (assume 100 per cent)	858	1,184	1,262	Finance
Royalties, trademarks, licenses, consultancy and contracts (assume 100 per cent)	1,095	1,055	1,144	Finance
Donations and bequests (assume 100 per cent)	234	234	291	Finance
Other revenue	874	882	871	Finance
Portion of 'other revenue' spent on research (assume 10 per cent)	87	88	87	Assumption
Other fees and charges	640	651	659	Finance
Portion of 'other fees and charges' spent on research (assume 10 per cent)	64	65	66	Assumption
<i>Total other discretionary university revenue:</i>	<i>2,339</i>	<i>2,627</i>	<i>2,850</i>	
<i>Total research funding from governments and discretionary university revenue</i>	<i>6,608</i>	<i>7,277</i>	<i>7,776</i>	
Research spending funded by students (Unaccounted research spending; higher education research spending less government-funded research and total discretionary university revenue)	1,154	1,549	2,097	

Notes: CPI is used to adjust for inflation. Fifty per cent of rural R&D grants are assumed to be funded by the Commonwealth government. Non-Commonwealth schemes (part of Australian Competitive grants) are excluded.

Sources: 1) ABS: ABS (2014), 2) Finance: Department of Education and Training (various years-a), 3) HERDC: Department of Education and Training (various years-c), 4) Higher education report: Department of Education and Training (various years-b), 5) RBG: Department of Education and Training (various years-d); ABS (2015)

8 Glossary

ABS	Australian Bureau of Statistics	FEE-HELP	HELP for full-fee students
ATAR	Australian Tertiary Admission Rank	FTE	Full-time equivalent
ARC	Australian Research Council	Group of Eight/Go8	Coalition of Australia's 'sandstone' universities
Block grant	Money paid for general research and/or teaching purposes	HECS	Higher Education Contribution Scheme
CGS	Commonwealth Grant Scheme	HECS-HELP	HELP for Commonwealth-supported students
Commonwealth contribution	The Federal Government's payment per student	HELP	Higher Education Loan Program
CPI	Consumer Price Index	IRU	Innovative Research Universities
CRC	Cooperative Research Centre	NHMRC	National Health and Medical Research Council
CSP	Commonwealth supported place	Operating grant	A block grant for teaching and research
Demand driven funding	A policy of letting public universities meet student demand for bachelor-degree places	RUN	Regional Universities Network
Doubtful debt	HELP debt not expected to be repaid	Student contribution	The amount paid by a student in a Commonwealth-supported place
EFTSL	Equivalent full-time student load		
ERA	Excellence in Research for Australia		

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