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Graduate Winners

Assessing the public and private benefits of higher education

Andrew Norton

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Overview

Most students should pay more for higher education, given how much they benefit from a degree. By the middle of this decade, tuition subsidies will cost taxpayers around $7 billion. Yet it is not clear why the public should pay. It is time for a new approach.

Graduates do well out of higher education. They have attractive jobs, above-average pay and status. They take interesting courses and enjoy student life. Given these large benefits, and with the HELP student loan scheme in place, most subsidies are for courses that students would take anyway. Benefits greatly outweigh costs for most students, and the minority of graduates who don't win through higher income never pay for their degrees, as a result of the HELP scheme. In effect, today's tuition subsidies redistribute income towards graduates, at the expense of the general public – particularly those who do not go to university.

The report proposes a new model for setting the government's contribution to the cost of higher education. The government should only pay tuition subsidies in the rare circumstances where they lead to public benefits that would not otherwise be created.

A common argument in favour of tuition subsidies is that higher education benefits the wider public. Graduates pay above-average taxes, which finance programs and services for all Australians. Higher education benefits the public in other ways, such as higher volunteering rates, more civic behaviour, and greater cultural acceptance. However, in almost all cases the public would reap these benefits anyway. Graduates are such big winners that people would study even without subsidies.

In general, governments do not subsidise public benefits where there are incentives to create them anyway. Businesses as diverse as newspapers and supermarkets provide substantial public benefits, but they are generally not subsidised because there are ample private incentives to undertake these activities.

The public benefit argument led a 2011 Federal Government review to recommend that students receive tuition subsidies matching higher education's public benefits. Yet these public benefits could be achieved at less cost to taxpayers.

Fairness considerations do not justify tuition subsidies either. With the HELP scheme in place, tuition charges do not seem to deter people from lower socioeconomic backgrounds from higher education.

Cuts to tuition subsidies could yield savings of around $3 billion in 2016-17. These savings could be reinvested in other areas such as disability or early childhood, or returned to the public through lower taxes.

Tuition subsidies should be reduced in an evolutionary way. Careful monitoring of demand and skills shortages would allow subsidies to rise again for courses that benefit the public and that students are reluctant to study because of the cost. There do not appear to be any such courses at present. In virtually every degree students perceive – and they are generally right – that they will be winners. Public money could be better spent than in subsidising them.

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1.1 Promoting the public benefit through higher education

This year the Australian public will spend $6 billion on higher education tuition subsidies. As student numbers grow, expenditure will soon reach $7 billion. But is this the best use of significant taxpayer funds?

Graduate Winners provides a framework for public spending on higher education. It sets out when public benefit or fairness considerations justify public spending.

Public benefits include higher tax revenues, graduates using their skills to assist others, and general attributes such as greater civic engagement and tolerance. In theory, government spending on higher education can create public benefits by encouraging more people into higher education, or steering students towards courses providing in-demand skills.

In practice, tuition subsidies do not necessarily achieve these goals. Tuition subsidies work by making higher education more financially attractive. However, graduates earn significantly more than people with school or vocational education. Additional incentives to take higher education courses are unnecessary.

Tuition subsidies therefore merely redistribute income to students and graduates. The general public – particularly those who do not go to university – are worse off. They forgo other government benefits or pay higher taxes, while receiving nothing additional in return.

Successive governments have increased student charges. Student contributions to higher education costs have freed up $17 billion for health and social security spending since 1997. There is scope for further savings by students paying more for their higher education.

A key objection to charging students for higher education is that it would be unfair. People from disadvantaged backgrounds already have relatively low higher education attainment. Student charges might widen the attainment gap.

Yet *Graduate Winners* shows that prior school performance, not student charges, explains differences in higher education attainment. Young people across the socioeconomic spectrum who achieve similar school results attend university at the same rates. Only when school results are more equal will university participation be more equal.

Broad access to higher education is also maintained by the HELP income-contingent student loan scheme for government-subsidised students. Students only pay for the cost of their education if their income exceeds $49,000 a year.

(Some terms in this report have a technical meaning. A glossary at the end of this report defines them. Additional detail on the public and private benefits of higher education is available in two technical papers on the Grattan website.)

1.2 Public benefits of higher education

There are two main types of higher education public benefits, financial and non-financial.

Financial public benefits are revenue increases or expenditure decreases for government. Graduates typically earn above-average incomes, on which they pay income tax. These tax revenues are then available for public benefit purposes. There may also be cost savings to the public if higher education reduces unemployment or poor health outcomes.

Non-financial public benefits come from how graduates behave compared to non-graduates. These include their willingness to volunteer or their tolerance of different groups in society. Non-financial benefits may also include reduced activities that harm others, such as crime.

Discipline-specific public benefits are activities or functions performed by graduates with specific knowledge or skills for which they are not paid or poorly paid.

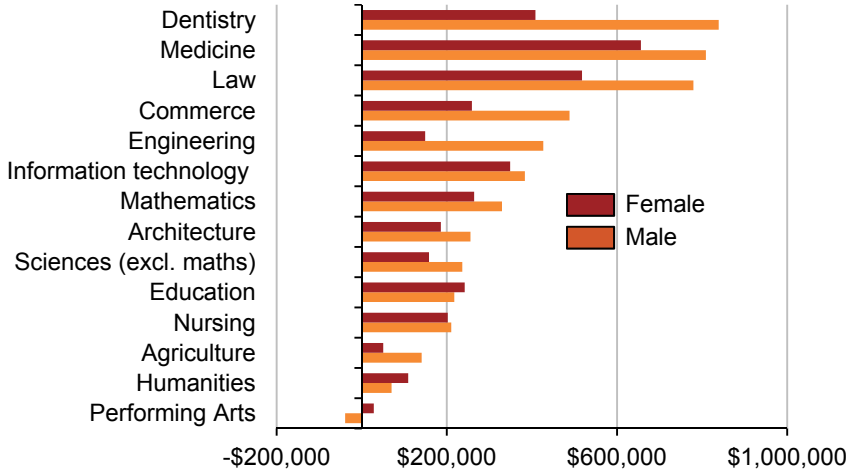
Financial public benefits

Graduate Winners calculates the additional tax paid by graduates with bachelor degrees. It focuses on bachelor degrees, because they typically receive tuition subsidies. It compares the taxes paid by a person whose highest qualification is a bachelor's degree with those paid by the median person of the same sex who finished their education at year 12. Using the 2006 Census, the median female graduate is estimated to pay around $240,000 more in tax. The median male graduate pays about $360,000 more in tax over his lifetime.

Additional tax payments vary significantly around these medians. For example, over a lifetime the median male engineer pays $480,000 more in tax. However, the median male performing arts graduate pays $10,000 less in tax.

Net public financial benefits are also calculated. These deduct tuition subsidies from the additional taxes paid. In our previous examples, the net public financial benefit of the engineering graduate drops to $425,000, and the performing arts graduate to minus $40,000. At least financially, the public would have been better off if the performing arts graduate never went to university. Net public benefits of other disciplines are shown in figure 1.

Figure 1 – Net public financial benefits (median graduates)
2006

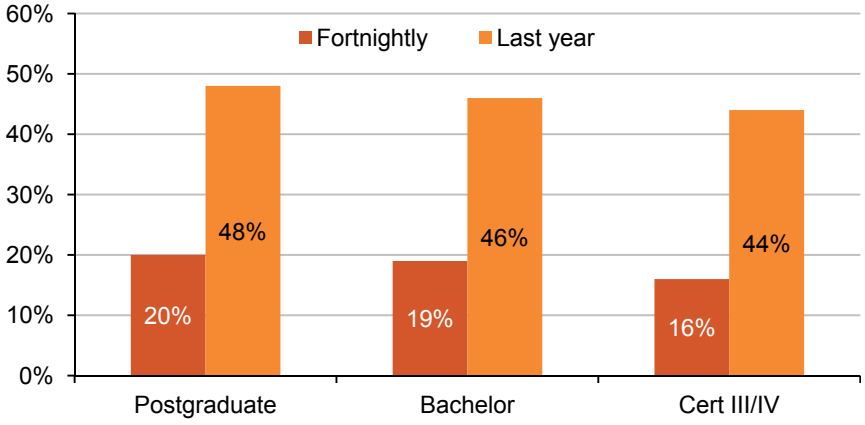


Note: *Compared to the median outcome of those who complete no study post year 12.*
Source: *Section 5.1, table 4*

Non-financial public benefits

General non-financial public benefits of higher education exist, but are not large. For example, figure 2 shows that volunteering rates for graduates are not much higher than for people with upper-level vocational certificates. In other cases, statistical techniques were used to compare graduates with similar people who do not have university degrees. This was done because a graduate's education level is only one possible influence on their thinking and behaviour. Family, religion, job and income can also affect attitudes and action. After these factors and others are taken into account, graduates do have slightly higher rates of volunteering. The increase comes primarily from people with degrees in education, social sciences, agriculture or health.

Figure 2 – Volunteering rates
Percentage of people volunteering (2010)



Source: Section 5.3.1, table 6

Similarly, overseas research finds that graduates have higher rates of civic engagement than non-graduates. This is also broadly true in Australia. However, while some differences between graduates and non-graduates may be due to their university study, most of these differences can be explained by family histories of community activity.

The same general conclusion holds for tolerance of ethnic and religious groups. Graduates are more likely than otherwise similar people to agree that it is good for society to be made up of different cultures. But when asked specific questions about people from various ethnic and religious groups, graduates differed (positively) in their acceptance levels only for people of Lebanese or Vietnamese background.

As well as general non-financial benefits, most disciplines also teach specific knowledge and skills that graduates can use to benefit others. Examples include the medical skills of university-trained doctors, or the capacity of engineers to design buildings and machinery.

1.3 Public funding and public benefits

In some circumstances markets produce less than an "optimal" amount of a good or service. Economists call this a "market failure". Assessing the optimal number and type of graduates requires considering both the public and private benefits they generate.

However, what concerns potential students most are the private benefits of higher education. If they believe that the private costs are too high relative to the private benefits, they may decide

against higher education. But where the community would have benefited from their entering higher education, their decision not to do so is a public loss. That is why government has a potential role in encouraging higher education enrolment. Tuition subsidies are one way of attracting students to higher education, or to a particular course. The impact of tuition subsidies is best explained through examples.

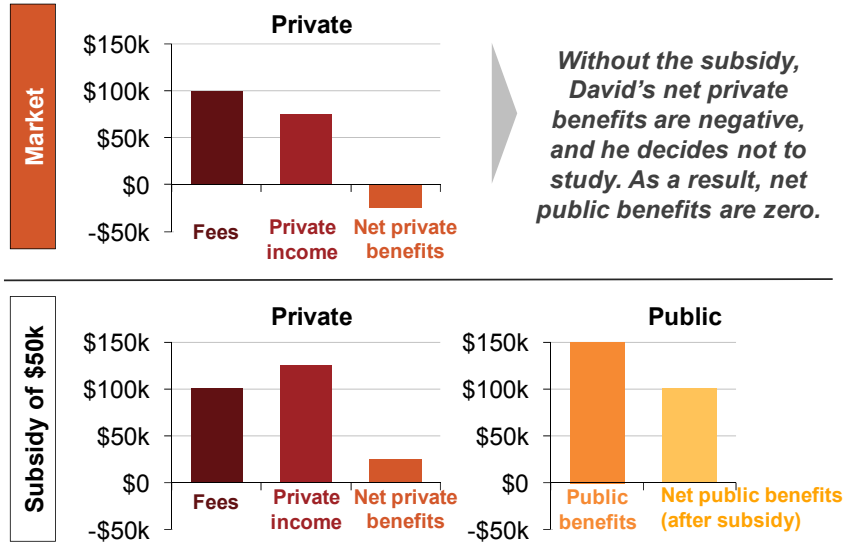
Case study 1 – David the public health student

Figure 3 sets out the higher education economics of a hypothetical prospective student called David. In a market higher education system, David faces total course fees of $100,000. With a degree, David will earn $75,000 more over his lifetime than if he finished his education at year 12. After taking course costs into account, David is $25,000 worse off than if he took no further study. He will forgo higher education. Taking only his private financial interests into account, this is his best option.

However, David had planned to study public health, and work in a related occupation with low wages. Via this work, the discipline-specific public benefits of David taking the course would be worth $150,000 in bad health outcomes avoided. A tuition subsidy of $50,000 would halve David's fees, and leave him $25,000 better off compared to entering the labour force straight after school.

Study now looks more attractive to David, and he decides to take the course. The public spends $50,000 to encourage production of public benefits worth $150,000. It gains net public benefits of $100,000 over the course of David's career. The community is better off as a result.

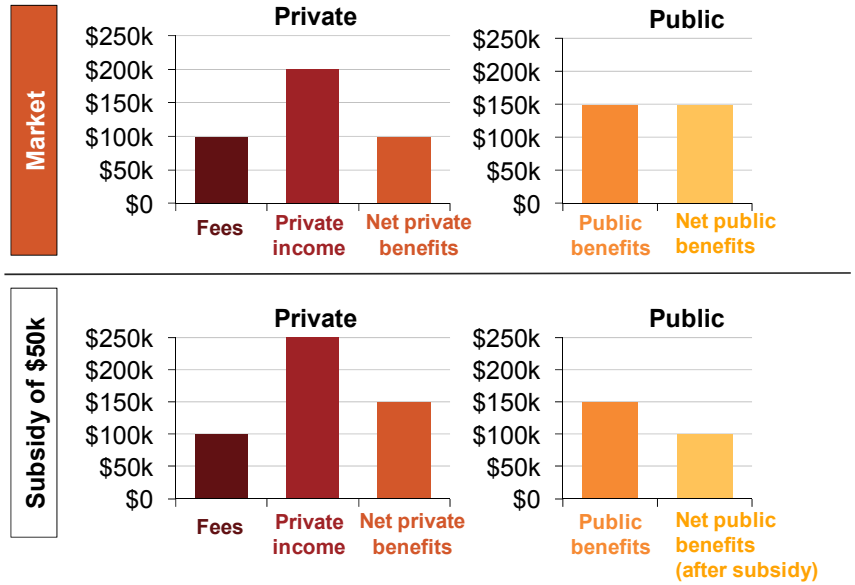
Figure 3 – Economics of higher education for "David"



Case study 2 – Emma the law student

But compare the situation of another prospective student, Emma (figure 4 over the page). Like David, she faces course costs of $100,000. But unlike David, Emma expects to receive $200,000 in private benefits over her career as a corporate lawyer. After deducting course costs, her net private benefit will be $100,000. With this significant private gain, Emma will take the course at its market price.

Figure 4 – Economics of higher education for "Emma"



Through the taxes she will pay and some volunteering work, Emma, like David, will produce public benefits worth $150,000. If she received a $50,000 tuition subsidy, it would not affect her enrolment decision. It would just increase her net private benefit from $100,000 to $150,000. The net public benefit would decrease from $150,000 to $100,000. The public is worse off if it subsidises Emma's education. The $50,000 spent on her tuition subsidy could have delivered additional public benefits in some other area. Instead, it just makes Emma more affluent than she would otherwise have been.

From a "market failure" policy perspective, the goal is to encourage the Davids while minimising subsidies to the Emmas. If this can be done, the public will come out ahead on its investment in higher education.

Setting up a policy to achieve this goal requires understanding demand for higher education. Policymakers need to know how many people are likely to be attracted to courses to know whether a tuition subsidy is necessary. Fortunately, statistics on student demand for undergraduate courses are already collected. Policymakers also need information on the private benefits of higher education. *Graduate Winners* reports past research on this topic, and adds its own contribution on higher education's private financial and non-financial benefits.

1.4 Private benefits of higher education

As with public benefits, private benefits can be financial or non-financial. Private financial benefits include increased income, and reduced risk of unemployment. Employers benefit financially from the increased productivity of graduates. Private non-financial benefits could include more interesting work, higher status, better health and increased overall life satisfaction.

How large are the private benefits?

Graduates have high rates of employment and income. The median male bachelor-degree graduate is more than $600,000 better off compared to the median year 12 completer who does no post-school study. As figure 5 shows (over the page), in most disciplines the median graduate has positive net lifetime earnings. The figure shows the additional income compared to someone of

the same sex who finished their education at year 12. Income tax, tuition costs, and the forgone earnings during the study years have been deducted from the total. In most but not all disciplines men have higher net private benefits than women.

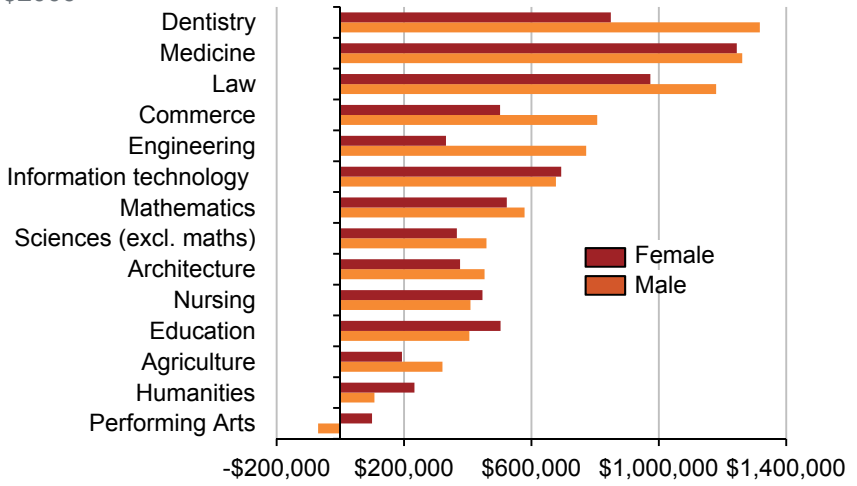
Within each discipline, some graduates earn more than others. So while most graduates do well, some do not. To measure the risk of not doing well, a "breakeven point" was calculated by discipline. This is the point at which the graduate has recovered the cost of their education, and is earning more than a person of the same sex who finished education at year 12. For example, if the breakeven point for a discipline is at the median (or 50th percentile), half the graduates are worse off, compared to someone of the same sex who left school at year 12. The most common breakeven point is around the 30th percentile. In other words, 70 per cent of graduates are obtaining additional private benefit from their degree, which is likely to attract others to study that field. These data are presented by discipline in table 9 (on page 55).

Breakeven points are worst-case scenarios for graduates. The data source of the census gives us only a snapshot in time. Many people on lower incomes at the time of the 2006 census would have earned more in the past, and will earn more in the future. But a high breakeven point indicates a high risk of at least a temporary poor financial outcome.

Though a higher future income is important to many students, money is not the only reason for study. Humanities or performing arts graduates tend to earn much less than other graduates. Yet humanities and performing arts are popular course choices. Many students with the school results to take courses with lower-risk and more-remunerative career paths choose the arts. The reason is that students follow their interests. Though job prospects are important, interest is the most frequent reason students give for their course choices. In a survey of year 12 students, 96 per cent put interest in their field of study as an important reason for their course choice. Though for many students higher education is an investment, it is also an end in itself. Students like to pursue their interests, and often enjoy their university years.

Given that these financial and non-financial private benefits are substantial, supporters of tuition subsidies need to explain why the public money would not be better spent elsewhere.

Figure 5 – Net private financial benefits (median graduates)
$2006



Note: *Compared to the median outcome of those who complete no study post year 12.*
Source: *Grattan calculations based on ABS Census 2006*

Private benefits and tuition subsidies

Tuition subsidies work by changing net private benefits, as seen in the David example. Without a subsidy David loses money; with it he makes money. However, because interests are important to course choices, financial incentives can only do so much. Money can change minds only for some prospective students – mainly those whose interests overlap with the course policymakers are trying to promote. If David was interested in accounting, a public health subsidy would be unlikely to change his mind.

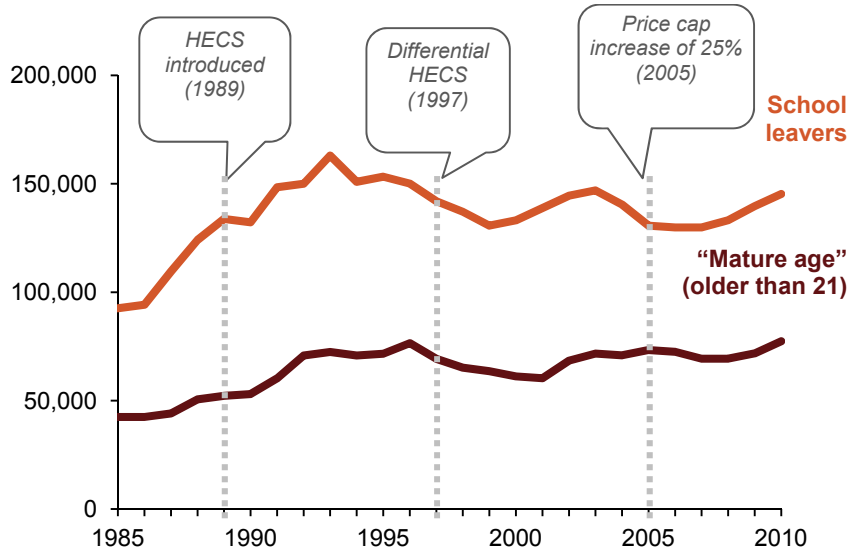
The David example illustrates how tuition subsidies could change private decisions for public benefit. But in the real world, David-like situations are not common. This can be seen by comparing a series of different student charges: free higher education, 2006 student contributions (previously called HECS), the full funding rate for a Commonwealth-supported student, and the average international student fee. In each case, the breakeven point was calculated – the point at which graduates start to benefit financially, compared to someone who finished school at year 12.

Across these widely different student-charge scenarios, the breakeven point changed only slightly. This is because student charges are a small percentage of total lifetime earnings, even at the relatively high fee levels of international students. So student charge levels should have only a modest effect on higher education demand and course choices.

Several times over the last 23 years, student contributions have changed. In theory, this lets us see what effect course prices have on student demand. Unfortunately, drawing robust conclusions from these experiences is difficult. Demand for higher education tends to fluctuate with the number of school leavers and the labour market. At the time of two of the three major changes demand was already trending down (see figure 6). Sometimes a course's demand and its student contribution increased in the same year.

Though demand for subsidised higher education places has fluctuated, until very recently demand for full-fee places grew consistently. Before 2011, numbers of full-fee students had grown continually since the 1980s. But at nearly 40 per cent of the Australian higher education market, full-fee payers still tell us much about willingness to pay for higher education.

Figure 6 – Applications over time



Source: Vice Chancellors' Committee Report, in Deloitte Access Economics (2011c)

1.5 Fairness for people from low socio-economic backgrounds

University enrolment varies with social background. Young adults whose parents are managers and professionals are three times more likely to go to university than their peers whose parents are machinery operators or labourers. A policy question is whether student charges explain these differences.

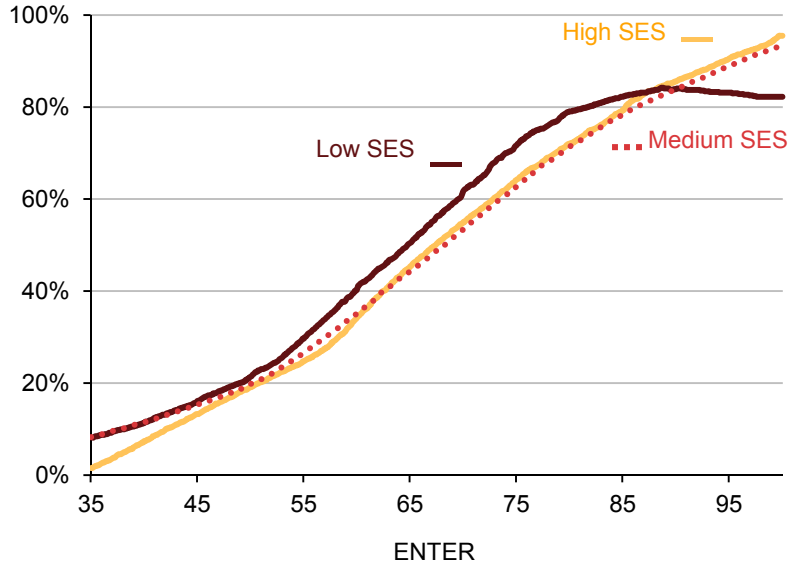
Many people, including leading figures in the current Commonwealth Government, believe that reducing student charges through tuition subsidies opens higher education to people from low socio-economic status (SES) backgrounds.

They are right that up-front tuition fees would exclude low SES students. In Australia, however, the HELP student loan scheme equalises capacity to pay across the SES spectrum. There is no credit check, and no repayments are required on annual incomes of less than $49,000. So for people on low incomes, higher education is free. Students on low incomes are also entitled to Youth Allowance, a student income support program.

What drives SES differences in university enrolment is prior school performance. The study from which figure 7 is taken shows that at each rank of school academic performance, rates of university attendance are very similar across low, middle and high SES groups. It appears that judgments about the costs and benefits of higher education differ little across the SES spectrum.

More research is needed to confirm this apparently powerful link to school results. However, other sources show that low SES students, on average, are less likely than high SES students to finish school. If they do finish school, they receive much lower average marks. Since universities select on past academic results, low SES students are inevitably "under-represented". Governments are trying to improve early childhood and school education. Until there is success in these areas, SES differences in university participation will persist.

Figure 7 – University participation by school results
% of SES group going on to higher education



Note: *"ENTER" is an age cohort school results ranking. So for example, students with an ENTER of 95 or above are in the top 5% of their year. The apparent levelling off in low SES participation above an ENTER of 80 may not be real. Few low SES students receive results at this level, so the decisions of a small number of people in the survey sample could skew the results.*

Source: *Cardak and Ryan (2006)*

1.6 Policy implications

Current tuition studies have emerged from decades of ad hoc decisions. Because the rationale for these subsidies is unclear, they are criticised for being unfair. On the analysis in this report, they are also too high. Many students – like our hypothetical Emma – are paid to take courses they would take anyway. Billions of dollars that could be spent on other government programs, or returned to taxpayers, are instead redistributed to students and graduates.

A new framework for funding higher education

Graduate Winners sets out a systematic framework for setting tuition subsidies. It will help policymakers decide when a subsidy should be paid, and how much. It applies a net public benefit test.

The first step in the framework is to ask whether there are significant public benefits from the course. This could be in additional tax revenues, the supply of skills needed in Australian society, or more general attributes of graduates (though on current evidence, this last ground is unlikely to apply). Public benefits need not be financial.

The second step is to ask whether net private benefits are generally large. High graduate incomes are one important sign of large private benefits. But private non-financial benefits need to be also taken into account. Where private benefits are large, there are already strong incentives to take a course. Further increasing private benefits through tuition subsidies is unlikely to make a large difference to student numbers.

The third step is to examine whether the number of graduates is low compared to public needs. Skills shortages in specific occupations are one measure of whether this criterion is met. With limited taxpayer resources, there is little advantage in producing graduates who cannot find appropriate work.

The fourth and final step is to apply a fairness test. Though evidence to date suggests that low SES students are not disadvantaged by tuition fees, this empirical finding should be reviewed regularly. *Graduate Winners* also considers fairness arguments for students in courses that lead to professions with relatively low pay. This issue is open to different judgments about how to value and pay for their work. However, this report does not identify a compelling case for tuition subsidies on these grounds.

Graduate Winners takes a small sample of disciplines – engineering, nursing and performing arts – through the public funding framework it proposes. A comprehensive analysis of all disciplines is needed to implement the framework. The report also favours an evolutionary approach to changing tuition subsidies. From knowledge of past demand and private benefits, reactions to different fee levels can be estimated. However, the test is student behaviour. A gradual approach to changing tuition subsidies allows for policy change, should outcomes differ from expectations.

If a phase-down in tuition subsidies started in the 2013-14 financial year, annual savings of nearly $3 billion could be possible by 2016-17.

This would not be a cut to university funding. Universities would be allowed to increase their student charges to cover any loss.

Though students would pay more, the increase would be a small proportion of their lifetime private financial benefits.

1.7 The politics of higher education reform

The conclusions of *Graduate Winners* are counter-intuitive. Higher education tuition subsidies are long established and expected. However, the assumptions behind tuition subsidies have been challenged by experience.

A large full-fee market has brought into question the idea that tuition subsidies are essential. Income-contingent loans have shown themselves capable of dealing with access obstacles. People from low socioeconomic status backgrounds have shown themselves willing to pursue higher education, if they do well enough in year 12. School results, rather than tuition charges, are the key to improved higher education attainment.

Graduate Winners uses the experience of recent decades to take us back to first principles. How should Australia design a higher education funding system, given what we now know? The public funding framework set out in this report ensures that the public receives benefits from its higher education investment, without unnecessary redistribution of income and wealth to students and graduates, and without higher education putting preventable burdens on government budgets.

2. Who pays now?

In all OECD countries a mix of public and private expenditure finances higher education.[1] Australia is in a cluster of countries with high private spending and relatively low public expenditure, as a proportion of GDP. Some European countries have low private spending, with higher education largely financed from tax revenues. Australia adopted the European model from the mid-1970s to the late 1980s. Since then, policy has largely favoured private investment.

2.1 Commonwealth-supported students

Most students studying at Australian higher education providers are in "Commonwealth-supported places" (CSPs), formerly called HECS places.[2] Almost all domestic undergraduates at Australia's public universities are in CSPs. For each CSP, the university receives a subsidy from the Commonwealth Government. Subsidy levels depend on field of study, as shown in table 1. These are called "Commonwealth contributions". In addition, the university can charge a "student contribution" up to a maximum set by the government. In practice, universities almost always charge the maximum amount. Adding the Commonwealth and student contributions together gives the total funding rate received by universities. Table 1 shows the rates for 2012. Students can borrow the student contribution through the HECS-HELP student loan scheme. They do not need to repay their debt if their income is too low. In 2012-13 the threshold for repayment is $49,000. More detail on subsidies for CSPs and on the HELP loan scheme is available in *Mapping Australian higher education*, a Grattan Institute report released in early 2012.

Table 1 – Annual funding rate for Commonwealth supported places (2012; student taking out HELP loan)

	Student	Govt.	**Total funding rate**	% public contribution
Mathematics, statistics	$4,520	$12,641	**$17,161**	74%
Science	$4,520	$19,482	**$24,002**	81%
Humanities	$5,648	$5,168	**$10,816**	48%
Behavioural science, social studies	$5,648	$9,142	**$14,790**	62%
Education	$5,648	$9,512	**$15,160**	63%
Clinical psychology, allied health, foreign languages, visual and performing arts	$5,648	$11,243	**$16,891**	67%
Nursing	$5,648	$12,552	**$18,200**	69%
Computing, built environment, other health	$8,050	$9,142	**$17,192**	53%
Engineering, surveying	$8,050	$15,983	**$24,033**	67%
Agriculture	$8,050	$20,284	**$28,334**	72%
Law, accounting, economics, commerce	$9,425	$1,861	**$11,286**	16%
Medicine, dentistry, veterinary science	$9,425	$20,284	**$29,709**	68%

Note: *If students pay up-front they get a 10% discount. The government pays the value of the discount to the student's university. In these cases, the government share of total contributions is larger than shown in this table.*
Source: *DEEWR (2012a)*

[1] OECD (2011), p 231
[2] The terminology changed in 2005. While "HECS places" remains in wide use, the official language lets us distinguish between the student charge (student contribution) and the loan scheme (HECS-HELP), and the various other loan schemes that are now available.

On average taxpayers will nominally incur about 60% of the cost of educating CSP students, and students will pay the remaining 40%. But as not all students will repay their HECS-HELP debt, the final cost to taxpayers is likely to be around 67% of total CSP funding.[3] As can be seen from table 1, the percentage of the total funding rate paid by the public varies by discipline.

2.1.1 How is the public contribution determined?

In 1974, the Commonwealth Government took full control of higher education tuition funding from the States and universities. As a condition of receiving Commonwealth funding, universities were prohibited from charging their own tuition fees, including for international students. In this period, the public contribution was equal to the overall funding rate. There was no private contribution from students.

For some student places, public contributions were subsequently abolished (section 2.2). However, for Commonwealth supported places the Government still controls the total funding rate and the division between public and private contributions. The total funding rate per discipline is based on a review of higher education funding carried out more than 20 years ago. While ad hoc policy changes have since affected funding rates, there is no system in place for adjusting funding in light of changed standards or costs.

For the student charge element, the idea of "private benefit" was used to justify the 1989 and 1997 increases to student costs, and corresponding reductions in per student public funding. Graduates typically earn more than non-graduates, and student charges reflect the belief that it is fair that they contribute something towards the cost of their education. The income-contingent loan scheme ensures that education is free for HECS-HELP debtors on low incomes. The idea of a "public benefit" from higher education broadly justifies government involvement in higher education. However, it is not used to calculate the level of public subsidy. The public subsidy is what is left after student contributions are deducted from the total funding rate per place.

Though private benefit provided the rationale for HECS, there was not much science to the amount. After adjusting for inflation, the flat $1,800 per year charged from 1989 was same as the average $480 a year tuition fees before they were abolished in 1974. It was equivalent to around 20% of average per student costs; that most OECD countries had private contributions of 20% or less was seen as a useful "overseas precedent".[4]

When differential HECS began in 1997, levels of private benefit were more precisely taken into account. Whether a subject was placed in the low, middle or high HECS charge band depended in part on "the likely future benefits to the individual in terms of increased life-time earnings". Law, medicine, dentistry, and veterinary science — occupations with high average earnings — were all put in the most expensive band 3. Humanities, nursing and teaching — courses that typically do not lead to high salaries — were all put in the least expensive band 1. The cost of the

[3] Based on an estimate of 17% of the HELP debt incurred in 2011-12 not being repaid: see DIISRTE (2012), p 101

[4] Wran (1988), pp x, 15, 53-55

course and student demand were also said to be taken into account.[5]

Differential HECS was the last funding reform that raised student charges and reduced government spending across the public higher education system.[6] Though most maximum student charges (now called student contributions) were increased by 25% in 2005, this premium was not a cut in public funding. In 2005, the extra money went to the student's university, not to the Government.

The 2005 reforms increased overall funding rates. An overarching system for setting funding rates, however, remains absent. This is one reason the government established a review of the higher education funding system, discussed in section 3.1.

2.2 Full-fee students

Full-fee places for international students and domestic postgraduates at public universities were introduced in the second half of the 1980s. By 2010, these students paid around $5 billion in fees.[7] Australia also has a non-university higher education sector, with around 130 non-university higher education providers (NUHEPs) registered in early 2012.[8] Their tuition fee income was at least $840 million in 2010 [9] Not all of their students are included in national statistical collections, but NUHEPs have contributed to the strong growth rates in full-fee enrolments seen in figure 8 (over the page). Together, students in these markets were 38% of Australian higher education enrolments in 2011.

Full-fee places operate in a very different way to Commonwealth-supported places. Instead of total funding rates being set through a political process, full-fee places are priced in the market. Observed fees suggest that in most disciplines the average market value of a degree is above the funding rate for a Commonwealth-supported place, and in all cases above the student contribution rate.[10] This suggests that full-fee students perceive private benefits — which could be a mix of financial and non-financial benefits — that are at or above the fee charged. With a wide range of prices in full-fee markets, this pricing system can take into account differences between students in forecast private benefits.

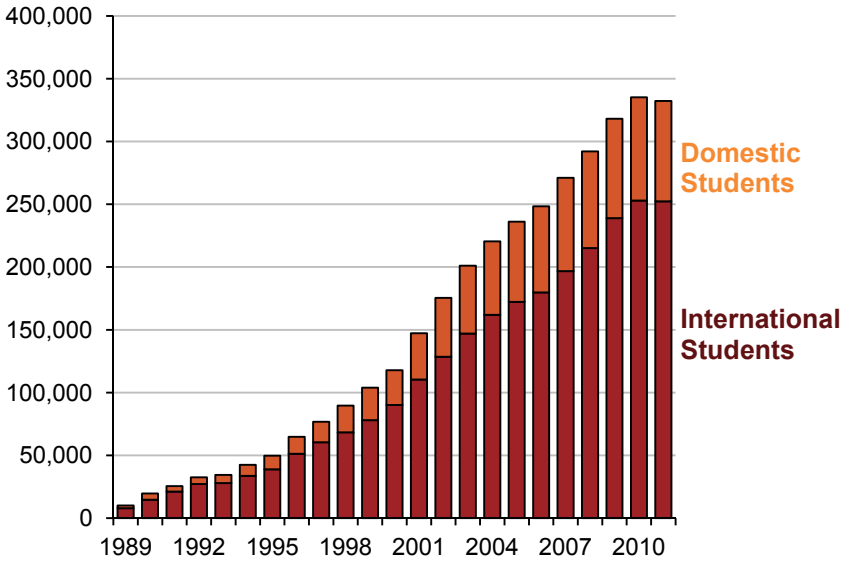
Income-contingent loans have been available since 2002 for domestic full-fee postgraduates at universities. From 2005, the loans were extended to domestic full-fee undergraduates and to domestic students at NUHEPs. This loan scheme, known as FEE-HELP, appears to have significantly increased demand for full-fee higher education, particularly in the private higher education sector. For example, the private Bond University's domestic undergraduate commencing student numbers have tripled in the years since FEE-HELP began. In 2011, 103,000 students took out

[5] Vanstone (1996), p10
[6] There have been some discipline level exceptions in teaching, nursing, and business.
[7] Grattan calculations from DEEWR (2011a)
[8] See the national register held by the Tertiary Education Quality and Standards Agency.
[9] Norton (2012), p 34
[10] Beaton-Wells and Thompson (2011), appendix 4. Some fees are also reproduced in Table 18.

a FEE-HELP loan, including more than 31,000 students enrolled outside the public university sector.[11]

Though there are no tuition subsidies for full-fee students, where FEE-HELP loans are made there may be some public cost. These come from interest subsidies on some FEE-HELP loans, and the risk that the loans will not be repaid.

Figure 8 – Full-fee enrolments
Number of full-time equivalent enrolments



Sources: DEEWR (2012b) DEEWR (2000)

[11] Grattan Institute calculations from Table 5.4 in DEEWR (2012b)

3. The base funding review

Following recommendations of the 2008 Bradley review of higher education policy, 2012 is a year of major policy change in higher education. Previous limits on numbers of funded undergraduate Commonwealth-supported places (CSPs) have largely been lifted for public universities. This "demand-driven" funding policy aims to increase the proportion of Australians with higher education qualifications. A new quality regulator, the Tertiary Education Quality and Standards Agency (TEQSA) has started operation.

CSP funding was unfinished business from the Bradley review. As section 2.1 shows, funding rates and the division between public and private contributions are not based on careful analysis of costs or benefits. So in 2010, the Commonwealth Government commissioned a review of higher education student funding, known as the "base funding review". It appointed a former South Australian education minister, Jane Lomax-Smith, to chair a panel conducting the review. The other panel members were two academics, Beth Webster and Louise Watson. Their task was to examine overall rates of funding, along with the split between Commonwealth and student payments. Their report was submitted to the government in October 2011 and released to the public in December 2011.[12] The Government is expected to make an in-principle response during 2012.

3.1 The 2011 base funding review's report

On overall funding rates, the base funding review panel made several recommendations. It advised that some disciplines should receive funding increases. This recommendation was based on a study of university teaching costs that identified disciplines in which per student expenditure exceeded per student revenue for Commonwealth-supported students. For all disciplines, the panel proposed a 2% increase to finance "contemporary learning spaces". The panel also suggested that universities be allowed to offer "flagship" courses to up to 5% of their Commonwealth-supported students, with 50% higher funding than other courses.

These suggestions would help deal with some immediate problems. With no major empirical investigation of costs in 20 years, it is unsurprising that in some disciplines per student funding rates and delivery expenditure do not match. Putting them back into alignment would limit the need for cross-subsidies within universities, and reduce the risk of universities under-supplying student places in loss-making disciplines. Increased capital funding for "learning spaces" would speed up renovation of dated university infrastructure. And the flagship courses could foster innovation and expand student choice in the public university system.

However, the base funding review's recommendations are ad hoc fixes, not long-term policy solutions. Given the dangers of funding rates not matching costs, Australian universities need a system that can regularly update funding rates. Occasional reviews that

[12] Lomax-Smith, *et al.* (2011)

can be ignored by governments for fiscal or political reasons are not enough. A more market-based system, or a price regulator with real power, are the main long-term alternatives. Future Grattan Institute research will examine these issues in more detail.

3.1.1 The 2011 base funding review's public-private split

In this Grattan report, the key issue is the split between Commonwealth and student contributions for CSPs. As table 1 shows, maximum student contributions vary between $4,520 and $9,425. Public funding differences are much larger, ranging from $1,861 to $20,284. In percentage terms, most students pay around a third of the total funding rate. However, law and business students pay over 80% of the total funding rate associated with their place.[13]

As explained in section 2.1.1, the current public-private split is the total funding rate less a student contribution based on assumed private benefits. The base funding review panel rejected this approach. Instead, they see a valuation of public benefits as the appropriate basis for setting public funding. To make this valuation, the panel drew on an economic analysis of public benefits.[14] This analysis calculated the additional tax revenue coming from a more skilled workforce. It added to the tax revenues an estimate of the value to society of other benefits of having more graduates in the population. These include greater civic involvement, lower crime rates, and more rapid rates of technological change. The value to Australia of these benefits was estimated on the basis of international research.

The base funding review panel's method of converting these estimates into public funding is a little complex, and is summarised in figure 9 (over the page). The panel took an upper estimate of the future value of public benefits per graduate, and divided that by the number of years in a degree. They then calculated this figure — $9,757 — as a percentage of the average annual per student funding rate of $16,530. With rounding, the estimated value of public benefits is 60% of the annual average funding rate. The panel then decided that this 60% figure should be the Commonwealth contribution, applied across all disciplines. The other 40% of the funding rate would be paid by students.[15]

If the base funding review's recommendations were accepted, student contributions would be a residual item: what is left to pay after the Commonwealth has contributed to the costs of education based on public benefits. Private benefits would explain why students should pay something for their education. But a calculation of private benefits would not determine the quantum of student contributions, as it has — albeit roughly — since differential HECS was introduced in 1997.

[13] From 2013, independently of the base funding review, the Government proposes changing the science and maths student contributions to match engineering and agriculture student contributions: Treasury (2011)
[14] Chapman and Lounkaew (2011)
[15] Lomax-Smith, *et al.* (2011), pp 102-103, 108-110

Figure 9 – Setting student contributions

Current system (simplified model)	Base funding review (simplified model)
1. Specify overall funding rates for each discipline (based on a 1980s cost study).	1. Specify overall funding rates for each discipline (based on the "base funding review" cost study).
2. Specify a maximum student contribution – based on expectations of future earnings. Degrees leading to high expected earnings (e.g. law) have a high maximum student contribution.	2. Specify the public benefit derived from a year of higher education ($X). This consists of tax revenue gains and non-financial public benefits.
	3. Calculate average student funding rate per place ($Y).
	4. Calculate the public benefit as a percentage of total funding rate Z%=($X/$Y).
3. The difference between the overall funding rate and the student contribution becomes the public subsidy.	5. Each discipline gets a subsidy equal to Z% of their funding rate (specified in step 1).
	6. Student contribution is then simply the difference between the overall funding rate, and the level of subsidy.
Student contribution is explicitly specified, and driven by the expected private benefit of different degrees	**Student contribution is a remainder**

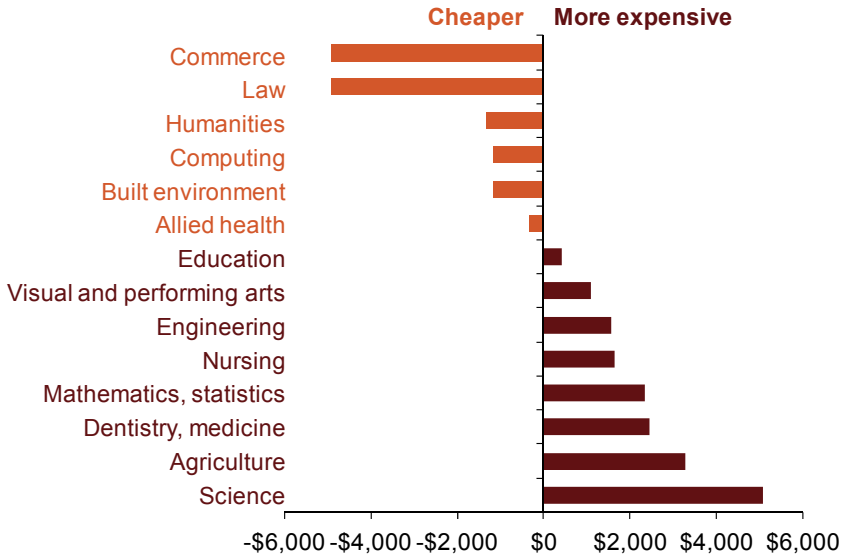
Under the base funding review panel's proposal, changes in overall funding rates would have automatic consequences for both the government and students, on a 60%-40% basis. To maintain the ratios, any increase in Government funding would have to be matched by higher contributions from students. And any increases in student contributions would have to be matched by increased Government funding.

Using current overall funding rates, figure 10 (over the page) shows the effect of 60%-40%. Because students in most disciplines currently pay less than 40% of their course costs, future students in those disciplines would pay more under 60%-40% (the base funding review panel recommends that changes be phased in, so existing students would not pay extra). The main beneficiaries would be law and business students, with science, engineering and nursing students among those paying more.

3.2 The teaching-research relationship

During the base funding review, one major issue was whether CSP funding rates were intended to cover teaching costs only. Historically, the government grant for teaching was also intended to support research. But since 2005, higher education support legislation has been silent on what is covered by student-driven funding. The question of whether research is supposed to be financed by student-driven funding has a big impact on any decision about whether the overall funding rate is adequate. It also has important implications for the split between public and private contributions to student-driven funding. Undergraduate students benefit directly from tuition spending, but benefit only indirectly as members of the community from research spending.

Figure 10 – Changes in student charges proposed by the base funding review
$ per year of study

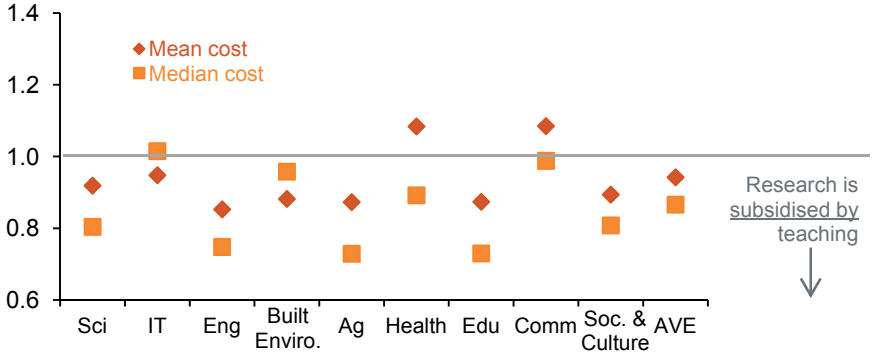


Note: *If the government succeeds in increasing science student contributions for 2013, the increase for that discipline would not be as large as shown in this figure.*
Sources: *Lomax-Smith et al. (2011); DEEWR (2012a)*

Though tuition and research raise different funding issues, university regulation and practice drive the two activities together. For higher education providers to use the title "university", they must meet minimum levels of research activity. They employ most of their permanent academic teaching staff to teach and to research. Reflecting this combination of activities, the main government grant for teaching is also used to support research. Figure 11 shows mean and median teaching and scholarship costs in eight universities, relative to the funding rate for a Commonwealth-supported place. Where costs are underneath the grey line, they are below the funding level for a Commonwealth-supported place. As can be seen, this is true for most disciplines. On average, a little under $1,000 per student from the teaching grant is available to support research.

The details of research funding are beyond the scope of this report. However, student-driven research funding is one mechanism for funding research. In the context of a "who pays?" debate, it raises important issues. A student-driven subsidy for research is not the same as a tuition subsidy. It is funding that follows the student, but is not for the student. The two types of student-driven funding, for teaching and for research, should be considered separately. Section 3.3 argues that if research funding is paid via a student-driven grant, there are fairness arguments for this to come from sources other than the student.

Figure 11 – Undergraduate teaching and scholarship costs relative to funding 2010



Source: *Deloitte Access Economics (2011a)*

4. Tuition subsidies from first principles

In sections 2 and 3, this report covered how student-driven higher education subsidies are set, and the recommendations of the 2011 base funding review. This chapter steps back from the historical and political compromises of current policy to think through the tuition subsidy system from first principles.

None of these principles are novel – ideas of market failure, private benefit, public benefit and fairness are all familiar ideas in higher education policy discussion. But higher education policy documents do not always work through them in a systematic way. This section proposes a way of doing so.

What follows assumes that an income-contingent student loan scheme is available, such as Australia's HELP loan scheme. HELP is a successful Australian policy innovation, which has achieved some of the original goals of tuition subsidies at significantly lower cost to taxpayers.

4.1 Public and private benefits

There are many benefits from higher education. Some accrue directly to students and graduates. The employers of graduates benefit from their skills. Benefits to students, graduates and employers are "private benefits". The general public receives benefits from the higher taxes paid by graduates, and from other contributions graduates make to the community. These are "public benefits".[16]

The distinction can seem a little artificial. After all, the work graduates do for their employers benefits others – people cross engineer-designed bridges, avoid ill-health through the work of medical professionals, and so on. And benefits described as "public" often end up benefiting private individuals, such as people assisted by taxpayer-financed benefits or services.

The public/private distinction is important to policymakers because the two benefit types have different incentives for students. Where benefits are private, the student is rewarded for their education. This gives them an incentive to study.

Where benefits are public, students do not have the same incentives. For example, what would happen if all higher education benefits went to others, and none went to students or graduates? Some altruistically motivated people would still go to university. But it is very unlikely that Australia would have 1.2 million students, as it did in 2011.

Graduate Winners support a policy focus on increasing higher education public benefit. Good policy design can potentially deliver extra higher education public benefits that would not exist

[16] The term "public good" is not used, as it has a technical definition which excludes some higher education benefits included in "public benefits". For a discussion of public goods and higher education as a mixed public and private good see Cullis and Jones (2009), pp 64-66, 68-71.

in purely market-based system. Tuition subsidies aimed at this goal are likely to be money well spent.

If there is no *additional* public benefit from higher education tuition subsidies, then they redistribute government resources to students and graduates. In Australia's largely needs-based welfare state, such "middle class welfare" requires special justification. The most prominent of these justifications is that tuition subsidies provide access to higher education for disadvantaged people. The issue is discussed in section 4.3.2.

There are two main public benefit types, non-financial and financial. Non-financial public benefits come from how graduates behave compared to other groups in the population. This can be increased good actions that bring benefits to others, such as more volunteering, or being more tolerant of different groups in society. The benefit can also be reduced bad actions that inflict costs on others, such as crime or spreading infectious diseases. Discipline-specific public benefits are activities or functions performed by graduates with specific knowledge or skills which are under-compensated by the market. For example, social workers provide services to people who usually cannot afford to pay for them.

Financial public benefits are revenue increases or expenditure decreases for government. A major private higher education benefit is increased income, which leads to more income tax. These tax revenues are then available for public benefit purposes. Where the government provides income support for unemployed people or subsidises healthcare, it saves money if higher education reduces unemployment or poor health. This frees up government revenues for other public benefit purposes.

These public benefit claims raise empirical questions. Do graduates have higher volunteering rates? Do they pay more tax? How large are these benefits? Is higher education the cause, or is it some other attribute of graduates? It is unlikely that there is a single answer to these questions. The answer could depend on who studies, what courses they take, how higher education is organised, and the general social and economic situation. Tax revenues require suitable jobs and graduates who are willing and able to work. Some fields of study produce higher tax revenues than others. Non-financial public benefits differ between courses. A public health course, for example, may lead directly to public benefits through improved health. However, other courses may only indirectly provide public benefits, through general graduate attributes.

These empirical questions are discussed in sections 5 and 6.

4.2 The link between public benefit and public subsidy

Drawing on the work of the British economist Nicholas Barr, the *Higher Education Base Funding Review Final Report* stated that "economic theory suggests that the public contribution towards a good should be based on public benefits of that good".[17] This is true, but only in some circumstances.

The view attributed to Barr alludes to a "market failure" argument for higher education tuition subsidies. The idea behind a market failure is that sometimes markets produce less than an "optimal" amount of some good or service. The optimal level includes

[17] Lomax-Smith, *et al.* (2011), p 108.

considering both public and private benefits. However, a prospective student may consider only the private benefits.

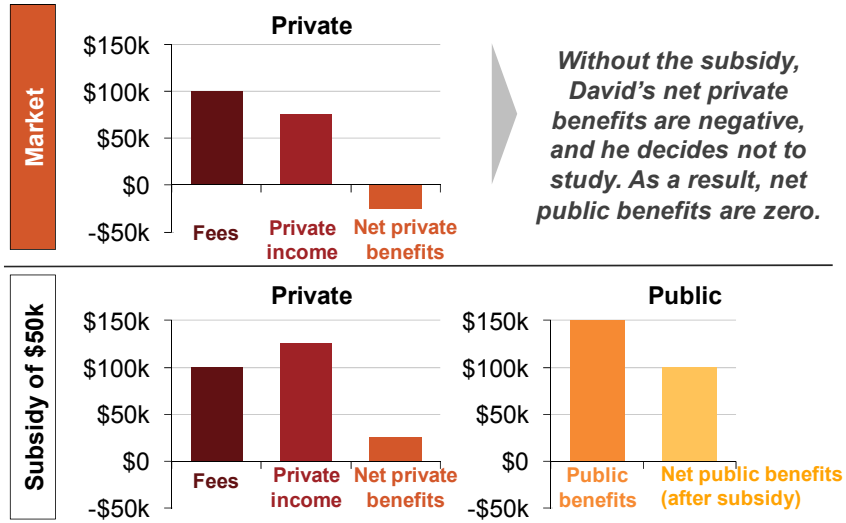
For example, a prospective student might consider how interesting they find a particular subject, the kind of job they hope to get on graduation, and how much money they are likely to earn. These private benefits can be compared to the cost of education, in tuition charges and time spent out of the workforce. However a prospective student is unlikely to consider the benefits others will receive if they go to university, such as more tax revenue, higher volunteering levels, or greater toleration of others.

If a prospective student believes that the private costs are too high relative to the private benefits, he or she may decide against continuing on to higher education. But where the public benefits would have justified further education, a "sub-optimal" result of under-education will occur. Consequently, there is a potential role for government in encouraging higher education enrolment.

Tuition subsidies are one way of making higher education more attractive to students. By reducing higher education's private cost, tuition subsidies improve its net private benefits (total benefits less total costs). Tuition subsidies almost always make students better off. However, tuition subsidies only sometimes make the general public better off. That occurs only when tuition subsidies cause additional public benefits, and the public benefits are worth more than the tuition subsidies.

The policy issues are more easily explained through examples. Figure 12 sets out the higher education economics of a hypothetical prospective student called David. In a market higher education system, David faces total course fees of $100,000. With a degree, David will earn $75,000 more over his lifetime than if he finished his education at year 12. After taking course costs into account, David is $25,000 worse off compared to his "no further education" option. He will probably, therefore, decide to forgo higher education. Taking only his private financial interests into account, this is his best option.

Figure 12 – Economics of higher education for "David"



However, David had planned to study public health, and work in a related occupation with low wages. Principally via this work, the public benefits of David taking the course would be worth $150,000 in bad health outcomes avoided. So the community as a whole would benefit if David takes his course. A tuition subsidy of $50,000 would halve David's fees, and leave him $25,000 better

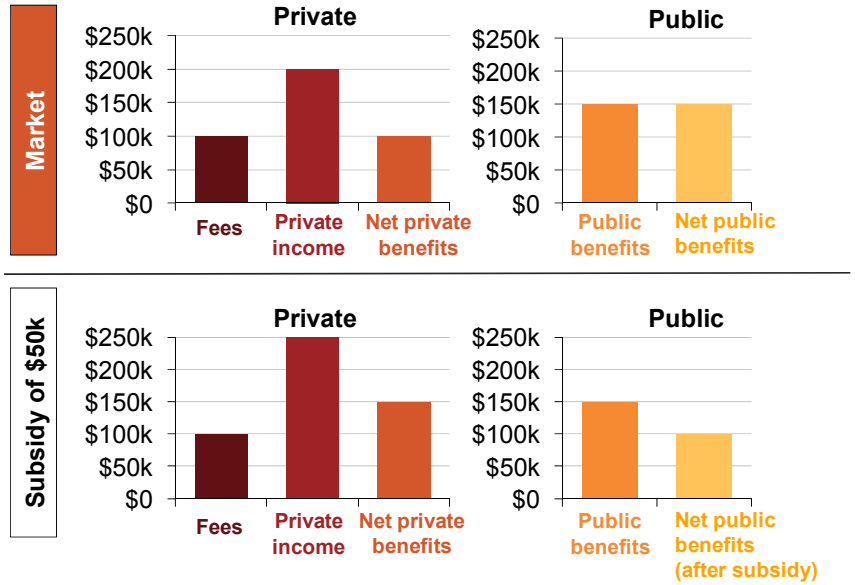
off compared to entering the labour force straight after school.

Study now looks more attractive to David, and he decides to take the course. The public spends $50,000 to encourage production of public benefits worth $150,000. It gains net public benefits of $100,000 over the course of David's career. All parties are better off as a result.

Compare David's situation with that of another prospective student, Emma (see figure 13). Like David, she faces course costs of $100,000. But unlike David, Emma expects to receive $200,000 in private benefits over her career as a corporate lawyer. After deducting course costs, her net private benefit will be $100,000. With this significant private gain, Emma will take her law course at its market price. Through the taxes she will pay and some volunteering work, Emma, like David, will produce public benefits worth $150,000. If she received his $50,000 tuition subsidy, it would not affect her enrolment decision. It would just increase her net private benefit from $100,000 to $150,000. The net public benefit would decrease from $150,000 to $100,000. The public is worse off if it subsidises Emma's education. The $50,000 spent on her tuition subsidy could have delivered additional public benefits in some other area. Instead, it just makes Emma more affluent than she would otherwise have been.

As the Emma example shows, in a market failure analysis a public benefit does not of itself justify a public subsidy. A public benefit is a necessary but not a sufficient condition of public subsidy. Where private and public benefits are both high, private benefits alone can provide the incentive for joint production of the public and private benefits. In these cases, the public can "free ride" on the public benefits that the graduate nevertheless produces. Whether the public *should* free ride is a different question, discussed in section 4.3.1.

Figure 13 – Economics of higher education for "Emma"



An efficient market failure correction policy aims to encourage the Davids while minimising handouts to the Emmas. Policymakers can use broadly predictable average differences between fields of study to guide their decisions. Since 1997, student contributions have been linked to expected private benefits (see section 2). Policymakers made a judgment that students in courses leading to high-paying professions are mostly people like Emma. Obviously, this is on average — in practice, many graduates will have lesser or greater private benefits. Some prospective

students may see the net private benefits as too low, and not take the course.

Precisely identifying the Davids and Emmas within each field of study will often be beyond policymakers. It may be worth paying subsidies to some Emmas, if this is the most efficient way of ensuring the Davids choose higher education. But if the prospective students are mostly Emmas, the public may be worse off overall if it pays a tuition subsidy. The total cost of the subsidies would exceed the total additional public benefit of encouraging the Davids in the group.

Though *designing* a market failure correction policy is difficult, *conceptually* a market failure rationale offers the cleanest justification for tuition subsidies. The problem being solved can be clearly stated. The cost of fixing it can be estimated. What the public gains when the government spends money on its behalf can be roughly calculated. Policy success or failures can be observed in the behaviour of students and graduates. Trade-offs between priorities can be assessed (are the outcomes worth the resources being invested, given alternative uses of the same money?). However, as will be seen in subsequent sections, market failure arguments under-explain current tuition subsidy patterns. Many students are being subsidised to take courses they would have taken anyway; they are more like Emma than David. The question then becomes whether there are other justifications for these tuition subsidies.

While the base funding review report starts in a market failure analysis, the panel members seem unconvinced that this provides a rationale for higher education tuition subsidies. Although they identify significant public benefits from higher education, they do not argue that larger tuition subsidies could increase these benefits. They doubt that a major lever of market failure correction, tuition subsidies, has much effect. Their report says that reducing course costs to stimulate student demand has only a "limited effect". They see correcting labour market shortages, which could arise due to low demand for higher education, as "not an efficient objective" of higher education funding.[18] The private rates of return on higher education investment outlined in their report, which are high in most disciplines, suggest that prospective students have little need of additional private benefit incentives to make higher education attractive.[19] This is also consistent with the large number of full-fee enrolments in Australia's higher education providers (section 2.2).

If this empirical analysis is correct, what are tuition subsidies achieving? They are perhaps changing the study preferences of a small number of people, but that does not seem much from billions of dollars in public funding. If market failure is not a major justification for tuition subsidies, we are left with fairness arguments.

4.3 Fairness justifications

When the base funding review recommended that nurses and teachers pay more for their higher education, and lawyers and accountants pay less, a common intuitive reaction was that this was a bad idea, that it was not "fair". Not all moral intuitions about fairness are sound. If people knew how low law and accounting subsidies were reactions might have been different. Nevertheless,

[18] Ibid. p 100
[19] Ibid. pp 105-107

the intuitive reaction is worth exploring, because fairness is a recurring idea in higher education policy, but with different meanings. If the public benefits from graduates, fairness might be between students and the general population. In the Commonwealth Government's policies on access, fairness relates to people from low socio-economic backgrounds compared to the rest of the population.

4.3.1 Free riding

The base funding review panel says that "subsidies are justifiable because society reaps some of the benefits from having a more highly educated population".[20] The practical effect of their recommendation is that the general public, through its taxes, should pay for these benefits. The largest higher education lobby group, Universities Australia, takes a similar view. The reasoning behind such claims is not well elaborated. If tuition subsidies have a limited practical effect, the argument looks to be a normative one about who should be responsible for financing public benefits.

For example, is it wrong to enjoy the benefits of higher education while expecting students and graduates to incur the cost? Is the Australian public "free riding" on benefits to which they ought to contribute?

In practice, Australians enjoy many benefits for free because it is in somebody else's private interest that they be produced. Examples include much of the internet's content, free-to-air commercial television and radio, and attractive private buildings and gardens visible to the public. Even on a voluntary basis, we rarely perceive an obligation to pay for these benefits, despite their large role in daily life compared to higher education's unpriced benefits.

In these cases, service providers appear to be already compensated via profits (as in the case of commercial electronic media), or not in any need (people with the wealth to afford attractive buildings and gardens). Additional compensation would be redundant; these service providers are already well rewarded. For public money, paying these groups would offend the principle that income be redistributed down, rather than up, the socioeconomic spectrum.

What triggers a normative claim for payment is not just using an unpriced service, but doing so in ways seen to take advantage of its provider. The provider may be unable for practical reasons to charge for their service (such as in very general public benefits, for example in being a more informed citizen), prevented from charging by regulation (some freely provided public services), or unwilling to charge because it would restrict use of their service. However, the provider still offers their service at low or no wages due to, at least in part, charitable or community motivations.

The non-financial public benefits of higher education are of a general nature. However, they would need to be very widely provided by graduates or some identifiable sub-group of graduates compared to the rest of the population to justify a "fairness" contribution to their original tuition costs. Otherwise, it is unclear why graduates but not others with similar behaviour should be rewarded for their contribution to society. Graduates are not the only people who volunteer or are tolerant of different cultures. Section 5.3 explores the prevalence of non-financial public benefits.

[20] Ibid. p 102.

Some graduates work in occupations that offer public benefits, while not offering high salaries, at least compared to other graduates. Social service occupations such as nursing, teaching or social work are possible examples. People are often drawn to these occupations for at least partly public-spirited reasons. Payment through tuition subsidy may compensate for lower private financial benefit, relative to other occupations they could have pursued. Section 7 explores this idea in more detail.

For other graduates, however, free rider arguments for public benefit compensation seem weak. Like Emma in section 4.2, they are already well-rewarded through the market. Paying them the value of their public benefits – as would occur under the base funding review's recommendation – privatises the public benefit. In contrast to the market failure approach to higher education policy, the free rider compensation rationale for tuition subsidy does not in principle leave the general public better off. The additional tax revenues and priced non-financial benefits are paid back to students, leaving the general public in a neutral position.

Should students pay for research?

The funding of university research raises more complicated policy problems than the funding of university teaching. Though some university research has commercial potential and attracts private investment, most of it does not. Even when university research findings could be sold, there are policy arguments for giving it away. The public benefit from distributing knowledge for free can exceed the cost of its creation and distribution. This is a common argument for government research funding, as it is not obvious in theory that private interests will support public benefit research on a large scale.

In practice, however, Australia's public universities have found a way to use private interests to finance research. They use profits on fee-paying students, mainly from overseas, to support their research activities.[21] The desire of these students to acquire degrees from particular universities leads them to pay fees high enough to support research as well as tuition. Surveys of international students show that most of them consider university rankings when choosing a university.[22] These rankings are research-driven, so perhaps international students are buying the prestige of highly-ranked universities.

From a market failure perspective, there are risks in bundling tuition and research together. It inflates the price of higher education, perhaps making it prohibitively expensive for students with modest expectations of future private benefit. In a higher education market that includes teaching-only higher education providers this is not necessarily a problem. Only those students who expect high private returns will attend research-focused universities with high fees. The market problem becomes Australia's policy bias to teaching-research universities (section 3.2), which means that most higher education providers have high costs.

Though some universities can charge premium tuition fees to finance research, normatively this is not a good policy basis for research funding. Students are not more likely to benefit from the research than any other member of the population, so there is no obvious moral reason why they should incur a disproportionate share of the costs. By contrast, students do incur more benefit

[21] Beaton-Wells and Thompson (2011)
[22] Varghese and Brett (2011)

than the rest of the population from spending on tuition. They are not asked to pay extra because there are public benefits from a more educated population. These public benefits are either incidental, such as paying more tax (which flows from high income, not the degree itself) or freely chosen, such as more volunteering. If the government requires teaching and research to be combined in universities, research costs should fall on the beneficiaries, through the taxation system. This report supports the base funding review panel's conclusions on this issue.[23]

4.3.2 Fairness to low socio-economic status people

Fairness arguments may not support paying tuition subsidies to students in general. But many people believe that a more expensive or full-fee higher education system would be unfair to low socio-economic status (SES) people. If they are priced out of higher education, family money rather than ability and effort would determine who gets access to jobs that require degrees. The current government is concerned that this may happen. It identifies tuition fees as a possible barrier to students from low socioeconomic backgrounds.[24]

This fairness argument has a common sense basis. Less money means less capacity to pay for priced services. The fact that higher education participation and attainment varies across the socioeconomic spectrum is consistent with this view. The children of high SES parents are the most likely to attend university, and the children of low SES parents are the least likely to attend university.

Table 2, for example, shows that around half of 20-24 year old children of managers and professionals are at university or have a degree already. The children of parents from other occupational groups have enrolment and attainment rates that are between 21 and 34 percentage points lower.

Table 2 – Level of highest education enrolment or attainment for 20-24 year olds, by parent's occupation

	Parent occupation			
Highest qualification or enrolment of children (20-24)	Manager & professionals	Technicians & trade workers	Community, clerical & sales workers	Machinery operators, drivers and labourers
Bachelor degree or above	49%	23%	28%	15%
Certificate III - Advanced diploma	31%	42%	33%	31%
Year 12	12%	16%	18%	29%
Below Year 12	7%	19%	21%	27%

Note: *Where parents had different occupations, the occupation requiring the highest skill level was used.*
Source: *Based upon ABS (2011c)*

Though up-front tuition fees would exclude some low SES students, in Australia there is generally no need to pay up-front.[25] The HELP student loan scheme equalises capacity to pay across the SES spectrum. Any citizen accepted into a higher education provider with HELP eligibility can access a HELP loan. HELP offers very favourable terms for students and graduates. The

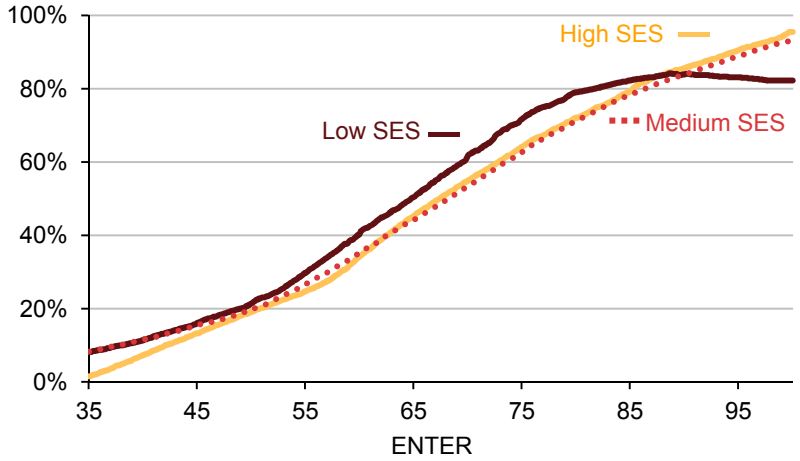
[23] Lomax-Smith, *et al.* (2011), p 109
[24] For example, in the terms of reference for the base funding review: ibid., p 142
[25] The exceptions are in some private higher education providers that have not applied for FEE-HELP loans, and students who have reached their FEE-HELP borrowing limit.

interest charged is the inflation rate only. No repayments are required on annual incomes of less than $49,000 a year. So for people on low incomes, higher education is free. Students with low personal or family incomes are also entitled to student income support, through Youth Allowance, Austudy or Abstudy.

Many studies have investigated whether socioeconomic status affects responses to tuition costs. In a survey of school children, low SES students were more likely than high SES students to identify cost as a factor affecting their post-school education (though SES differences were larger for cost of living than cost of study).[26] However, research on actual post-school choices finds little or no difference between SES groups, given their respective starting points. The strongest study, with detailed school performance and family background information, found no SES differences once academic results were taken into account.[27] Figure 14 (over the page) shows some results from that study. At each rank of school academic performance, rates of university attendance are very similar across low, middle and high SES groups.

Other studies use occasional changes in student charges to compare apparent responses across SES groups.[28] These sometimes find larger negative reactions to cost increases in low than high SES groups. However, these studies use enrolment numbers to infer demand for higher education. Prior to 2012, the government limited total enrolments without regard to demand, and universities rationed places according to school results. It is therefore possible that low SES people were less likely to receive offers due to rationing, rather than less likely to apply.

Figure 14 – University participation by school results
% of SES group going on to higher education



Note: *"ENTER" is an age cohort school results ranking. So for example, students with an ENTER of 95 or above are in the top 5% of their year. The apparent levelling off in low SES participation above an ENTER of 80 may not be real. Few low SES students receive results at this level, so the decisions of a small number of people in the survey sample could skew the results.*

Source: *Cardak and Ryan (2006)*

Some SES-based differences in reactions to tuition fees cannot be ruled out. However, any such differences are clearly not a major cause of the patterns of attendance and attainment observed in table 2. Students across the SES spectrum make similar choices between their realistic options, but low SES people have fewer options to choose from. This is because large SES-related gaps in academic achievement persist from the earliest

[26] James (2002), p 33
[27] Cardak and Ryan (2006);Cardak and Ryan (2009)
[28] Deloitte Access Economics (2011b)

years of education, flowing through to lower school completion and achievement.[29] It is the poorer school performance of low SES students that narrows or eliminates higher education opportunities. Until academic results are improved, only modest increases in low SES higher education enrolment and attainment are possible. These conclusions are now largely accepted by traditional opponents of tuition charges, such as the National Union of Students.[30]

Intuitions about the fairness of tuition fees were formed at a time when there was no loan scheme for higher education charges. In that context, the underlying concerns were reasonable. However, the HELP loan scheme shows that tuition subsidies are not essential to university access. The costs, risks and benefits of higher education compared to its alternatives are assessed in similar ways across the SES spectrum. Charging for higher education does not, on the evidence to date, create unfair social background differences in SES attendance.

4.3.3 When should a tuition subsidy be paid?

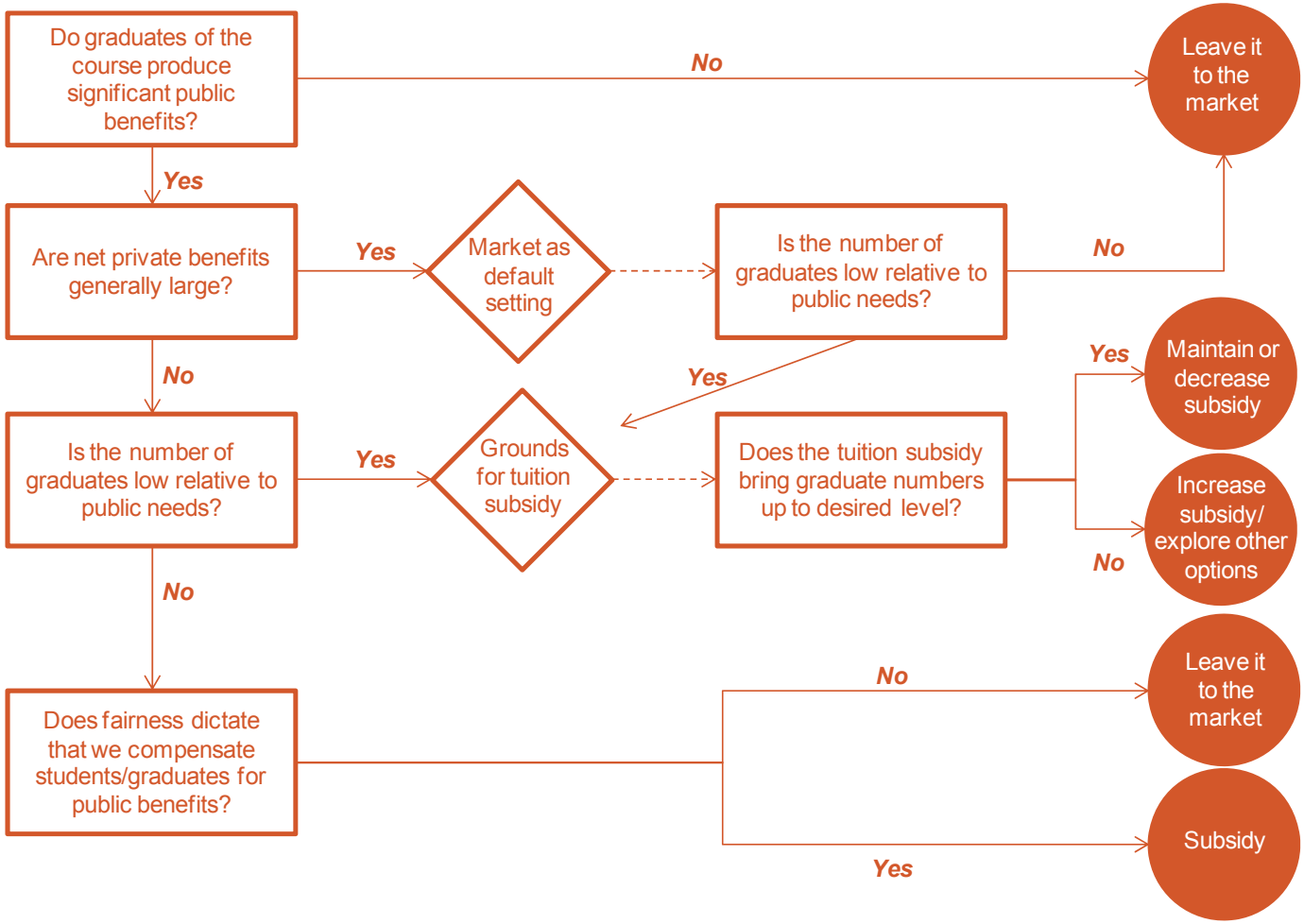
Figure 15 (over the page) offers a framework for thinking through the policy issues involved in setting student subsidies. Public benefit is the core idea, as it is for the base funding review panel. The base funding review's recommendation is that the public should pay the value of the benefits it receives from higher education. This report's approach is that the public should receive a net benefit from its higher education investment. Therefore, if the public can "profit" from higher education it should do so, subject to fairness constraints. In each step of the argument, empirical evidence is needed. As public benefits and student behaviours are likely to differ between disciplines, each needs to be considered separately. A sample of disciplines is examined in section 7.

The first analytical step is to consider whether graduates of the course produce significant public benefits. Section 5 looks in more detail at what is counted as a public benefit. A "significant" public benefit is one that exceeds any tuition subsidy that might be paid. Without this requirement, any tuition subsidy is just a transfer of wealth from taxpayers to students and graduates. If a course does not satisfy the significant public benefit test, students can decide in a market whether they are willing to pay the fees charged.

Figure 15 next asks whether a course's net private benefits are typically large. Net private benefits are the financial and non-financial benefits of the course, less study costs (mainly tuition fees and wages forgone while studying). This step checks on the potential for market failure discussed in section 4.2. Where net private benefits are high, the course is likely to attract students whether or not a tuition subsidy is paid. A full-fee higher education market is the default policy, to avoid tuition subsidies adding to private benefit rather than expanding the public benefit. However when the net private benefit is low, such as in section 4.2's David example, a tuition subsidy can make a course more attractive.

[29] ACARA (2011)
[30] Hastings (2011). However, NUS still maintains that tuition charges are an 'aspirational constraint' on pre-Year 12 students.

Figure 15 – Framework for thinking through tuition subsidies



Student behaviour may sometimes not match theoretical expectations. Demand could be soft, despite high net private benefits. For example, the course in question could be in competition with courses with still higher net private benefits. A tuition subsidy can increase a course's net private benefit, and make it more competitive. Or prospective students may regard the course as high risk for future private benefits. Section 6 shows that some disciplines have high "breakeven points", meaning that many graduates are not benefiting financially from their degree.

A tuition subsidy shifts some risk to taxpayers (though in Australia, the taxpayer already takes some of the risk through the income-contingent HELP loan scheme). With a different spread of risk, a tuition subsidy may increase course demand.

Deciding whether or not a subsidy is needed is easiest, though not necessarily easy, for specific skills shortage. Employers report staff recruitment difficulties in regular surveys. Occupations appear in skills shortages lists when recruitment problems are widespread. Skills shortages are not necessarily caused by too few qualified people. Uncompetitive wages or conditions may be the real problem. However, the education system is a factor where skills shortages persist despite most new graduates entering the relevant occupation. In recent years, graduate shortages have occurred in several health and engineering occupations. The question then becomes what is causing inadequate supply. If it is weak demand, then there are policy grounds for a tuition subsidy.[31]

Tuition subsidies increase a course's net private benefits. While tuition subsidies do not necessarily have a major impact on the real lifetime economics of a course (section 8), they may have behavioural effects that exceed their actual financial importance. Financial rewards in the distant future are generally less salient in decision-making than tuition fees owed now or in the near future.

Sometimes tuition subsidies will not be the only or the ideal way of increasing demand. Prospective students may not be aware of all their career options, and information or marketing programs may be a better way of increasing student demand. The Minerals Council of Australia, for example, ran a television advertising campaign in 2012 to attract more people to mining careers. An empirical approach is needed when trying to build demand for specific higher education courses. Policymakers may need to try several different strategies to achieve the desired outcome.

Despite policy and employer concern with student preferences, demand-side higher education problems are unusual. To date, aggregate demand for higher education has exceeded the aggregate supply of places.[32] There are no general shortages of graduates, as workers with higher education qualifications significantly outnumber high-skill professional and managerial jobs.[33] Demand shifts towards courses with occupations in labour market demand.[34] These empirical findings suggest that existing private benefits (which include tuition subsidies for Commonwealth-supported students) are enough to encourage people to enrol in higher education courses.

Generally strong demand for higher education means that the practical problem of attracting students will only arise

[31] Norton (2012), pp 71-73 gives more detail on identifying skills shortages

[32] See DEEWR (2011c), p 28

[33] ABS (2011a), Table 11

[34] Norton (2012), pp 55-58

occasionally. The last box in figure 15 considers whether the government should nevertheless pay a tuition subsidy. This returns the argument to the ethics of free-riding discussed in section 4.3.1. Generally, as section 6.1 shows, graduates enjoy significant financial advantages over non-graduates. However, graduates in various social service professions earn less than graduates in more commercial occupations. Nurses, teachers and social workers are examples of social service workers who are modestly paid relative to other graduates.

Reasonable people will disagree on whether lower pay requires compensation through other means. There are psychological rewards from helping others, or from doing a job valued by society. The total rewards from a job include both financial and non-financial benefits. However, the case for a fairness-based tuition subsidy seems strongest when a personal sacrifice, especially in financial terms, is made to pursue a particular career. The specific circumstances in which this might arise are considered further in section 7.

5. Do graduates produce public benefits?

Public benefits are critical to deciding whether or not higher education tuition subsidies are a productive use of public money. The core idea is that graduates need to produce benefits for people who are not directly paying for them. In the public funding framework outlined in section 4, if there are no public benefits from a particular course then no tuition subsidy should be paid. However, even where public benefits are associated with graduates a case for a tuition subsidy is not automatically made. There are other issues that need to be considered.

To justify public tuition subsidy on market failure grounds, we need to be reasonably confident that higher education *causes* public benefits. Students are not blank slates when they arrive at university: they already have a range of abilities, aptitudes and attitudes. So while graduates may on average pay more tax, or be more likely to volunteer, higher education may not the cause. The graduates' prior attributes may also explain why they earn or volunteer more. In what follows, this report uses past research and various statistical techniques to help us identify which differences in outcomes or attitudes are likely to be caused by higher education. However, some doubt often remains.

When a causal relationship is proven or probable, the size of public benefits needs to be considered. Governments do not fund higher education in isolation from their other priorities. Does higher education produce a larger public benefit than the same money's alternative uses? The difficulty here is in putting a value on public benefits. Tax revenues can be estimated; so can some of the savings when negative outcomes are avoided. But how much would increased civic engagement among citizens be worth? While some studies estimate a financial value for non-financial benefits, these figures should be treated with caution. Qualitative judgments about the importance of public benefits may be more meaningful, even if they cannot be added up.

The base funding review panel commissioned Bruce Chapman and Kiatanantha Lounkaew to estimate the value of the public benefits of higher education. They note the difficulty of the task and that the conclusions reached are "invariably contentious and debatable". They preferred to suggest a range of potential values rather than a precise number. As section 3 reports, their headline result was that university study generated public benefits worth between $6,098 and $9,757 per year of study.

In coming to the $6,000-$10,000 range, Chapman and Lounkaew present a number of arguments:

- Higher education provides people with skills that increase their incomes. The uplift in incomes, in turn, generates extra tax revenues for society;
- Taken together, non-financial benefits (such as better public health and democratisation) are worth approximately 30% of the skills-based increases in tax which result from higher education; and
- The expected value of higher education public benefits does not substantially differ across disciplines.

This section evaluates these arguments using original analysis of Australian data on both the financial and non-financial public benefits of higher education.

5.1 Public financial benefits

As section 6.1 discusses in detail, graduates with a bachelor degree tend to earn higher incomes than people who finish their education at the end of year 12. Some of this extra income ends up as tax revenue, which can be used to finance public benefits.

These extra tax revenues can be significant. Analysis using the 2006 Census suggests that across a lifetime, the average female graduate pays around $240,000 more in tax than the average non-graduate.[35] For men, the difference in average tax contribution between graduates and non-graduates is around $360,000.[36]

Clearly, these amounts would grow with higher marginal tax rates. In other words, increasing income taxes would increase the public benefit of higher education. For example, changing the marginal tax rate from 30% to 40% in the middle tax bracket (which at the time of the 2006 census covered incomes of $25,000 to $75,000 per year), increases the estimated net public financial benefit of average female graduates from around $240,000 to $310,000.[37]

Moving beyond these averages, the impact of higher education on wages varies considerably across disciplines. As a result, the tax effect – i.e. the public financial benefit – varies by discipline. For example, over a lifetime the median female doctor pays an estimated $740,000 more in tax than the median woman who finished their studies at year 12. This is significantly larger than the estimate for the additional lifetime taxes paid by the median female science graduate (around $200,000).

The impact of higher education on lifetime tax contributions also depends on how successful graduates are within their discipline. Over a lifetime, a male IT graduate in the 60th percentile of wage outcomes (i.e. someone consistently just above the median in the group "men with an IT degree") ends up contributing around $570,000 more in taxes than the median year 12 completer. In contrast, at the 20th percentile, male IT graduates contribute less than the median non-graduate: a net loss (in terms of forgone tax revenues) of roughly $30,000.

Table 3 (on page 41) illustrates how graduates compare to non-graduates in terms of tax contributions. Most of the numbers are positive, which shows that a majority of graduates pay more tax across their lifetimes than their non-graduate counterparts. However, the table also contains some negative numbers (shown in red) illustrating that for some graduates lifetime tax contributions are lower than those of the median non-graduate.

[35] These calculations include income tax and Medicare payments.
[36] None of the analysis that follows incorporates a 'discount rate'. This rate is often used to reflect the idea that $1 today is worth more than $1 tomorrow. In the *Detailed Financial Analysis* document – available on Grattan's website – all of the results presented in this report are re-calculated with discount rates ranging from zero to 5%. All of our main results are robust to these changes.
[37] As the analysis uses 2006 census data, the tax rates in operation in FY2007 were used. See *Detailed Financial Analysis* for more information.

In addition to the impact university has on tax revenues, the public costs of higher education need to be considered. As discussed in the accompanying document *Detailed Financial Analysis*, these costs include the tuition subsidies paid by the Commonwealth, and any unpaid HECS-HELP debt. Table 4 (page 42) illustrates the difference between the public financial impact of graduates and non-graduates, once the public costs of education are taken into account. Once again, most, but not all, the numbers in the table are positive, with graduates paying more tax than non-graduates.

At this point, it is important to note that table 3 implicitly assumes that the uplift in graduates' earnings (compared to non-graduates) can be completely attributed to their higher education. In reality, however, these extra earnings may flow from other factors both related to and independent of universities:

1. Training: graduates earn more (and pay more tax) because they have developed valuable skills or characteristics at university.

2. Ability: graduates earn more (and pay more tax) because, irrespective of their university education, as a group they have above-average capabilities.

3. Signalling: graduates earn more (and pay more tax) purely because they have a degree. The degree itself is worth something as employers use it as a signal about graduates' capabilities (regardless of what the individual's capabilities actually are).[38]

The *public* primarily benefits from the first of these effects. Without the training university provides, Australian workers would be less productive, earn lower wages, and contribute less tax revenue.

In contrast, the extra tax paid by graduates on account of their above-average ability is a public benefit, but not one produced by higher education. The absence of universities would not mean the absence of high-ability individuals. The public would benefit from the labours of talented people regardless of whether or not they go to university.

Signalling provides some benefit by matching people with jobs that suit their skills, abilities and attributes. Signalling benefits are largely private. Graduates benefit largely at the expense of non-graduates who may be able to do the job, but whose skills are less observable. Employers benefit by saving on employee search costs and reducing the risk of bad hires. However, studying for years is probably not an efficient way of identifying the likely characteristics of potential employees.

The literature on the relative importance of training, ability and signalling is inconclusive. The *Higher Education Base Funding Review Final Report* (drawing on the work of Chapman, B and Lounkaew (2012)) suggests "the range of human capital contribution [training] to the higher income of a university graduate

[38] This notion rests on the twin ideas that employers are unsure of the qualities of prospective employees, and that having a university degree effectively sorts for high-capability individuals.

can be argued to be around 25-40 per cent".[39] However, the empirical estimates underpinning the 25-40 per cent range are highly uncertain, and we have been unable to verify this range with any confidence.

Consequently, no particular estimate is favoured. However, to inform the reader of the impact of this assumption, *Detailed Financial Analysis* presents public financial benefit estimates based on the guess that 40% of the increase in graduate wages can be attributed to the training effect (i.e. that graduates increase their capacities above-and-beyond non- graduates' while at university). It is relatively straightforward to vary this assumption by multiplying the results in table 4 by the factor of choice.[40]

Regardless of the extent to which graduates' extra income is attributed to university, table 3 and table 4 (and table 19 in *Detailed Financial Analysis*) are consistent on two points:

- There is substantial variation across disciplines in the public financial benefits of university education
- While most graduates do make a positive public financial contribution, for some disciplines there are significant numbers of graduates who represent a net public financial cost (independent of the cost of their education).

[39] Chapman and Lounkaew (2012), p 7
[40] This will give a good approximation of the model results – although there will be downward bias in estimates generated by this technique, as in the model the discount is applied to the wage premium (rather than to the net result).

Table 3 – Compared to non-graduates, how much more tax do graduates pay?
Net tax gain/loss across disciplines, assuming no ability bias or signalling effect.
Comparison point median non-graduate with a year 12 only education. Note that numbers do **not** include tuition subsidies

(xth percentile means that out of 100 graduates in a discipline, there are x earning less)	PERCENTILES	10th	20th	30th	40th	50th	60th	70th
Agriculture	Female	-$110,239	-$78,879	-$26,015	$37,800	**$118,833**	$229,249	$336,081
	Male	-$263,278	-$153,810	-$24,798	$94,055	**$209,078**	$319,507	$443,568
Architecture	F	-$111,773	-$52,028	$26,542	$125,707	**$229,957**	$340,494	$477,034
	M	-$193,067	-$11,800	$125,891	$249,724	**$366,871**	$510,334	$725,818
Commerce	F	-$115,695	-$49,231	$43,485	$154,329	**$266,706**	$388,058	$524,759
	M	-$182,241	$8,799	$167,947	$318,419	**$496,027**	$710,408	$847,558
Dentistry	F	-$93,599	-$954	$149,210	$328,918	**$488,864**	$658,195	$902,213
	M	-$36,049	$246,401	$513,846	$775,549	**$919,643**	$983,982	$1,009,920
Education	F	-$96,213	-$19,344	$74,689	$176,289	**$272,472**	$364,204	$454,484
	M	-$171,355	-$937	$103,978	$177,964	**$248,004**	$317,395	$393,738
Engineering	F	-$120,485	-$87,295	-$5,977	$96,470	**$200,596**	$311,631	$439,558
	M	-$193,241	$6,339	$170,611	$321,100	**$477,967**	$669,204	$838,732
Humanities	F	-$120,446	-$93,184	-$42,488	$27,241	**$122,393**	$233,877	$357,086
	M	-$292,669	-$225,620	-$127,721	-$23,282	**$83,325**	$202,083	$335,100
Information technology	F	-$113,046	-$46,322	$63,161	$207,304	**$372,127**	$505,253	$663,630
	M	-$222,330	-$34,796	$126,447	$263,607	**$406,747**	$573,522	$755,122
Law*	F	-$95,964	$29,854	$198,487	$360,544	$522,383	$707,728	$971,486
	M	-$142,600	$113,274	$327,975	$572,267	$784,327	$896,189	$935,505
Mathematics	F	-$115,029	-$66,054	$25,244	$149,627	**$279,733**	$414,332	$548,566
	M	-$255,616	-$86,630	$71,695	$213,484	**$345,002**	$500,819	$696,174
Medicine	F	-$72,124	$167,592	$363,679	$536,918	**$736,547**	$941,781	$1,073,948
	M	$120,286	$488,227	$762,862	$847,165	**$889,411**	$916,087	$937,339
Nursing	F	-$83,135	-$2,721	$71,769	$152,550	**$232,742**	$313,388	$402,905
	M	-$178,299	-$21,587	$83,189	$167,641	**$240,961**	$320,144	$397,748
Performing Arts	F	-$118,668	-$92,650	-$51,678	-$3,669	**$56,741**	$144,128	$254,939
	M	-$290,789	-$239,109	-$170,921	-$93,082	**-$10,740**	$79,817	$194,006
Sciences (excl. maths)	F	-$117,848	-$70,812	-$3,186	$89,045	**$196,536**	$310,146	$429,544
	M	-$245,707	-$92,439	$47,716	$162,701	**$274,762**	$402,154	$585,851

Note: *The highest income category in the census is >$2,000. For law and medicine, this limitation applies to graduates in the 60th percentile of the income distribution. Numbers for the 70th percentile should be treated as a lower bound. While we strive to present as complete a picture as is possible, this aspect of the data explains why the table is cut-off at the 70th percentile. Note that figures include neither a time discount nor an 'ability discount' (the most generous assumptions in terms of valuing graduate financial benefits.)*

Table 4 – Compared to non-graduates, what financial impact do graduates have on the public?

Net tax gain/loss across disciplines*, assuming no ability bias or signalling effect.
Comparison point median non-graduate with a year 12 only education. Note that numbers **include** tuition subsidies

(xth percentile means that out of 100 graduates in a discipline, there are x earning less)	PERCENTILES	10th	20th	30th	40th	50th	60th	70th
Agriculture	Female	-$178,694	-$147,335	-$94,471	-$30,656	**$50,377**	$160,793	$267,625
	Male	-$331,734	-$222,265	-$93,254	$25,600	**$140,623**	$251,051	$375,112
Architecture	F	-$147,567	-$92,475	-$19,972	$68,144	**$186,056**	$302,540	$428,429
	M	-$255,957	-$96,346	$34,620	$149,429	**$255,594**	$371,287	$539,038
Commerce	F	-$123,463	-$56,998	$35,717	$146,561	**$258,938**	$380,290	$516,991
	M	-$190,009	$1,032	$160,179	$310,651	**$488,259**	$702,640	$839,791
Dentistry	F	-$132,182	-$39,536	$110,627	$290,336	**$450,281**	$619,612	$863,630
	M	-$74,631	$207,819	$475,264	$736,967	**$881,061**	$945,400	$971,338
Education	F	-$126,667	-$49,798	$44,235	$145,835	**$242,018**	$333,750	$424,030
	M	-$201,809	-$31,391	$73,524	$147,509	**$217,550**	$286,941	$363,284
Engineering	F	-$171,859	-$138,670	-$57,352	$45,096	**$149,221**	$260,256	$388,184
	M	-$244,615	-$45,036	$119,237	$269,726	**$426,592**	$617,830	$787,357
Humanities	F	-$133,537	-$106,275	-$55,579	$14,149	**$109,302**	$220,785	$343,995
	M	-$305,760	-$238,711	-$140,813	-$36,373	**$70,234**	$188,991	$322,009
Information technology	F	-$136,195	-$69,471	$40,012	$184,155	**$348,978**	$482,104	$640,481
	M	-$245,479	-$57,945	$103,297	$240,458	**$383,597**	$550,373	$731,972
Law*	F	-$100,686	$25,132	$193,765	$355,823	$517,661	$703,006	$966,764
	M	-$147,322	$108,552	$323,253	$567,545	$779,605	$891,467	$930,784
Mathematics	F	-$130,489	-$81,515	$9,784	$134,167	**$264,272**	$398,872	$533,105
	M	-$271,076	-$102,090	$56,235	$198,024	**$329,542**	$485,359	$680,714
Medicine	F	-$152,617	$87,099	$283,186	$456,425	**$656,054**	$861,288	$993,455
	M	$39,793	$407,734	$682,369	$766,672	**$808,918**	$835,594	$856,846
Nursing	F	-$113,665	-$33,251	$41,239	$122,020	**$202,212**	$282,859	$372,375
	M	-$208,829	-$52,116	$52,659	$137,111	**$210,431**	$289,615	$367,218
Performing Arts	F	-$147,135	-$121,117	-$80,145	-$32,135	**$28,274**	$115,662	$226,473
	M	-$319,256	-$267,576	-$199,388	-$121,548	**-$39,207**	$51,351	$165,539
Sciences (excl. maths)	F	-$156,379	-$109,342	-$41,717	$50,514	**$158,005**	$271,615	$391,013
	M	-$284,238	-$130,970	$9,185	$124,170	**$236,231**	$363,623	$547,320

Note: **Includes income tax, Medicare payments, and the public costs of education; the highest income category in the census is >$2,000. For law and medicine, this limitation applies to graduates in the 60th percentile of the income distribution. Numbers for the 70th percentile should be treated as a lower bound. While we strive to present as complete a picture as is possible, this aspect of the data explains why the table is cut-off at the 70th percentile. Note that figures include neither a time discount nor an 'ability discount' (the most generous assumptions in terms of valuing graduate financial benefits)*

5.2 Reduced reliance on welfare

As well as generating additional tax revenues, graduates generate fewer claims than non-graduates on government social programs. This frees up government financial resources for other public benefit spending, or for lower overall taxation levels.

Table 5 shows income support rates for people who completed year 12 education, divided according to their level of post-school education. In the two years before 2010, 12 per cent of graduates had relied on government payments as their main source of income for at least some of the time. However, this was less than half the income support reliance rate of people who had not been to university.

As with earlier analyses of the benefits of higher education, however, not all the advantages of graduates can be attributed to their higher education experience. The people who become graduates were always likely to be less reliant on income support.

Table 5 – Reliance on income support

Postgraduate	9%
Bachelor	12%
Diploma	21%
Certificate III/IV	23%
Year 12	29%

Note: *Question wording: "At any time during the last two years has any form of government pension, benefit or allowance been your main source of income?" All categories include only people who completed year 12.*
Source: *ABS (2011b)*

5.2.1 Other potential savings

The base funding review included improved health in its calculation of public benefits.[41] Health is included in a list of higher education's private benefits (section 6.2.5). The analysis there suggests that there is a health effect from higher education, after taking into account other factors that may influence the health of graduates. It is difficult to calculate the long-term financial effect on government of improved health. In their younger years, graduates are likely to make less use of government-subsidised health services. However, their relative longevity means that they will use government health services for a larger number of years.

5.3 Non-financial public benefits

Many of higher education's public benefits are not primarily financial. These benefits include pro-social behaviours such as general volunteering, civic engagement and tolerance – features of what the base funding review panel calls "a more robust civil society".[42] Strong results on these social indicators are typically features of well-functioning societies.[43] However, valuing their impact is difficult. It cannot easily be converted to dollars, or any other common metric. Unlike Chapman and Lounkaew (2012), *Graduate Winners* will make only qualitative judgments.

On a range of indicators, graduates show at least slightly higher levels of pro-social behaviour than people with other education levels. But just as prior ability influences how much graduates

[41] Chapman and Lounkaew (2011), p 19
[42] Lomax-Smith, *et al.* (2011), p 102
[43] Halpern (2005)

earn, other prior attributes influence their broader engagement with society. We need to determine whether higher education adds value on top of whatever other attributes a graduate may already possess. As with prior ability, identifying and quantifying a distinct higher education effect is difficult.

Ideally we would compare two groups of people, identical except for their level of education. In practice, this ideal test condition rarely occurs. But we can use the background characteristics collected in various social surveys to statistically adjust for their effects. These include age, gender, whether the respondent was born outside Australia (or other culturally similar countries), income (personal, household or both), the respondent's level of schooling, their number of children, and their marital status. Where available in particular surveys, other factors are included. A separate technical paper – *Non-financial benefits of higher education* – is available for readers interested in the detail. What follows presents basic descriptive statistics, with the text explaining whether other factors appear to account for the observed differences.

5.3.1 Volunteering

Volunteers make their time and skills available to a range of community organisations. As table 6 shows, higher education graduates are more likely than non-graduates to be volunteers. The higher probability of graduates volunteering was confirmed after statistically controlling for other background factors.[44]

However, among volunteers graduates do not spend more time on their voluntary activity.

Table 6 – Volunteering in Australia (2010)

	Fortnightly or more	Ever in last year
Postgraduate degree	20%	48%
Bachelor degree	19%	46%
Advanced diploma/diploma	19%	44%
Certificate III/IV	16%	35%
Certificate I/II	17%	29%
Year 12	15%	31%
Year 11	17%	31%
Year 10	14%	27%
Year 9	12%	21%
Year 8 or below	11%	19%

Note: *Volunteering defined as unpaid voluntary work given in the form of time, service or skills to a club, organisation or association.*
Source: *ABS (2011b)*

The General Social Survey includes a question on field of study, which showed that the overall rate of graduate volunteering appears to be driven by particular sub-groups. This varies with the type of organisation the graduate volunteers for, but generally people with degrees in education, social sciences, agriculture and health were most likely to volunteer. Those with degrees in

[44] Using some overlapping and some different background variables, the positive association between volunteering and being a graduate was confirmed in the General Society Survey (GSS) and the Household, Income and Labour Dynamics in Australia survey (HILDA).

science, IT, engineering and architecture were less likely to volunteer.

Additional education gives people skills that they can contribute to the community. However, most graduates did not volunteer in the 12 months prior to the General Social Survey being conducted, and only one in five volunteer regularly. The differences between fields of study suggest that underlying career choices (see section 6.2 for more detail) may be more important than higher education. For example, people attracted to "social" occupations in education and health may also be more inclined to volunteer.

5.3.2 Civic engagement

In the United States, there is a clear link between higher education and civic engagement.[45] People with college degrees are more likely to inform themselves about political matters, and more likely to vote. In Australia, compulsory voting means that this is not a good indicator of civic engagement. However, survey evidence gives us other measures, such as involvement in organisations with a civic or political role.

In Australia, graduates are more likely to read the political content of newspapers, after taking into account other factors that may influence political interest.[46] However, being male, older and completing year 12 also have large effects. Having a degree predicts the frequency of reading a newspaper's political content to about the same extent as being 10 years older. In another survey, respondents were asked a series of basic questions about Australian political institutions. Overall, graduates were more likely than non-graduates to give correct answers. However, many graduates lack accurate detailed political knowledge. For example, a large minority of graduates wrongly believe that the maximum time between federal elections is four years.[47]

People with university degrees are more likely to belong to organisations with a civic or political role, such as a trade union or technical association, an animal welfare group, a human rights group, or other civic or political organisations. However, controlling for whether the survey respondent participated in group activities as a child (like sports, dance, or scouting groups) decreases the university effect. A positive university effect remains only for some types of civic group membership.[48] Much of the additional civic involvement of graduates carries forward family practices of group involvement.

The public benefit from additional involvement of graduates in civic groups is modest. Fortunately, Australia's civic culture is widespread. It does not rely on an experience that until the last few decades was open to only a small minority of the population. This explains why Australian has run a successful democracy since the 19th century. Civic education needs to be open to all, and is rightly focused on schools, which provide the most universal education experience.

[45] Dee (2003)
[46] Wilson, *et al.* (2005)
[47] McAllister, *et al.* (2011)
[48] ABS (2011b)

5.4 Tolerance

In multi-ethnic and multi-faith countries, tolerance is important to the smooth functioning of society. Conflict is likely to be minimised when different groups are accepting of each other. Graduates are more likely than non-graduates to agree with the general proposition that is a good thing for society to be made up of different cultures. This remained true after the comparison group was narrowed to people who were similar to graduates, other than their education level.[49] An increased belief that it is good for society to be made up of different cultures depends on the graduate's friends being similarly educated (friendship networks tend to be educationally similar). However, higher education may not improve tolerance if it does not increase social interaction with similarly educated people. Online education may therefore not have the same socialising effects as on-campus education. Australia's "commuter" model of on-campus education may not have as much impact as the American residential colleges.

Social distance surveys offer more nuanced measures of attitudinal differences. Regarding different minority groups, these surveys ask respondents to nominate their feelings: the surveys give a range of options, from "welcome as family member" to "keep out of Australia altogether". When they ask about specific groups, they let us take into account attitudinal differences between groups. Graduates are much more likely than people with no post-school education to express high levels of acceptance of ethnic and religious groups (Figure 16). Only a minority of people without post-school education want any of the groups excluded from Australian society. However, they prefer more distant relationships than family or friendship.

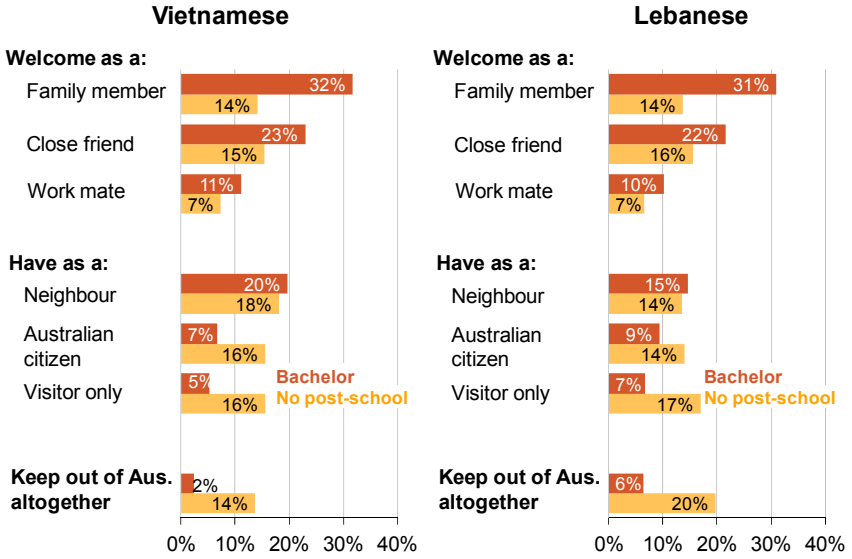
For most ethnic or religious groups, however, it is not clear that higher education *causes* these attitudinal differences. Males and older people are less accepting than females and younger people. The differences in the raw data are therefore partly attributable to the fact that graduates are younger and more female than the population as a whole. University education at the bachelor degree level is associated with about the same increase in acceptance as being male decreases it.

When graduates are compared to otherwise similar people who did not attend university, attitudes to other groups are much the same. In a social distance survey, attitudes to all the religious groups examined were very similar (including Muslims, Jews, Hindus, Buddhists and various Christian groups). Among ethnic groups, attitudes to Indigenous people were also very similar. Only in attitudes towards Lebanese and Vietnamese people is it likely that there is a small difference in attitudes.

The social distance questionnaire in the Australian Survey of Social Attitudes suggests that while bachelor-degree graduates may not be much more likely to be more accepting of minorities, people with postgraduate qualifications are likely to be more accepting. This may be due to additional education, or it could be some other aspect of people who go on to acquire postgraduate qualifications.

[49] The question was from the General Social Survey, ibid. See *Detailed Non-Financial Analysis*

Figure 16 – Tolerance of Vietnamese and Lebanese people
% who felt comfortable with various levels of social distance



Source: AUSSA 2007

5.5 Lower crime rates

The base funding review suggests that lower crime rates are a public benefit from expanding higher education.[50] It does not elaborate on the idea, but education may reduce crime by improving legal income opportunities, by providing better peer groups, and by occupying young men's time. If so, it would be a significant public benefit, sparing other members of society the cost and distress of being a victim of crime, and the negative effects of fearing crime. It would also save on police, court and prison costs.

In Australia, graduates have low incarceration rates. Only 2 per cent of prison entrants in 2009 had a degree. By contrast, in that year 23 per cent of the working age population had a degree.[51] Prisoners are only a sub-set of the criminal population, which includes defendants found guilty but not jailed, and people who are not caught. Education data is lacking for these groups, though admitted illicit drug use differs little by educational level.[52] However, for custodial crimes (mostly violent crimes and drug trafficking[53]) graduates are clearly under-represented relative to their share of the population.

Whether a causal relationship exists between more higher education and less crime is less clear. In crime as in other social outcomes, graduates are not a random group in the population. On average they have superior cognitive and non-cognitive skills, which would give them opportunities to live well within the law, whether or not they attend university. People who lack skills valued in the labour market have a greater incentive to turn to crime. In other parts of this report, year 12 school completers are used as the comparison group. This group is relatively rare in the prison entrant population, at less than 20 per cent in 2009, compared to about 70 per cent of the general working age population.

[50] Lomax-Smith, *et al.* (2011), p 103

[51] AIHW (2010), p 22, ABS (2011a), Table 8
[52] AIHW (2011), p 92
[53] ABS (2012a)

Crime is a complex phenomenon that does not always move in predictable ways with other social and economic trends. Education and crime increased together in Australia until about 2000, when crime started trending down.[54] Declining opportunities for lower-skilled work, especially for men, probably helps explain why some acquired more education, and others turned to crime. However, higher education is not the most plausible educational policy response for people "at risk" of criminal activity. As the prisoner statistics show, their school completion rates are low and so they lack the usual prerequisite for higher education entry. Educational public benefits from less crime are likely to come from school completion more than higher education.[55]

5.6 Discipline-specific public benefits

The literature on higher education public benefits focuses on attributes of graduates in general, rather than on specific disciplinary skills and knowledge. As these are usually rewarded in the labour market (section 6.1), the general focus is mostly warranted. Graduates can convert their skills and knowledge into private benefits through higher salaries, which also pay for the benefits produced without raising a case for additional public contributions. However, as 6.1 will show, graduates in some disciplines earn less than others. The issue becomes whether the skills and knowledge of graduates with lesser earnings are under-priced by the market.

The under-pricing could occur because general benefits are not always specifically rewarded in the labour market. The American philosopher Martha Nussbaum, for example, argues that an education in the liberal arts is valuable for democracy and the "creation of a decent world culture". She argues that a liberal arts education fosters critical thinking and the transcending of local loyalties.[56] However, humanities graduates typically earn less than other graduates. If Nussbaum's argument is right, it may be that employers pay humanities graduates less than the value of their benefits to society.

In the social service labour market for the health, welfare and education sectors employees are often modestly paid, at least compared to other graduates. In these markets the client group may be unable to afford the fees necessary for high wages, or government as a dominant employer may be able to keep wages down. Arguably, these markets exploit the altruistic motives of people attracted to the helping professions. In the fairness framework outlined in section 4.3, this may create a case for a tuition subsidy.

In section 7, the report looks at the specific example of nursing. However, where employers use but under-reward specific skills, the labour rather than the higher education market would be the best point of intervention. Labour market interventions target the graduates delivering the benefit, while tuition subsidies target graduates who happen to study for the relevant qualification. Benefits for the public, and rewards for the graduate, can be delivered more accurately through the labour market. Using the higher education market for intervention would be a gesture when

[54] AIC (2012)
[55] An idea supported by international research: Lochner and Moretti (2002); Meghir, *et al.* (2012)

[56] Nussbaum (2010). She does not put this is a context of support for public funding, noting that alumni of American universities tend to be more ready to provide financial support for this type of education than governments.

career higher wages cannot be afforded. Or it could reflect institutional design issues, such as in Australia where state governments are the direct employers of most social service staff, while the federal government funds higher education.

5.7 How much does the scale of public benefits matter?

In the base funding review's framework, the scale of public benefits from higher education matters a lot. The general public pays students the approximate value of their anticipated public benefit production. If the value of the public benefits is high, then so is the payment to students. If the value of the public benefits is low, then so is the payment to students.

In valuing higher education's financial public benefits, the base funding review panel used a reliable source, the HILDA survey. The problem is that the figure they arrived at is an average of all graduates. As section 6.1 shows, large financial public benefit differences exist between disciplines. On the logic of the base funding review framework, these differences should be reflected in tuition subsidy levels. The flat 60% public and 40% private funding ratio that it recommends cannot do this.

The base funding review panel acknowledges that estimating higher education's non-financial public benefits is inherently difficult. Their underlying research relies heavily on overseas studies to guide them through this complexity.

This approach led them to over-state higher education's non-financial public benefits. *Graduate Winners* has examined the available Australian data on many of the same areas. The differences between graduates and non-graduates are not always large, and factors other than higher education often explain the differences that exist.

If the Government proceeds with the base funding review's recommendations, it should use Australian estimates of non-financial public benefits, and use discipline-level data on financial public benefits.

The base funding review panel's approach also omits public policy efficiency considerations. If the policy goal is reduced crime, efficiency requires targeting the people most at risk of committing crime. As section 5.5 shows, it is people with year 10 or below school education who are disproportionately convicted for the most serious crimes. Education as a crime prevention strategy needs to help young people with poor school results. Young people with the academic and other abilities needed for higher education are already much lower risks to the community.

Similarly, this group is not the most obvious target if the public policy goal is increased tolerance. Generally they are likely to already have relatively tolerant attitudes. Policies aimed at increasing tolerance need to be aimed at the general community or specific groups identified as particularly troublesome.

In the *Graduate Winners* framework, if efficiency considerations can be met the scale of public benefits initially affects whether a field of study is a candidate for tuition subsidy. The public benefit's value to society must exceed tuition subsidy costs. This value requires a political judgment, given how difficult it is to put a monetary price on non-financial benefits. Within this constraint, tuition subsidy levels depend on how much it takes to change behaviour, not the public benefit's size. Section 8 looks at the

impact of price changes on student choices.

5.8 Public benefits and fairness

Fairness claims to compensation for public benefit production should be restricted to discipline-specific public benefits. There are major objections to paying graduates for general public benefits.

For the general public benefits described in this section – volunteering, tolerance and lower crime – the pro-social behaviours are not unique to graduates. Many other Australians volunteer and tolerate people different to themselves. Most other Australians are not criminals. There is no obvious reason why graduates alone should be compensated for their good activities, while other people doing the same thing should not.

Similarly with financial public benefits, many non-graduates make substantial contributions to tax revenues. Australian Taxation Office Statistics show that the top 10% of income earners pay 45% of all income tax.[57] In the 2006 census, nearly half of all people reporting incomes in the relevant categories did not have degrees. It is difficult to see why graduates deserve special rewards for making significant tax contributions when a similar number of non-graduates do the same.

Also, it is not clear why all graduates should be rewarded for activities of only some graduates. Graduates volunteer more often than other members of the community, but still most do not volunteer. Graduates are more tolerant than other members of the Australian society, but some are intolerant. Graduates are less likely to go to jail than other Australians, but some do and crimes such as illicit drug use vary little by education.

Discipline-specific public benefits, by contrast, are more robust to these objections. Where benefits are tightly related to specific knowledge or skills, graduates contribute benefits that non-graduates cannot, or non-graduates cannot achieve to the same standards. Tuition subsidies may not be the most efficient way of rewarding discipline-specific public benefits, as graduates are not obliged to work in their area of education. However, some form or reward for graduates could be justified.

[57] ATO (2009), personal tax, table 9

6. What are higher education's private benefits?

Higher education offers significant financial and non-financial private benefits. In the policy framework outlined in section 4 private benefits – whether directly from the course, from the market, or from government – motivate most students to undertake higher education.

Financial private benefits receive much attention: they are important to some students, they are important to government (because they produce tax revenues), and they can be adjusted by government through subsidies and taxes. Financial private benefits tell us about the capacity of students to pay for their higher education. These private financial benefits are discussed in section 6.1.

However, private financial benefits *under-explain* observed behaviour in higher education markets. Not all students maximise their lifetime earnings, as measured by the courses they could have taken, given their school results. Some disciplines are consistently popular despite not reliably leading to well-paid jobs. A course is more than a means to a monetary end. Non-financial benefits are explored in section 6.2.

6.1 Financial benefits

A large body of Australian evidence suggests that graduates earn above-average wages. For women, the median bachelor-degree holder earns roughly $800,000 dollars more in a lifetime than the average year 12 graduate who completes no further study. For men, the lifetime income gap between a bachelor degree and year 12 is $1.1 million (see table 7).

In percentage terms, these are large numbers: the median man with a bachelor degree earns 65% more over a lifetime than a median year-12 completer who does no further study. For women the difference is nearly 80%.

Table 7 – Median gross lifetime income by level of education

	Male	Female
Year 12	$1,697,851	$1,005,823
Diploma/ Advanced Diploma	$2,301,109	$1,398,498
Bachelor degree	$2,814,296	$1,806,449
Difference between Year 12 and Bachelor	*$1,116,445*	*$800,626*

Note: *Calculations cover ages 18 to 65. In the case of bachelor degrees, students are assumed to study for four years. For diplomas, students are assumed to study for 1 year.*

Source: *2006 Census (using the ABS TableBuilder)*

Variation across and within disciplines

While graduates have high earnings *on average*, table 7 hides some large variations. First, there is variation across levels of education. Some people who do no further study post year 12 do better financially than many graduates. Second, there is variation across disciplines. Lawyers, for example, tend to do better in the labour market than humanities students. Last, there is variation within disciplines: the average corporate lawyer earns a lot more than the average family lawyer.

Figure 17 presents a more nuanced picture of the wage benefits associated with higher education. The figure shows the differences in the lifetime earnings of the 20th percentile (i.e. people on the cusp of the bottom fifth, compared to their peers) and the 60th percentile (i.e. people moderately above the middle of their group).[58]

The contribution universities make to higher wages

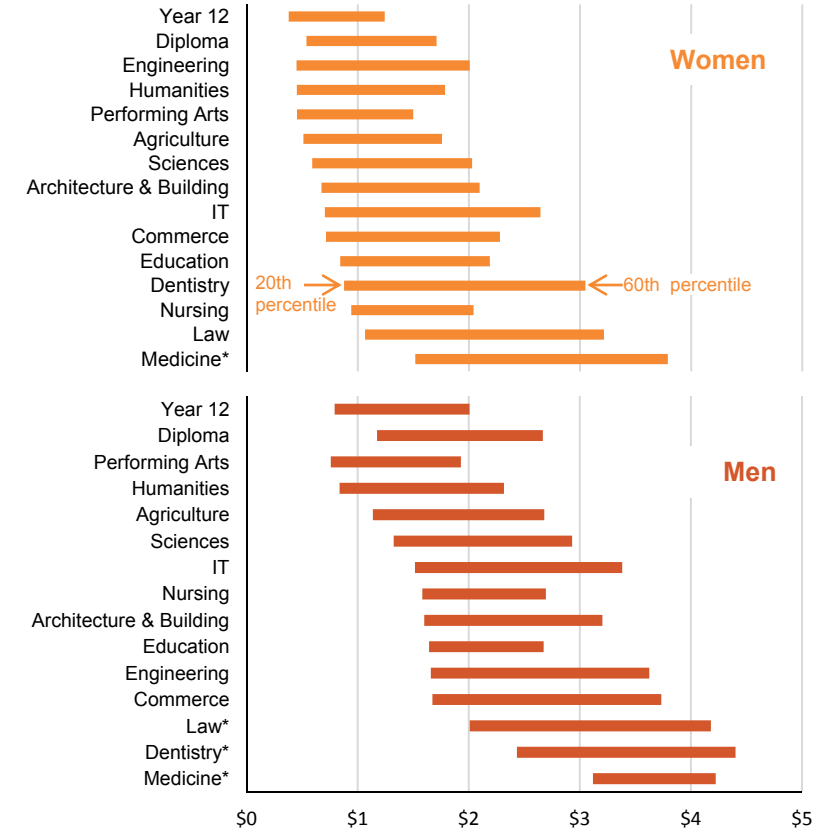
Not all of the wage difference between graduates' and non-graduates' lifetime earnings can be attributed to higher education. As suggested in section 5.1, graduate wages may be higher due to a series of effects: a training effect; an ability-based selection effect; and a signalling effect.

In calculating the private financial benefits of higher education, this report considers the training effect (as in section 5 when analysing public financial benefits) and the signalling effect.

Without universities, graduates would have neither the extra capacities they gain at university (training), nor a credential that distinguishes them in the labour market (signalling).

In contrast, higher pay based on prior ability should not be included in the private financial benefits of higher education.it is therefore necessary to discount the wage premium graduates receive on account of their (hypothesised) above-average capabilities.

Figure 17 – Spread of gross lifetime earnings: 20th – 60th percentile
Millions of dollars



Notes: *Diploma includes advanced diploma and associate degree; 'Science' excludes maths;*The highest income category in the census is >$2,000 which applies at some point to the 60th percentile in disciplines with an asterisk. The limit also explains why the ranges are constrained at the 60th percentile.*

Source: *Grattan calculations based on 2006 Census (using the ABS TableBuilder)*

[58] In this context, 'peers' and a 'group' refers to a level (and field) of education, e.g. 'science bachelor degree holders'.

Unsurprisingly, evidence is inconclusive on the extent to which graduate wage premiums are driven by the above-average capabilities of university students. This report follows the review of Andrew Leigh (2008) and reduces extra earnings by 10% to account for pre-existing ability. As there are a range of possible discounts for ability, the supporting document *Detailed Financial Analysis* presents results when this reduction is 40% of the extra earnings graduates receive.[59]

Adding in the costs

In addition to the private financial benefits of education, costs also need to be considered. From a student's point of view, these costs include not just direct costs (e.g. tuition payments) but also the lost income a student would have earned if they had decided not to study (usually defined as the median earnings of year 12 completers of the same sex who did not attend university).

The most common way to compare the costs with the benefits is to think about education as an investment. To assess whether the investment makes financial sense, costs (i.e. the direct cost of study and forgone wages) are compared with the long-term benefits (i.e. whatever wage premium graduates earn after university). This analysis generates an 'internal rate of return' – a method discussed at length in the detailed analysis document.

Estimates of the internal rate of return for higher education in Australia suggest that the decision to attend university is financially sound. Generally, graduates receive a healthy net private benefit. This is illustrated by table 8 which presents a summary of recent Australian studies estimating the average return for investment in an undergraduate degree.

Table 8 – Previous estimates of 'returns' for an undergraduate degree

Study	Data from	Gender	Return
Borland et al. (2000)	1997	Both	12%
Wei (2010)	2006	Males	15%
		Females	17%
Daly et al. (2012)	2006	Males	15%
		Females	12%

Notes: *Assumptions differ across these studies which make comparisons difficult.*
Sources: *Borland et al. (2000); Wei (2010); Daly et al. (2012)*

A number of studies have drilled down into these aggregate results and investigated the internal rates of return for specific disciplines. For a majority of disciplines, estimates reflect the strong returns presented in table 8. For the median graduate returns range from good (e.g. nursing) to excellent (e.g. dentistry).[60]

[59] This is taken as a rough upper bound – as reported in Leigh (2008) and based on an estimate using an 'instrumental variable' methodology. (Note that the 'instrument' in this case for the level of education people had was the month they were born in). For an explanation, see Leigh and Ryan (2008).

[60] It's worth noting that these returns are only calculated for students who successfully graduate. This overstates both the private and the public benefits of university, as the analysis is conditional on success.Recent figures suggest that, five years after commencing, 78% of students have either graduated or are still enrolled (Lomax-Smith, *et al.* (2011), p 79). A counterbalancing factor is that as this analysis only looks at people whose highest degree is a bachelor degree. It therefore misses the positive effect of undergraduate study on postgraduate degree holders.

There are exceptions to the general picture of healthy returns. The median male humanities graduate, for example, has only a marginally better financial outlook than a non-graduate. More pointedly, Daly *et al.* (2012) suggest that the rate of return for a visual and performing arts graduate could not be calculated – i.e. that the investment in a visual and performing arts degree had negative financial value.

Variation of returns within disciplines

In most studies, internal rates of return are only presented for the median earnings outcome. This tells us whether the median dentistry or humanities graduate benefits financially from his or her degree, but provides no information on the range of graduate outcomes within each discipline.

An exception is Daly *et al.* (2012) which, along with presenting median results, includes estimated returns for graduates in the 20th percentile of their discipline's income spectrum.[61] In contrast to the strong financial returns for the median graduate, the financial outlook for the 20th percentile was poor for almost all disciplines. At the 20th percentile, all graduates outside medicine and dentistry would have been better off financially not attending university.[62]

[61] Daly, *et al.* (2012), p 23.
[62] That is, they did worse financially than the median non-graduate with a year 12 education.

Breakeven analysis

To better understand income variation within disciplines, Grattan researchers estimated the internal rates of return for graduates at every decile and across a wide range of fields. These results, along with a detailed discussion of methodology and assumptions, are presented in *Detailed Financial Analysis*.

This report presents the results in terms of a **breakeven point** .For each discipline this identifies the point in the income distribution (for each cohort[63]) at which the financial benefits of university outweigh the costs. Stated more precisely, it identifies the lowest decile for which the net present value of studying is positive. It answers the question: how well do students need to do to make study financially worthwhile?

Take the example of commerce. As might be expected, a commerce degree significantly increases lifetime earnings potential – and the returns for the median commerce graduate are high. As a result, table 9 (over the page) shows that across all commerce graduates even someone at the 30th percentile ends up financially better off than the median non-graduate.

In other words, in a sample of 100 commerce graduates, the 70th lowest earner is better off financially than the median year 12 completer (of the same sex) who went straight to the workforce. This includes commerce graduates who choose relatively low-earning jobs (e.g. being an accountant for a charity) along with those people who have a commerce degree but do not work full time.

[63] 'Cohort' here describes a discipline for each gender, e.g. male creative arts graduates.

To contrast that with the case of men studying performing arts, a majority end up financially worse-off post university. Only men in the 60th percentile of performing arts graduates (and above) end up financially ahead of the median man who went straight to the workforce.

(For the sake of comparison with previous research, and with numbers presented in section 5, table 9 also includes estimates of the 'net financial benefits' in dollar terms for the median outcome in each discipline).

Table 9 – Breakeven analysis

Discipline	Gender	Breakeven Percentile (Lowest decile with positive NPV)	Median Net financial benefits
Agriculture	F	40th	$205,445
	M	40th	$320,387
Commerce	F	30th	$501,757
	M	30th	$806,693
Dentistry	F	30th	$855,076
	M	20th	$1,323,083
Education	F	30th	$503,231
	M	30th	$404,913
Engineering	F	40th	$331,712
	M	30th	$771,701
Humanities	F	40th	$236,161
	M	50th	$107,065
IT	F	30th	$693,625
	M	30th	$677,134
Law	F	20th	$973,483
	M	20th	$1,180,143
Mathematics	F	40th	$522,778
	M	30th	$578,680
Medicine	F	20th	$1,244,669
	M	10th	$1,262,014
Nursing	F	30th	$446,356
	M	30th	$408,527
Performing arts	F	50th	$112,806
	M	60th	-$69,873
Sciences (excl. maths)	F	40th	$365,800
	M	30th	$458,624
Bachelor degree average	F	30th	**$442,174**
	M	30th	**$606,693**

Notes: *10% discount for ability bias as per discussion in section 6.1. The comparison point is the gender-specific income of the median year 12 completer who completed no further study; Students begin studying at age 18 and retire at 65; no income during the study period; students pay 2006 HECS-HELP charges; no discount rate over time. No time discount.*

Sources: *For sources see the* Detailed Financial Analysis *document*

6.2 Non-financial private benefits

Most graduates earn good incomes. However, some fields of study – for example humanities and performing arts – are at high risk of low private financial benefits (as shown in table 9). Money alone cannot explain why students take these courses. Nor can financial factors fully explain other course choices. As figure 17 shows (page 52), some courses lead to careers with considerably overlapping earnings profiles. Lifetime income does not provide a reason for choosing one rather than another. Non-financial private benefits are needed to explain student behaviour.

6.2.1 Fulfilling careers

Most recent graduates offer job-related factors as their main reason for studying.[64] As section 6.1 shows, graduates typically earn more than non-graduates, and this presumably influences their decision to attend university (though money's influence is curiously under-researched). But a job is more than a means to money. Whether work is interesting, enjoyable and meaningful is important to overall quality of life.[65]

On these dimensions, there is no clear hierarchy of jobs. A good match between jobs and workers matters more to a good working life than external measures of job desirability, such as pay or social status. Career choices are linked to personality types and ability levels, and so matching needs to co-ordinate both. The best-known typology matching personality and career, devised by the American academic John Holland, divides occupations on what is known as the RIASEC typology, after the first letters of the following:

Realistic: includes occupations where people work with their hands such as building, repairing, and making objects.

Investigative: includes occupations where workers experiment, research, and analyse.

Artistic: includes occupations involving painting, writing, sculpting, dancing, and playing music.

Social: includes occupations directed towards helping others.

Enterprising: includes occupations oriented to organising others and selling.

Conventional: includes occupations to do with record keeping and organising information.[66]

Within all these categories except the first, which matches with non-higher education occupations, higher education qualifications generally increase job possibilities. Higher education therefore should improve a person's chance of finding a job that matches with their broad aptitudes and preferences. However, it may also increase their risk of a job that does not use all their skills and abilities.

Australian research shows that the RIASEC categories are strongly associated with course choices. Year 12 students were

[64] ABS (2010), Table 5

[65] In Australian research, overall job satisfaction ranked 5th of 18 possible factors in its correlation with overall life satisfaction: Gong*, et al.* (2011), p 12

[66] Adapted from Harvey-Beavis and Elsworth (1998), p 12

given a personality test to classify their broad RIASEC type, and asked about their courses preferences. Those with investigative interests mostly intended applying for engineering, IT or science courses. Around half of students with artistic interests intended to apply for visual arts or music courses, while a significant minority intended to apply for the humanities and social sciences. Those with social interests mostly intended applying for health, teaching, child care, and community service courses. Those with enterprising interests mostly intended applying for humanities and social science courses. Those with conventional interests mostly intended applying for business, law, and library courses. In every category, however, there were some students for whom the personality test was not predictive of intended courses choices.[67]

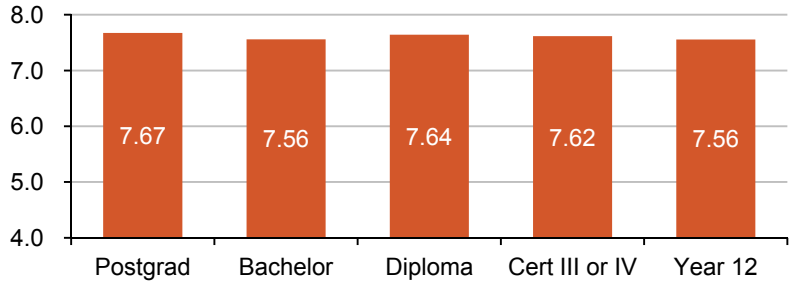
Despite higher education's potential to improve job matching, the satisfaction evidence is mixed. Postgraduates are more likely than other workers to agree strongly that their job is interesting, helps others and is useful to society (table 10). Their jobs may be more meaningful as a result. However, for bachelor degree holders these self-perceived job attributes are generally not markedly different from otherwise similar people. Bachelor-degree holders are more likely than similar people to believe that their job is useful to society, but they are not more likely to say that it is interesting or that it helps others. Bachelor-degree graduates are not more satisfied with their jobs than people with other educational qualifications (figure 18). Analysis of HILDA data suggests unfulfilled higher wage expectations among graduates may contribute to this counter-intuitive finding.

Table 10 – Whether job helps others, is useful, or interesting

	Job can help other people		Job is useful to society		Job is interesting	
Qualification	Strongly agree	Agree	Strongly agree	Agree	Strongly agree	Agree
No post-school qualification	17%	50%	15%	41%	9%	55%
Trade qualification or apprenticeship	8%	66%	13%	50%	11%	63%
Certificate or diploma	23%	55%	24%	46%	18%	58%
Bachelor degree	23%	52%	24%	46%	18%	64%
Postgrad degree or diploma	35%	50%	40%	47%	31%	51%

Source: Wilson et al. (2005)

Figure 18 – Job satisfaction
Average self-reported job satisfaction



Question: "How satisfied are you with the work itself (what you do)?" 0=satisfied, 10=completely satisfied
Source: HILDA 2010

[67] Ibid. pp 21-31

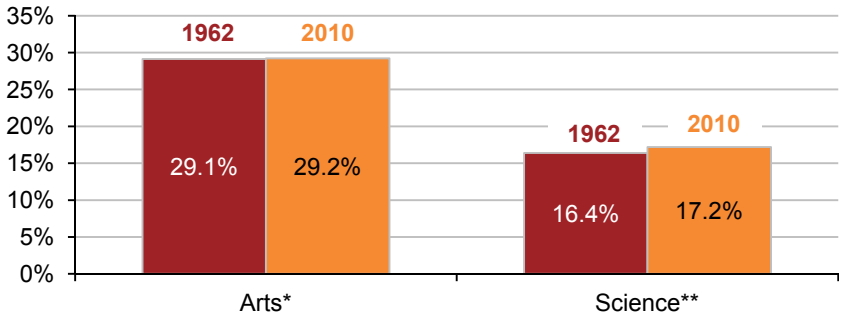
6.2.2 Intrinsic interest and enjoyment

Most research into higher education's private financial benefits – including in this report – counts the years spent at university as a financial cost. Full-time students forgo income and incur expenses for three or four years, in the hope of benefits later on. However, not all of higher education's benefits are postponed. For many students, higher education is a valuable experience in itself.

The RIASEC theory of job matching applies to study as well. University is not just a route to a job. It is the start of long-term engagement with a subject that most students find interesting. Indeed, satisfying interests rates slightly more highly than job factors in a survey of first-year students. Their most important reasons for enrolling were "studying in a field that really interests me" (96%), "improving my job prospects" (86%), "developing my interests and creative abilities" (77%), and "to get training for a specific job" (75%).[68]

Rating interests above jobs is consistent with students deliberately choosing courses without clear vocational pathways.[69] Though comparisons are complicated by changes to the way students and courses are categorised and counted, figure 19 shows that generalist degrees have maintained their share of domestic undergraduate enrolment over time. While some students end up in arts or science courses as a second preference after a vocational degree, together arts and science receive a third of all first-preference applications.[70]

Figure 19 – Enrolment share for arts and science
% of domestic undergraduate students



Notes: **2010 Arts includes the ABS categories 'Society and Culture' (minus sub-categories law and economics); and 'Creative Arts', **The 2010 Science number includes IT (which makes up 3% of students)*
Sources: Macmillan (1968), DEEWR (2010) Table 4.5: Actual Student Load (EFTSL)

These fields also attract very able students. Table 11 (over the page) shows ATARs for school leavers entering science and arts courses in 2010. For example, half of all students enrolling in maths courses had an ATAR of 90 or above. This puts them in the top 10% of their age cohort by school performance. The top 10% of students enrolling in language and literature courses had an ATAR of at least 97, putting them in the top 3% of their age cohort by academic ability. Particularly in the sciences, students with

[68] Krause, *et al.* (2010), p 18
[69] In some cases, combined or double degrees help students pursue interests without risking future employability.
[70] Following the way applications are reported, this figure includes creative arts and economics in the ABS 'society and culture' category, but excludes law: DEEWR (2011c)

many alternative options choose a general course. This behaviour cannot be explained only by a desire to maximise future income.

When students pursue their interests it is a "consumption" benefit of higher education – something they enjoy now, rather than an investment in future income. A survey of year 12 students planning on going to university overwhelmingly responded positively to the proposition that their preferred field of study looked like a "fun subject to study".[71] A study that tracked young people from year 9 at school to their mid-twenties found that those who would eventually complete an undergraduate degree were happier than other young people until around age 23, when their happiness declined to around the average for the whole group.[72] At least for school-leaver university students, their university years are good. They study something that interests them, and often have plenty of free time for socialising and pursuing other goals.

Table 11 – ATAR entry requirements for Arts and Science (2010)

	Median	90th percentile
Mathematical Sciences	90	98
Physics and Astronomy	88	98
Chemical Sciences	86	97
Earth Sciences	79	93
Biological Sciences	82	94
Political Science and Policy Studies	88	98
Studies in Human Society	86	97
Philosophy and Religious Studies	77	94
Language and Literature	83	97

Source: DEEWR special data request

[71] Roy Morgan Research (2009), Table 28
[72] Dockery (2010)

6.2.3 Status

According to a year 12 student survey, substantial minorities are attracted to courses by the "social status" of work in that field.[73] Status is subjective. Individuals have high status because they are rated or regarded highly compared to other people. While status often has objective correlates – persons with certain characteristics tend to be ranked more highly in their community – these can change over time. For example, earlier status differences between races and sexes have diminished or disappeared.

Higher education in itself may have lost status as it became more common. In the 1970s only a few per cent of the adult population held a degree; more than a third of young adults did so by 2011.[74] Young people from working class families are now much more likely to go to university than people from any background within living memory (table 2, page 31). At least in middle-class families the pressure to go to university has increased. There may be a loss of communal standing from not enrolling, rather than a gain from doing so.[75] For those who continue their education, there are hierarchies of institutions and courses, with many students wanting to "get the most out of likely year 12 result".[76]

[73] Roy Morgan Research (2009), Table 28
[74] Census data from earlier years, for more recent years ABS (2011a), Table 8
[75] 63% of year 12 students from high SES areas agree with the proposition that "it seems to be the natural thing to go onto university after school"; compared to 42% of year 12 students from low SES areas: Roy Morgan Research (2009), Table 17
[76] Ibid. Table 28

Recent Australian surveys have not investigated ratings of profession by status. Official occupational status scales use education and income to rank occupations: they assume rather than show that these factors drive real-world status.[77] There is however research on self-assessed status. Australians tend to rate themselves around the middle of the societal status system. On a one to ten scale, most people put their social position between five and seven. So while self-rated status does vary in the expected order between education levels (table 12), the differences are small. Graduates in occupations for which they are "over-qualified", primarily clerical and community or personal service jobs, rate their status as 6.1, below appropriately-qualified graduates, but above people with other qualifications.

Table 12 – Self assessed status by post-school education

Post-school education	Self-assessed status
None	5.7
Trade qualification or apprenticeship	5.9
TAFE certificate or diploma	6.0
Bachelor degree	6.6
Postgraduate degree	6.8

Source: Evans, A. (2010)

6.2.4 Life satisfaction

By many conventional indicators, graduates enjoy good lives. But in Australia they do not necessarily experience higher life satisfaction. When asked questions like "all things considered, how satisfied are you with your life?" graduates are not necessarily more satisfied with their lives than non-graduates. In two out of the three Australian surveys examined there was no higher education benefit.[78] People of all education levels report average satisfaction levels within the "normal" range of 7 to 8 on a 0 to 10 scale.

We would not necessarily want education levels to influence overall life satisfaction to a large extent. That would mean luck – the favourable genes and a good social environment when young that heavily influence educational outcomes – translated into outcomes across a range of life domains. And nor would we necessarily expect education to have a major effect, since it cannot easily affect major determinants of self-assessed well-being, such as personality type.

Any effects of education on life satisfaction are likely to be indirect. These could be through increased opportunities for positive life experiences that may improve well-being, such as better jobs, higher incomes, or greater social opportunities. Or education might help reduce the risk of negative life experiences, such as unemployment, poor health, or weak social connections. On all these indicators, higher education has the expected positive effects.

Using HILDA data, a group of researchers at NATSEM, a University of Canberra centre for social and economic statistics, argue that the relationship between education and life satisfaction is complicated by differences between older and younger people. People born before 1955 have higher life satisfaction across all

[77] McMillan, *et al.* (2009)

[78] Savage (2012). No result in HILDA and AuSSA, a positive result in GSS.

educational levels than those born after 1955. In the older groups, people with year 11 education or below, the most common educational level, are more satisfied with their lives than graduates. In the younger age group, graduates are slightly more satisfied with their lives than people with other levels of education, and especially those with year 11 education or below.[79]

The overall differences between age groups may reflect the "U" pattern of well-being identified in many countries. Younger and older people are the most happy, with people in the middle years less happy. NATSEM's very wide definition of "young" (born after 1955) may obscure this. There may also be "cohort" effects, with generational differences in how life is perceived.

Life satisfaction differences within the younger age group are most relevant to policymaking and young people making choices about their future. Though life satisfaction differences between graduates and non-graduates are small compared to the income differences, higher education is likely to improve life satisfaction for today's school leavers.

6.2.5 Better health

The base funding review suggests that higher education provides benefits through better personal and family health.[80] If there is a *causal* link between higher education and health, this is both a private and public benefit. The graduate will avoid unnecessary suffering, and governments will reduce health expenditure, at least until later in the graduate's life.

An international literature review shows an association between more education and relatively good health.[81] However, showing that higher education *produces* additional health public benefits is more difficult to demonstrate. The causal pathway runs in part from health to education, not the other way around: better childhood health results in more education.[82] Personality traits such as self-control and a future orientation may contribute to both better health and higher educational achievement, though American research has not been able to demonstrate this.[83]

Three surveys – the General Social Survey 2010, HILDA 2010, and the Australian Survey of Social Attitudes 2005 – have questions asking respondents to rate their own health on a five-point scale from "poor" to "excellent". In all three there was a statistically significant association between higher education and better self-reported health, compared to otherwise similar people. In the GSS, this appears to be driven by graduates of education, social sciences, and management. In the AuSSA 2005, and similarly to the GSS, the result seems to be largely driven by graduates in education, social sciences, and creative arts.

In addition to self-reported health, the HILDA survey asks respondents to record their height and weight. This data is used to calculate a Body Mass Index (BMI). A high BMI indicates that someone is overweight or obese, which puts them at greater risk of a range of medical conditions. Our analysis suggests that university education is associated with decreased BMI. There are potentially large upsides from reducing BMI by even a modest

[79] Gong, *et al.* (2011)
[80] Lomax-Smith, *et al.* (2011), p 136. Public health was also included in calculations of total public benefits: Chapman and Lounkaew (2011), p 19
[81] Cutler and Lleras-Muney (2012)
[82] Ibid. pp 9-12
[83] Cutler and Lleras-Muney (2010)

amount, especially when young. One study found that a one-point reduction in BMI in a young person may increase their life expectancy by up to two years.[84]

6.3 Conclusion

In applying the policy framework in section 4, each course's private benefits need to be understood. In the market failure part of the analysis, knowledge of private benefits helps us predict patterns of demand for courses. A purely financial analysis will under-predict demand, given the powerful role of interests in driving student choices. Similarly, policy interventions to increase demand need to be based on both financial and non-financial considerations. Potential higher education students will not always be aware of all courses that match their interests. Advertising and outreach will be more effective in these cases. Demand for a course must exist before changing its price can have an effect. In some cases, occupational status issues may be a problem. Various calls to increase the status of teaching as a profession reflect the idea that the problem is not just cost.

Some private benefits, such as improved health, are probably not top-of-mind for young people considering their post-school options. And realistically, almost anyone can reduce their risk of ill health and aid their recovery from illness using readily available information. However, the health advantages accruing to graduates need to be included when deciding whether there is a fairness case for public subsidy. They are another dimension in which graduates are already typically better off than other members of the community.

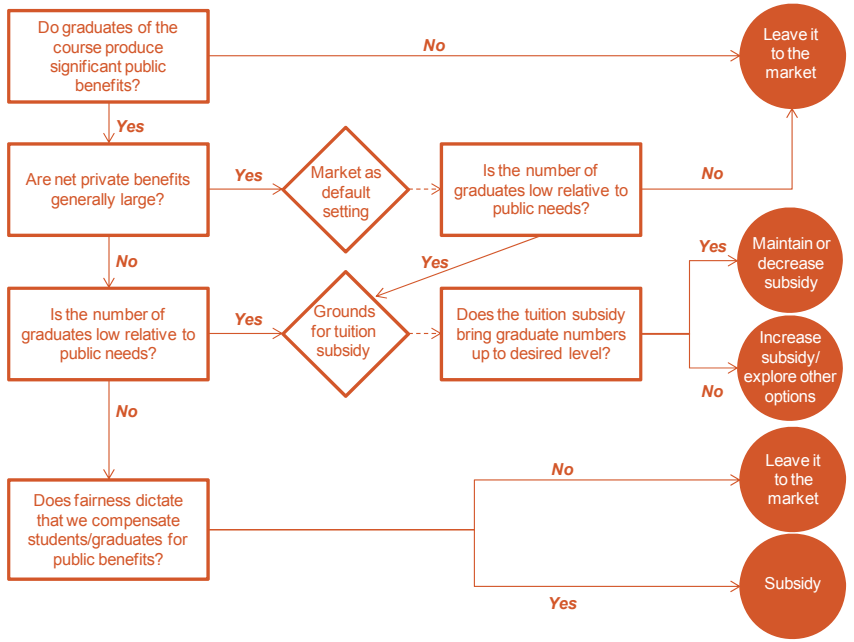
[84] Fontaine, *et al.* (2003)

7. Applying the public tuition subsidy framework

Having presented a range of analytical results about the public and private benefits of higher education, *Graduate Winners* returns to the practical question of funding.

This section combines the first-principles policy thinking introduced in section 4 (and reproduced in summary form in figure 11) with the empirical evidence on public and private benefits presented in sections 5 and 6. A full analysis of the different disciplines is beyond the scope of this paper. This section uses three examples – engineering, nursing, and visual and performing arts – that illustrate different aspects of how the framework might work. Readers can however do their own analysis on other disciplines using this framework. The discipline-level public and private benefits statistics in this paper can be combined with employment and demand data that is readily available elsewhere.[85]

Figure 20 – A method of thinking through subsidies



7.1 Engineering

Engineering skills are obviously important to the construction, operation and maintenance of Australia's infrastructure. This includes government-owned infrastructure provided to the public at no or low direct cost, as well as privately-owned infrastructure for which users are charged a commercial price. Engineering largely operates as a for-profit business. It does not rely on engineers having charitable or altruistic motives.

[85] DEEWR (2011c); DEEWR (2011b)

On top of the benefits to the public via commercially provided engineering services, engineering graduates also satisfy the significant public benefit test set out in figure 20 through paying income tax. As table 13 illustrates, the median male engineer pays over $400,000 more than the median year 12 completer in tax. In the higher percentiles, engineers make very large contributions to tax revenues. However, engineers are less likely than graduates in other fields to volunteer.

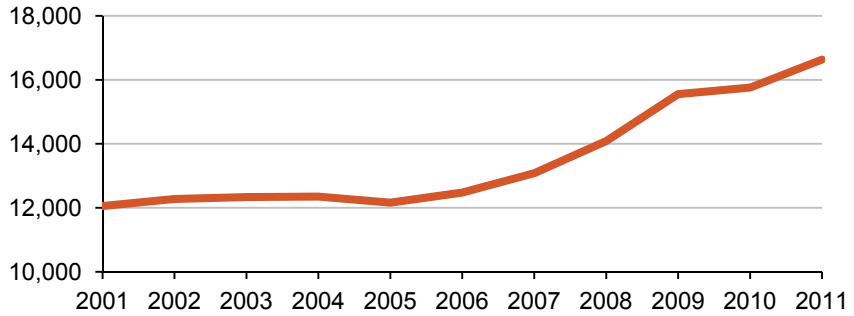
Paying a large amount of income tax is, of course, the flipside of high private financial returns, also shown in table 13. High salaries provide a substantial incentive to take engineering courses. In applications statistics going back nearly 20 years, engineering has consistently had an applications market share of between 5 per cent and 7 per cent of school leaver applicants. Applications for engineering courses have increased since the mid-2000s, probably reflecting the mining boom (figure 21). In the *Graduate Winners* framework for public tuition subsidy, engineering looks like an attractive financial option, with or without a tuition subsidy.

Table 13 – Median public and private financial benefits of engineering (compared to year 12 completion only)

	Women	Men
Net private financial benefits*	$331,712	$771,701
Net public financial benefits**	$149,221	$426,592

Note: **discounted 10% for ability bias, as discussed in section 6.1; **includes 100% of net tax benefits (i.e. makes NO adjustment for ability or signalling effect). This is the most generous set of assumptions for the net tax benefit figure.*
Source: *See section 5.1 and the Detailed Financial Analysis document.*

Figure 21 – Demand for engineering courses
Number of applications



Note: *Engineering demand appears to have had another strong increase in 2012, but at the time of publication the available statistics include all applicants, while the time series in the figure is for "eligible" applicants. The main difference is that the eligible applicants time series omits some applicants with weak school results.*
Source: *DEEWR (2011c)*

Though engineering's private financial benefits are high, Australia has fewer engineers than employers would like. Table 14 (over the page) shows that civil, electrical and mining engineers have been in short supply since the mid-2000s. As section 4.3.3 explains (on page 33), recruitment difficulties do not necessarily show a problem with the education system. Universities cannot produce experienced graduates; nor can they guarantee that workers will stay in a profession. Unsatisfactory wages or conditions are not the fault of the higher education system.

In engineering, however, there is strong demand for new graduates as well as experienced workers. Less than 2 per cent of 2010's mining engineering graduates were still looking for full-time work in early 2011, compared to more than 20 per cent of

graduates generally. Other recent engineering graduates also enjoyed much better full-time employment rates than graduates generally.[86] The professional association for engineers predicts that demand for engineering workers will exceed domestic supply into the future, and urges continued access to the global labour market through favourable migration criteria.[87]

On the *Graduate Winners* framework for public tuition subsidy, this is the kind of scenario in which a "market failure" may exist. If engineering demand was soft, tuition subsidies or some other intervention could be used to boost demand for and supply of engineering places. In practice, demand for engineering courses continues to grow strongly without policy change. However engineering faces strong competition from other courses for applicants with strong mathematics skills, especially science courses. Applications for science courses have grown more quickly than engineering applications in recent years. Yet engineering more reliably delivers public benefits, reflected in greater demand for its graduates and higher tax contributions.

Growth in science applications highlights the dangers of poorly designed government interventions. In 2009, science went from the same student contribution rate as engineering to a much lower rate. Demand for science has been very strong ever since (see section 8.2.2), though there are no general shortages of science graduates. The government plans to bring the science student contribution back up to the same level as engineering.

[86] GCA (2011a)
[87] Engineers Australia (2012)

Table 14 – Engineering skills shortages 2004-11

	04	05	06	07	08	09	10	11
Chemical engineer		●	●	●	●	●		
Civil engineer	X	X	X	X	X	●	●	●
Electrical engineer		●	●	●	●	●	●	●
Mining engineer		X	X	X	X	●	●	X

● indicates that the industry reported shortages in general
X indicates that the industry reported shortages and that more than 95% of graduates in the discipline were being employed
Sources: GCA (2011b), DEEWR (2011b)

7.2 Nursing

Almost everyone in Australia will be treated or cared for by a nurse at some time. The benefits provided by nurses are extensive and essential. Compared to other graduates, however, their chances of earning high incomes are low (figure 17, page 52). Intuitively, this combination of major benefits to others and relatively low private benefit makes nurses one of the more "deserving" student recipients of public assistance through tuition subsidies. Yet the base funding review panel endorsed a recommendation that, in proposed reforms to the student pricing system, nurses pay more (figure 10, page 23 shows the proposed changes).

Applying the *Graduate Winners* framework, nurses clearly satisfy the public benefit test. As table 15 shows (over the page), nursing's public financial benefits are around $205,000 per graduate, compared to the median person with year 12 schooling but no further education. People with health qualifications also have relatively high rates of volunteering, another public benefit (section 5.3.1).

Table 15 – Median public and private financial benefits of nursing (compared to year 12 completion only)

	Women	Men
Private financial benefits*	$446,356	$408,527
Public financial benefits**	$202,212	$210,431

Note: **discounted 10% for ability bias, as discussed in section 6.1; **includes 100% of net tax benefits (i.e. makes NO adjustment for ability or signalling effect). This is the most generous set of assumptions for the net tax benefit figure.*
Source: *See section 5.1 and the Detailed Financial Analysis document.*

Nurses' private financial benefits are positive. Our 2006 estimate is that the median nurse is $400,000-450,000 better off over their career, compared to the counter-factual of no further education after completing school. However, other graduates earn much more. The private financial benefits accruing to the median nurse are less than 40% of those accruing to the median doctor. For financially motivated prospective students, the private benefit comparison point may be other higher education courses rather than no course. Therefore the other options available to nursing students need to be examined.

To investigate these options, information on the year 12 ranks of students entering various courses over the period 2001 to 2010 was used. In this period, the median student entering nursing had an ATAR (previously UAI, TER or ENTER) of 74. Only a few courses had lower median ATARs—social work, agriculture, some education courses (but not the main teacher education courses) and a couple of other small fields. The graduates of these courses do not earn substantially more than nurses, and often they earn significantly less. However, a wider range of fields of study admitted some students with ATARs below 74, even though this was not typical. The main areas which admitted students below 74 and whose graduates earn more than nurses are IT, engineering and business courses. Other health fields such as medicine, dentistry, radiography, physiotherapy and optical science were out of reach for the median nursing student.

Realistically, the median nursing student has few more lucrative course choices. Prospective nursing students are likely to be oriented towards "social" occupations (section 6.2), so it is unlikely that IT or engineering courses would appeal. Possibly business courses would suit some nursing students, though the 2006 census suggests that only about 4% of people with nursing qualifications are employed in business or management roles outside the health sector. Given their year 12 results and career preferences, nursing students are generally taking the course that will deliver them the best financial results.

Though private benefits for nurses are positive, the number of graduates is low relative to public needs. Nursing and related occupations persistently feature on the skills shortages list, with strong demand for graduates as well as experienced nurses (table 16, over the page). Weak demand for nursing places is at least one possible cause. As with engineering, however, student demand has responded to labour market demand. Applications for nursing doubled in a decade (figure 22, over the page).

A particularly large increase in demand for nursing is observed between 2009 and 2010. What this says about responsiveness to price is unclear. Over 2009-10 nursing student contributions increased by $1,000 per year, but nursing graduates became eligible for HECS-HELP debt reductions of around $1,600 a year, if they worked as nurses. The debt reduction lowers the long-term cost of a nursing degree, except for graduates who pursue

alternative careers. However neither reform was well publicised and what prospective students who were aware of the changes made of increased nominal but decreased effective costs is unclear. Ignorance and confusion may have prevailed. If so, the applications increase was largely coincidental.

Table 16 – Skills shortages in nursing 2004-11

	04	05	06	07	08	09	10	11
Midwife	●	●	●	●	●	●	●	●
Registered nurse	X	X	X	X	X	X	●	●

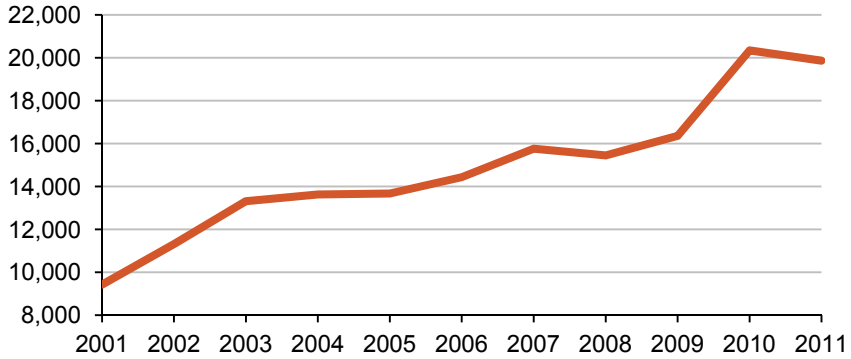
● indicates that the industry reported shortages in general

X indicates that the industry reported shortages and that more than 95% of graduates in the discipline were being employed

Sources: GCA (2011b), DEEWR (2011b)

Figure 22 – Demand for nursing places

Number of applications



Source: DEEWR (2011c)

Whether or not the HECS-HELP debt reduction was a successful "market failure" intervention, is there a fairness case for paying tuition subsidies for nursing students? The free-rider framework needs a belief that nurses are rewarded too little for their work. Nursing attracts people who prefer social helping activities (which is also seen in their volunteering). Possibly hospitals are able to "exploit" nurses' goodwill with modest salaries. Nurses themselves are substantially less likely than workers generally to say that they are satisfied with their pay and conditions.[88] It would not be surprising if the Australian public was sympathetic to their cause. However, our research did not identifiy any Australian public opinion research on nurse salaries.

It is easier to see how free-rider arguments apply to nurses more than to doctors, the best-paid profession. Governments may have used their market power as the principal employers of nurses to keep wages down. Doctors have more employment alternatives through private practice, so it has been harder for governments to control their incomes. Generous tuition subsidies for nurses would in a modest way redress the imbalances in health workforce incomes (presuming medical courses were not supported to the same extent). In Australia, there are also jurisdictional issues, with state governments the main employer of nurses, and the federal government the main funder of higher education. The federal government cannot directly increase the pay of nurses, but it can improve their financial position in other ways.

However, it is also possible to argue against a special deal for nursing on fairness grounds. As noted, nurses typically do not have many better-paid alternatives. Indeed, female nurses

[88] Holland, *et al.* (2012), p 22. Though conducted by academics independently of the Australian Nursing Federation, this was a convenience sample of nurses visiting the ANF website. It is therefore possible that the sample was biased towards disgruntled nurses.

working full-time do reasonably well compared to the median income of other female graduates (though fewer of them have very high incomes). Female nurses have higher than usual rates of part-time work, which brings their total income down. But, given skills shortages this work pattern is likely to be largely a matter of choice, to fit with family or other responsibilities. This kind of low income does not need supplementing through education subsidies.

Only sub-sets of the nursing profession make apparent financial sacrifices to do the job. About 10% of nurses are male, and most earn less than the median male graduate. The top 10% of students enrolling in nursing degrees (of either sex) have ATARs of 90 or above, which widen their choices well beyond nursing. However, all entrants to a field of study should not be rewarded on fairness grounds for the actions of small minorities.

If nurses are under-paid, it is relative more to their work's social value than to other female graduates. However, tuition subsidies are not an effective way of solving this problem. As section 8 shows in more details, course costs cannot radically change the lifetime financial rewards of choosing one degree over another. They are too small relative to earnings over multi-decade careers. Tuition subsidies can also be poorly targeted, as not everyone with a nursing (or any other degree) works in their field of qualification. Only salary changes can more effectively recognise the social value of nursing.

7.3 Performing arts

Australian performing arts graduates contribute to the Australian cultural and entertainment industries. Through their TV, film, stage and other appearances, some performing arts graduates are well-known to members of the general public. It is very unlikely that any other field of study has graduates whose names are as widely known outside their own profession or industry. Performing arts graduates are more likely than graduates of other fields to have fans who derive significant pleasure from their work.

Yet on other measures of public benefit, performing arts graduates make smaller contributions than graduates in other fields. Indeed, the tax contribution of performing arts graduates is lower than for any other field of study (see table 3, page 41). Even at the 40th percentile of the visual and performing arts income distribution, a male visual and performing arts graduate is paying less than the median male who completed his education at year 12. Only at the 60th percentile is the taxpayer likely to be financially ahead on a male visual and performing arts graduate, after taking into account the original costs of the years spent studying.

The performing arts financial public benefit comes principally through a small proportion of its graduates. While most doctors and nurses contribute and receive benefits through practice in their professions, performing arts labour markets tend to be "winner take all". In these labour markets, a small percentage of top performers take a large percentage of total financial rewards (and pay most of the tax). For example, actors with multi-million dollar contracts are greatly outnumbered by actors who struggle with irregular work and small, poorly-paid roles. The well-paid performers are also those that reach the largest audiences.

The 2006 census shows that graduates in the performing arts have low rates of full-time employment. Only a third of female

graduates and half of male graduates have full-time work. Less than 15 per cent work in the broad "arts and recreation services" industry. More teach than perform, with about 30% of performing arts graduates employed in the "education and training" industry. However, most work in industries that are not obviously related to their original field of study. The struggles of most graduates in these fields are reflected in the low private financial returns shown in section 6.1.

Table 17 – Median public and private financial benefits of performing arts (compared to year 12 completion only)

	Women	Men
Private financial benefits*	$112,806	-$69,873
Public financial benefits**	$28,274	-$39,207

Note: **discounted 10% for ability bias, as discussed in section 6.1; **includes 100% of net tax benefits (i.e. makes NO adjustment for ability or signalling effect). This is the most generous set of assumptions for the net tax benefit figure.*
Source: *See section 5.1 and the Detailed Financial Analysis document.*

While financial benefits are low, possibly the non-financial private benefits are larger in the performing arts than for other disciplines. Its courses provide opportunities for artistic self-expression that other courses cannot. More than in other areas professionalised through university study, the performing arts preserve significant non-professional production and consumption. People become involved because they enjoy it. The arts can provide their own rewards. For the individual, they do not need to attract large audiences, make money, or provide other benefits.

For the purposes of *Graduate Winners* framework analysis, whether we conclude that private benefits are high or low takes us on slightly different paths to the same question about public needs. If we assume that combined financial and non-financial private benefits are high – an inference from student demand rather than the financial statistics[89] – then the market is the default policy setting, with a question about public needs for graduates to establish whether that demand is great enough. It we assume that the private benefits are not large, we have no default bias towards a market outcome, and go straight to a question about the number of graduates relative to public needs.

The labour market evidence shows no general shortages of graduates in the performing arts. Related occupations never appear on skills shortages list (though very specific positions may be hard to fill), and most existing graduates work outside their field. The performing arts industry is global one with a long history, so in mass-produced formats there is already much more available than any one individual could consume in a lifetime. There is no "market failure" in the usual sense of the term, and therefore this rationale provides no obvious case for public tuition subsidy.

An argument that performing arts graduate "over-production" (relative to public rather than private needs) is desirable would need to rely on the idiosyncratic nature of this labour market. While skill, talent and effort are usually necessary for success in the performing arts labour market, compared to other labour markets these indicators are weak predictors of success. Some able and hard-working performers find large audiences, while many others do not. And some less-able performers – at least as

[89] The broad "creative arts" category has received about 28,000 applicants in recent years. Demand significantly exceeds supply, with 32% of applicants receiving no offer: DEEWR (2011c), pp 31-33

judged by their peers or critics – become popular. Other than in hindsight, it is hard to identify who will fall into which category. Because predicting success is difficult, we need lots of starters. Performing arts education reflects the quasi-lottery nature of the industry. Many more need to play than can win.

Is it fair to performing arts students to make them pay the full cost of such risks? Presumably they would argue that it is not. But from a public policy perspective, they are not fulfilling major needs that are likely to otherwise go unmet. The public is not asking them to make sacrifices. And arguably the public cost of their choice goes well beyond the annual $11,200 tuition subsidy for the time they spend at university. Table 3 (on page 41) shows that the median male performing arts graduate generates less tax revenue than someone who finished their education at year 12. The cost in foregone tax revenue would be much larger if they were compared to the average graduate.

The purposes of higher education are broad, including a wide range of public and private benefits. But the purpose of higher education policy intervention is to produce public benefits. Educational options with no or negative public benefits are legitimate individual choices. But in the *Graduate Winners* framework these options should be pursued at private expense, for private benefit.

8. The impact of subsidies

The first-principles analysis in section 4 and subsequent empirical analysis suggests that for some disciplines the level of tuition subsidies may not be justified. This is because the public benefits are not high enough (section 5), or because the private benefits are high enough to attract students without tuition subsidies (section 6). This raises the obvious question, what would happen if tuition subsidies were reduced?

As discussed in section 6 student behaviour is not driven only by financial considerations. Nonetheless, increasing the amount of money students pay may influence their decision to attend university, or which course they study.

First, increases in student contributions may alter the underlying economics such that university no longer makes financial sense – leading some students to make an informed choice not to attend. Second, students might *perceive* that increases in the level of student contribution shift the balance of cost and benefits (even if the underlying economics have not substantially changed) which may discourage potential applicants.

This section analyses both possibilities. It starts by investigating whether changes in student contributions lead to large changes in the underlying economics of undergraduate study. It then looks at the history of price changes in Australia to see if they have induced a behavioural response (either in total applications or among particular disciplines). The section concludes by outlining a possible mechanism to change pricing over time.

8.1 The economics of changing tuition subsidies

To explore how tuition subsidy levels affect the underlying economics of going to university, this section investigates the impact student charges have on our "breakeven analysis" (see section 6.1 and the *Detailed Financial Analysis* document*).*[90]

We consider four starkly different scenarios about the amount students pay:

1. Free (setting student charges to zero)
2. HECS-HELP levels (the actual charges in 2006 – our baseline assumption, in which students pay for some of their education)
3. Full Commonwealth funding rate (the total funding received by universities for each place – i.e. students pay the full cost)
4. International student fees (which are generally above the Commonwealth funding rate)

These fee levels are presented by discipline in table 18. table 19 (on page 74) illustrates how these different prices affect our 'breakeven analysis' for various disciplines (originally discussed in section 6.1). The most striking thing about these breakeven results is how robust they are to changes in student charges. Few of the breakeven deciles shift as a result of large changes in student charges. Our scenarios range from completely free

[90] Recall that for each discipline there is a distribution of incomes, and that "breakeven analysis" identifies the income decile students must reach (relative to their cohort) for the financial benefits of study to outweigh the financial costs.

education (on the far left of table 19, page 74) to fees being set at international student levels (on the right).

The breakeven percentiles might change slightly, but our analysis is only able to capture a decile shift. For example, if increasing the student contribution changed the breakeven percentile from the 24th to the 28th percentile – the (rounded) breakeven point in our analysis would stay at the 30th percentile, i.e. the 3rd decile.[91] But, if the breakeven point went from the 29th to the 31st percentile, the breakeven decile would move from the 30th to the 40th percentile.

To explain the insensitivity of breakeven percentiles to student fees consider dentistry, which is one of the most expensive degrees: it is a long course (5 years) and the international fee rate in 2006 was very high (around $40,000 per annum). The difference between the scenarios "free education" and "international fees" is roughly $200,000. While this is a very large sum of money, for male graduates the breakeven decile in both scenarios is the 20th percentile. That is, a low-earning dentist (someone just above the bottom fifth of the dentist income distribution) ends up better off than the median year 12 completer regardless if they pay $0, or $200,000.

The reason for this is that these 'low-earning' male dentists have an expected lifetime earnings of $2.8 million. With this income, a student contribution of $200,000 represents around 7% of lifetime gross income.

Table 18 – Scenarios of annual student contributions

		Price scenarios			
Discipline*	Duration (years)	1. 'Free' education	2. HECS-HELP	3. Full-CSP rate	4. International fees
Agriculture	4	$0	$6,979	$24,093	$19,642
Architecture and building	5	$0	$6,979	$14,695	$19,129
Commerce	3	$0	$6,979	$9,568	$17,005
Dentistry	5	$0	$8,170	$24,269	$43,552
Economics	3	$0	$6,979	$9,568	$17,005
Education	4	$0	$3,920	$11,534	$15,550
Engineering	4	$0	$6,979	$19,823	$20,526
Humanities	3	$0	$4,899	$9,263	$15,451
IT	3	$0	$6,979	$14,695	$18,492
Law	3	$0	$8,170	$9,744	$19,564
Mathematics	3	$0	$6,979	$12,132	$19,790**
Medicine	5	$0	$8,170	$24,269	$43,552
Nursing	3	$0	$3,920	$14,097	$17,059
Performing arts	3	$0	$4,899	$14,388	$16,528
Sciences (excl. maths)	3	$0	$6,979	$19,823	$19,790

Note: **See Detailed Financial Analysis for definitions of study areas; **Figure for mathematics represents average international student charge for natural and physical sciences*

Sources: *Daly et al. (2012)*; *DEEWR (2008);* University websites

[91] In *Detailed Financial Analysis* the results are presented as 'internal rates of return'; this measure is also very robust to changes in student contribution.

Moreover, the difference between the income of the 20th percentile male dentist ($2.8 million) and the median year 12 completer ($2.0 million) is around $800,000. So, even if low-income male dentists paid 100% of the cost of providing their degree plus some significant margin, their wage premium is around four times their total student contribution.

A similar logic applies to graduates in other disciplines. In the case of education, total tuition costs in our assumptions range from $0 to $60,000 (the latter assuming a four degree at the international student rate of around $15,000, as outlined in table 18). Across this range of prices, the breakeven decile for females remains at the 30th percentile. At this point in the income spectrum, the expected lifetime gross income is $1.5 million. For the median woman who finishes education in year 12, the expected lifetime gross income is $1.2 million. The difference of $300,000 is much greater than the largest realistic student charge of $60,000. For female education graduates at the 20th percentile (below the breakeven point), the gross lifetime income is $1.0 million – well below the median expectation of year 12 completers, regardless of tuition costs.

Put simply, then, most people benefit financially from university. If they do not, then they probably would not have, no matter what student fees they paid. In the context of income-contingent loans, student contributions do little to change the underlying economics of studying, which are driven by the discipline a student chooses and how well they do in the labour market within that discipline.

This analysis suggests that student fees have at most a limited effect on the financial impact university has on students. Although this may surprise some, it is not a new result. Previous analyses of student charges under a HECS-style scheme have suggested that fees have only a modest effect on students' financial outlook. Chapman and Ryan (2005), for example, concluded that the introduction of HECS reduced the average returns to graduates by less than 1%.[92]

For an analysis of how 'internal rates of return' (as opposed to 'breakeven percentiles') are affected by our assumptions, see the *Detailed Financial Analysis* document. Both measures are very robust to large changes in the level of student contributions.

[92] See Chapman and Ryan (2005), Table 2. For an analysis of how returns (as opposed to breakeven points) are affected by our assumptions, see *Detailed Financial Analysis.*

Table 19 – Impact of student charges on lifetime breakeven points

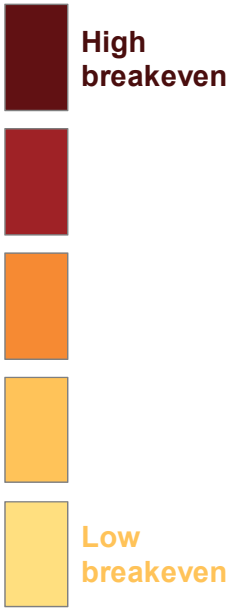
Breakeven percentile (ROUNDED TO DECILES)

Scenarios to investigate the effect of how much students pay

Low student fees ← → High student fees

Discipline	Gender	1. "Free university"	2. 2006 HELP rates	3. Students pay full cost	4. International student rates
Agriculture	F	40th	40th	40th	40th
	M	40th	40th	40th	40th
Architecture	F	40th	40th	40th	40th
	M	30th	30th	40th	40th
Commerce	F	30th	30th	30th	30th
	M	30th	30th	30th	30th
Dentistry	F	30th	30th	30th	30th
	M	20th	20th	20th	20th
Education	F	30th	30th	30th	30th
	M	30th	30th	30th	30th
Engineering	F	40th	40th	40th	40th
	M	30th	30th	30th	30th
Humanities	F	40th	40th	40th	40th
	M	50th	50th	50th	50th
IT	F	30th	30th	30th	30th
	M	30th	30th	30th	30th
Law	F	20th	20th	20th	20th
	M	20th	20th	20th	20th
Medicine	F	20th	20th	20th	20th
	M	10th	10th	10th	10th
Nursing	F	30th	30th	30th	30th
	M	30th	30th	30th	30th
Performing arts	F	50th	50th	50th	50th
	M	60th	60th	60th	60th
Sciences (excl. maths)	F	40th	40th	40th	40th
	M	30th	30th	40th	40th
Average bachelor graduate	F	30th	30th	30th	30th
	M	30th	30th	30th	30th

Definition of breakeven point: *For each discipline, the point in the income distribution (relative to students' peers) where the benefits of study outweigh the costs. It answers the question: within their cohort, how well do students need to do to make study financially worthwhile?*



Note: *For a description of the methodology see Detailed Financial Analysis. These results make no adjustment for ability bias. Students are assumed to begin studying at age 18 and retire at 65; no income during the study period*

8.2 Evidence on price sensitivity

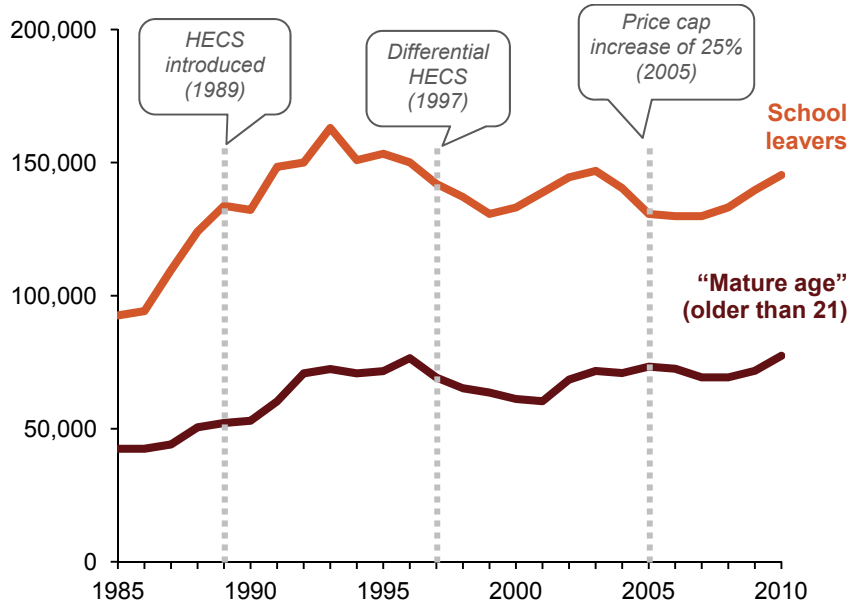
The previous section showed the limited impact of student charges on the long-term financial attractiveness of higher education. However, student charges may still exert an influence on whether students apply. Many prospective students will have only a partial understanding of the costs and benefits of studying. Evidence from Canada suggests that people systematically overestimate the costs while underestimating the benefits.[93] Some prospective students may incorrectly conclude that fees are so high that study is not in their financial interests.

To understand whether changes in price would lead to changes in the number of people applying to university, we need to understand how responsive students actually are to student charges (regardless of how charges affect the underlying economics).

History here offers something of a guide. As discussed in section 2, student charges have increased several times since their introduction in 1989. To see how these price changes have affected the level of applications, figure 23 tracks the total number of university applicants from 1985 to 2010, and highlights the points when charges underwent significant change.[94]

At an aggregate level, analyses of these data offer mixed results. Whether the three main price changes (in 1989, 1997 and 2005) caused significant reductions in the number of applicants is unclear, given other trends at the same time. In 1997 and 2005, applications were already trending down before student charges increased. Applications are influenced by the labour market, which is the major alternative activity to further education. The number of school leavers also affects the number of potential applicants.

Figure 23 – Applications over time



Source: Vice Chancellors' Committee Report, as cited in Deloitte Access Economics (2011c)

[93] Usher (2005)
[94] As the overall number of student places has been controlled by agreements between government and universities, the number of applicants is the best available measure of 'demand'.

8.2.1 Particular groups of students

In theory, mature age students may be more sensitive to price because they have fewer working years left than school leavers. If they are already working, they may also have to start repaying their HECS-HELP debt before they finish their courses (in 2012-13, this applies to people earning more than $49,000).

However the evidence is contradictory on whether price increases have disproportionately discouraged school leavers or mature age students. Les Andrews (1997), for example, found that the number of school-leaver applicants significantly declined in response to the 1989 changes, but not the 1997 increases. In contrast, Phil Aungles et al. (2002) found that the 1997 changes did significantly reduce school-leaver applications, but that the 1989 changes did not. These analyses, along with a paper commissioned by the base funding review, are summarised in table 20.

To put give some context to the numbers in table 20, in 1996 the total number of school-leavers who applied for undergraduate courses was around 150,000. The result from Aungles *et al.* (2002) that around nine thousand fewer school-leavers applied in 1997 due to HECS increases, therefore equates to a drop of roughly 6 per cent.

Table 20 – Have previous HECS/student contribution increases discouraged applicants?
School leaver applicants (estimated effect size in brackets)*

	Year of price change		
	1989	**1997**	**2005**
Andrews (1997)	Decline of roughly 20,000 applicants	No significant effect	n.a.
Aungles *et al.* (2002)	No significant effect	Significant drop (around 9,000 applicants)	n.a.
Deloitte Access Economics (2011c)	n.a.	No significant effect	Significant drop (around 16,500 applicants)

Mature-age applicants (estimated effect size in brackets)*

Andrews (1997)	No significant effect	Significant drop (around fewer 10,000 applicants)	n.a.
Aungles *et al.* (2002)	Significant **increase** (around 9,500 more applicants)	Significant drop (around 17,000 applicants)	n.a.
Deloitte Access Economics (2011c)	n.a.	Significant drop (around 12,000 applicants)	No significant effect

Note: **We have strong reservations about the size of the above estimates*[95]
Sources: *Andrews (1997); Aungles et al. (2002); Deloitte Access Economics (2011b)*

[95] There are a number of concerns with these estimates – many of which stem from data limitations. In the case of the Deloitte Access Economics paper, for example, the dummy variables are not well specified to test the hypothesis that increases in student contribution rates reduce demand. There is also a lack of testing for co-integration, which is a possibility given the nature of the data.

One issue with applications figures is that they include people with a weak commitment to higher education. Around 30 per cent of people who are offered a university place reject it. Of those who accept, 11 to 15 per cent (in surveys between 1994 and 2009) say they are just marking time while they decide on their future.[96] People who are just keeping their options open are likely to be more price sensitive than those with clear career plans.

As section 6.2.2 argues, some people study primarily out of interest in a field of study. They do not expect a financial return from their degree, and therefore have more reason to be price sensitive than vocationally-oriented students. They get higher education as "consumption" but not as an investment in future income. For other students, higher education is consumption and an investment that will pay for itself in the future.

The available studies do not explore the behaviour of people who are not pursuing vocational outcomes, who are not identified in the applications statistics. However, they are probably over-represented in the applicants for humanities and performing arts courses. Applicant numbers for these courses did decline in 1997 and 2005, and by a larger percentage than for other courses.[97]

Another under-studied group is people with weak school results. Application rates have always declined with ATARs, with more than 95% of high ATAR (80+) school leavers applying for university, compared to less than half of those with ATARs below 50. This is a rational response to risk. Students with lower ATARs have a higher probability of course non-completion. Only half of people with ATARs between 30 and 59 who started university in 2005 had completed by 2010. For people with ATARs above 90, 85% had completed.[98] Given the danger of non-completion, low ATAR students would prudently be more price sensitive, as their gains are less certain. Consistent with this theory, low ATAR applications declined more than high ATAR applications with the 2005 increase in student contributions.[99]

8.2.2 Changing the relative prices of disciplines

In addition to the broad changes in student contributions discussed above (in 1989, 1997 and 2005), on several occasions specific disciplines have become cheaper or more expensive. In 2009, for example, mathematics, statistics and science courses were added to the "national priorities list", which resulted in a reduction of the maximum annual student contribution from $7,260 in 2008 to $4,162 in 2009. Figure 24 (over the page) presents relative student contributions – i.e. the student charge for particular disciplines compared to the average – in a number of areas that have seen large price shifts.

Have these changes resulted in a behavioural response? Once again, evidence is limited and results are mixed. The most comprehensive study of relative price changes is Deloitte Access Economics (2011b). In the case of science, Deloitte's results suggest that the reduction in student contributions *did* result in an uptick in the proportion of science applicants. They concluded that "the 11% increase in the relative share of sciences following the

[96] DEEWR (2011c), p 20; Krause*, et al.* (2010), p 19
[97] DEEWR (2011c)
[98] Data taken from Lomax-Smith*, et al.* (2011), figure 4.3, p 80.
[99] DEEWR (2011c), p 103. Three-quarters of the decline in school leaver applications was among applicants with ATARs of 70 or below.

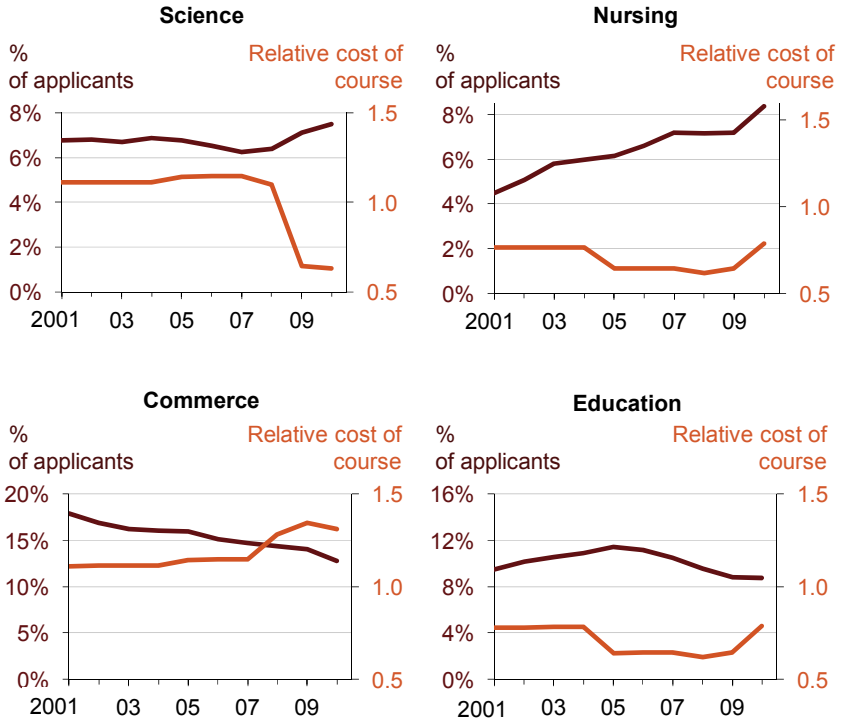
2009 HECS policy change was a direct result of the inclusion of science on the national priorities list". Although this causal claim is very strong, science increased its share of applications in both 2010 and 2011, so it is difficult to rule out the possibility that the large and well-publicised decrease in student contributions spurred applications.

However, in other areas that experienced significant changes in student contributions, Deloitte Access Economics was unable to find evidence that these changes shifted the mix of applications. In the case of education and nursing, lower student contributions from 2005-09 were found to have no significant effect on applications. Moreover, when the student contribution for nursing increased in 2010, so did demand for nursing (as noted in section 7.2, there was also a complicating change to HELP repayment obligations).

This mixed evidence mirrors the research on how student contributions affect the overall number of applications. It is consistent with the idea that for prospective students, fees are not necessarily a primary consideration in deciding whether or to continue their education. As discussed in section 6, many students focus more on finding a discipline (and ultimately, a career) that matches their interests, ability level and personality.

Given the many considerations involved in deciding whether or not to go on to higher education, uncertainty around price sensitivity will always exist. However, the following generalisations flow from theory and the historical evidence:

Figure 24 – Relative prices vs applications



Note: The data represents the discipline-specific student fee divided by the weighted average student contribution. Calculation of this weighted average assumes that in 2005 all universities increased the student contribution by the maximum 25%, which was true in most cases.

Source: The charge for each band and the allocation of disciplines to bands was from Universities Australia (2010). Weights were derived from the uCube service on DEEWR's website.

1. Relative changes in prices may result in small shifts of applicants from one discipline to another, especially in instances where there are close substitutes (such as science and engineering). If students can get want they want out of higher education at lower cost, then many will.

2. Mature age students may be more sensitive to price because they have fewer working years left. However, the available evidence is contradictory.

3. Students who take courses primarily out of interest are more price sensitive than students who undertake higher education for more vocational reasons. This latter group will have a future income stream that will more than cover the cost of their education.

4. Applicants who are not sure whether they want to go to university are probably more sensitive to price than those with clear objectives. People will pay less to keep their options open than they will pay to achieve a specific goal.

5. Students with high risk of non-completion are probably more sensitive to price than those who are confident of success. People try to minimise their losses.

8.2.3 Conclusion

The prospective students with the highest public benefit – those with a reasonable belief that they have careers in skilled occupations ahead of them – are the least likely to be *rationally* influenced by student charges. As table 19 shows, student charges do not have a major influence on their breakeven point.

Student charges will be a small percentage of their lifetime earnings. Private benefits therefore remain high. On the analysis in this section, this group is least influenced by changes in student charges. From the perspective of maximising public benefits, they are the most important group. The changes in aggregate demand were modest (figure 23), and probably mostly from applicants in other groups: those studying primarily out of interest, uncertain of their future plans, or with a high risk of non-completion.

9. Who should pay?

This report considers higher education funding from a first principles basis. In this section, it summarises how a first-principles approach differs from the base funding review and the status quo. But it recognises that higher education funding policy is not starting again. Unsurprisingly, few of those who gain from the status quo will like the conclusions *Graduate Winners* reaches. This report proposes an evolutionary path from current arrangements to a new system that promotes public benefits for the Australian community.

9.1 This report compared to the base funding review

This year the Australian Government will spend $6 billion on the main student driven higher education funding program. In practice around $500 million will be spent on research, leaving $5.5 billion in tuition subsidies. This money will benefit close to 700,000 students. If they study full-time, their annual subsidy will range from less than $2,000 a year for business or law students, to more than $20,000 a year for medical or dental students.

According to the base funding review panel, this public spending is justified by the "public benefit" provided by higher education. Public benefits include both financial and non-financial benefits. This report argues that, conceptually, public benefits provide a sound justification for government spending on higher education. However, it differs sharply from the base funding review panel in how the idea of a public benefit should be turned into policy.

Though the base funding review's reasoning is not always clear, it recommends paying back to students, via tuition subsidies, the expected future value of the public benefits their education will produce (see section 3.1.1 for more detail). On this report's analysis, that is the maximum that government should consider paying. The main purpose of government intervening in higher education should be to increase total public benefits, above what they would otherwise be. The public should come out ahead on its higher education investment, not just breakeven.

In the tuition subsidy framework outlined in section 4, there is no automatic assumption that a tuition subsidy is required or justified. The likelihood of public benefits is a necessary condition of a tuition subsidy. The base funding review took the view that "most public benefits appear to be generated regardless of discipline".[100] The findings in this report show that this assumption is incorrect. The public benefits provided by tax revenues vary by large amounts between disciplines (section 5.1). This report also shows that, at least in the Australian context, that non-financial public benefits differ between disciplines (section 5.3).

Provided public benefits would plausibly exist in a discipline, there is a potential government interest in promoting enrolment. However, because higher education typically offers both public and private benefits, government involvement may be unnecessary (at least if there is a loan scheme; this report assumes that an income-contingent loan scheme like HELP will

[100] Lomax-Smith, *et al.* (2011), p 108

be in place). The private benefits alone may be enough to attract students.

The private financial returns from higher education make higher education attractive for the vast majority of students (section 6.1). Many other studies, including research commissioned by the base funding review, come to the same conclusion. Tuition subsidies promote courses by increasing their net private benefits. They are potential decision-changers for prospective students who believe or fear that their private benefits will be low relative to course costs. For most graduates, however, tuition subsidy levels make little difference to the lifetime financial benefits of higher education (section 8).

Financial benefits alone under-explain the higher education market. Non-financial benefits such as intrinsic interest in the subject matter and enjoyment of the course explain why students choose courses (section 6.2), sometimes despite a high risk of low or negative financial returns. For example, most visual and performing arts students are probably aware of the employment difficulties they will face in their field. But demand for visual and performing courses is strong, because the experience is rewarding in itself (section 6.2).

Section 4.2 uses the hypothetical examples of “David” and “Emma” to illustrate when there might be a public pay-off from a tuition subsidy. “David” expects low private benefits from higher education, and is reluctant to enrol for that reason. But it is likely that if he qualifies for his career he will deliver public benefits exceeding his course costs. A tuition subsidy could change his decision in favour of enrolling, leaving everyone better off. “Emma” is also likely to produce public benefits exceeding the cost of her course. However, her anticipated private benefits are high. She will take the course with or without a tuition subsidy. If one is paid, it will increase her net private benefits, while decreasing potential public benefits by diverting tax revenues from more beneficial uses.

On the available evidence, “Emma” is the more typical case in Australian higher education. If most current graduates had paid more for their education, they would still have been much better off for having been to university. Nobody knows for certain how they would have assessed their prospects aged 17 or 18, relative to a different set of costs. However, the HECS experiment in reducing tuition subsides suggests that most prospective students make the “rational” decision. The benefits still greatly outweigh the costs, and so they proceed to further study (section 8). Consistent with the benefits outweighing the costs, Australia has a large full-fee higher education market (section 2.2). As noted in section 4.2 the base funding review panel share this report’s view that tuition subsidies generally have little effect on student behaviour.

It follows from this that if the public policy goal is to maximise public benefits for the Australian community, then outlays on tuition subsidies are too high. The base funding review panel did not, however, reach this conclusion. They needed other arguments to get to their conclusion that the Commonwealth should cover 60% of the cost of each higher education place. Their in-principle case – it was an implicit argument, with their reasoning not clearly stated – was based on the “fairness” in the public taking the benefits of higher education, but not paying for them. On this report’s argument (section 4.3), fairness does not provide a rationale for a general tuition subsidy system. There is no realistic sense in which the general public is unfairly free-riding

on the public benefits of higher education. In most cases, graduates are already well-rewarded for their education. Society pays for their efforts in above-average salaries and high status. The public benefits associated with higher education are incidental to the private benefits (for example, high taxation) or have at most a modest causal relationship (for example, volunteering). Nobody should expect to be rewarded financially for their every good deed, much less for the good deeds of some general social category to which they belong.

This report shares the base funding review panel's view that socioeconomic differences in higher education attainment do not justify general tuition subsidies (section 4.3.2). These differences mainly reflect prior academic performance rather than family ability to afford higher education. Immediate financial issues are met through the HELP loan scheme and student income support payments.

In some limited cases, the fairness rationale may have a role (section 3.3.1). In practice, teaching and research are bundled in universities. Research is partly financed from student sources. Students may benefit from research – through its integration with teaching (though this benefit is not empirically established in Australia[101]), or through the prestige attached to research universities (though the financial benefits of degrees from research universities are also not firmly established). But the benefits of research are typically general, while the benefits of teaching are specific to the student. The general nature of research benefits makes it a more promising candidate for public funding than teaching.

Some courses lead to social service professions that are, by the standards of graduates generally, modestly paid. Nursing is discussed in section 7.2. It would be easier to make a fairness case for tuition subsidies in these cases than for very well-paid professions such as medicine. However, this report's analysis shows that generally people who enter these professions are not making financial sacrifices to do so. Given the alternatives their school results provide in other lower-pay graduate occupations, vocational education or direct workforce entry, they are maximising their financial returns.

So both public benefit and fairness rationales provide only limited justification for current student-driven higher education subsidies. It is therefore impossible, on these grounds, to support the base funding review panel's recommendation for a public subsidy of 60% of the funding rate for each higher education place. Indeed, the fixed 60% would be hard to support even if this report had found stronger public benefit production or fairness arguments for tuition subsidies. The per student funding rate roughly reflects costs, and has no fixed relationship with public benefits or student behaviour. In high cost disciplines, it might take a high percentage of the total rate to compensate students for their public benefits or to change the preferences of university applicants. In low cost disciplines, a low percentage of the funding rate may achieve the same result.

[101] See Norton (2012), pp14-15 for a brief discussion. Future Grattan research will address this issue in more detail.

9.2 Where to from here?

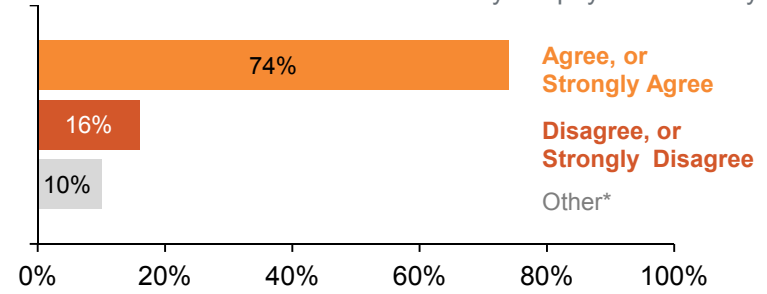
If Australia was to start again with our higher education funding system, it is unlikely that we would spend so much money. With the benefit of hindsight, there are cheaper ways of creating a mass participation higher education system. A tuition subsidy system does not add enrolments much beyond what a loan scheme and student income support could achieve on their own. Tuition subsidies have been reduced since 1989 with little effect on demand and none on total enrolments (section 8). The lifetime economics of higher education are usually good regardless of subsidy levels (section 8.1). The different higher education support mechanisms are as much alternatives as complements.

From a starting point of no subsidies, the Australian public would be unlikely to favour raising taxes or diverting $5.5 billion from other possible spending priorities. There is limited value in making students and graduates better off financially relative to the general population. After all, they typically come from more affluent households (section 4.3.2) and have excellent chances of ending up in more affluent households, regardless of where they started (section 6.1). Consistent with this judgment, there is little support for extending tuition subsidies to the growing number of domestic full-fee students, much less the international full-fee students (section 2.2).

But of course we are not starting again. In higher education, as in other areas, the default policy is the status quo. Whatever a status quo's theoretical shortcomings, in practice it creates protective interests. Universities are persistent advocates for more public funding, and have avoided cuts to nominal per student public spending since 1997.[102] For the largely relatively affluent clientele of the higher education system, higher education tuition subsidies are among their few non-means tested entitlements, one return on the considerable taxes they pay (section 5.1). This helps to create a sense of entitlement. Though among experts the idea that tuition charges are a significant deterrent to higher education participation is largely discredited (section 4.3.2), its intuitive plausibility means that it is widely believed.

For all these reasons, the Australian people like the idea of cheap higher education, as shown in figure 25. A large majority think that university costs are already too high, though other questions in the same survey reveal that (consistent with the facts in section 6) people believe higher education is still worth the money. Public opinion may be different if put in the context of trade-offs with other spending priorities. However, the public's starting point is that ideally they think students should pay less rather than more.

Figure 25 – Public opinion on university tuition fees
"Students have to borrow too much money...to pay for university"



Note: **Other includes "neither agree nor disagree" and "don't know/not sure"*
Source: *ANU Poll, July 2008*

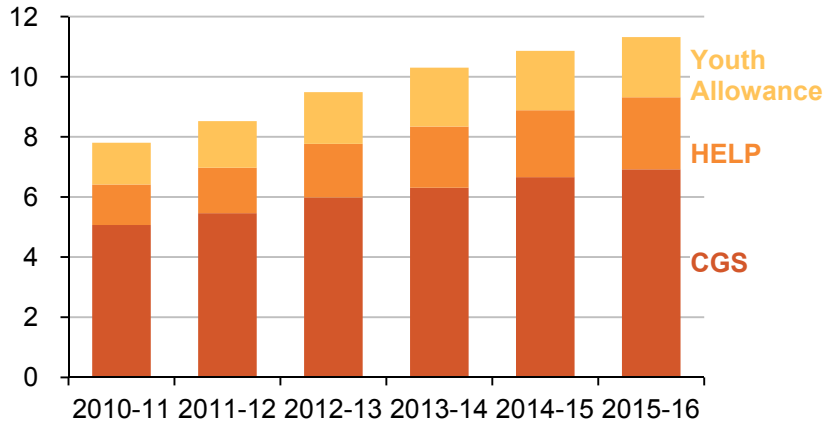
[102] Though there were real cuts due to a below-inflation indexation system.

Given these political constraints, change to the higher education tuition subsidy system is most likely to come from the Commonwealth budgetary process. This is the main institutional mechanism for making trade-offs between competing priorities, in recognition of the reality that the government cannot afford all the things the voters would like to have.

The two main reductions in tuition subsidies since the 1980s reflect decisions that per student higher education subsidies were lower priorities than other public policy goals. In 1989, HECS was intended to help finance an expansion of the higher education system – spreading the expenditure more widely, rather than reducing it in total. In 1997, differential HECS was intended to help reduce the Commonwealth Government's budget deficit. There is nothing unusual about the Australian experience. In many countries higher education spending cuts and fee increases flow from stresses on government budgets.[103] Because student loan schemes make public and private spending good substitutes for each other, public spending can be reduced without adverse impact on higher education activity.

In Australia, the Commonwealth Government has lifted limits on the numbers of undergraduate Commonwealth-supported students. This is leading to substantial increases in spending, with tuition subsidies set to reach nearly $7 billion by 2015-16. Increasing student numbers are also pushing up costs in the HELP loan scheme and the main student income support program, Youth Allowance. Recent and predicted higher education expenditure is shown in figure 26. The minister responsible for higher education, Senator Chris Evans, has told the higher education sector not to expect additional funding as a result of the base funding review.[104] As in 1989, the government puts increasing participation above higher per student tuition subsidies. Whatever the arguments made for tuition subsidies, these policy priorities are unlikely to change. If the overall budgetary situation worsens, as seems likely, per student higher education expenditure will again come under increased scrutiny. The next section looks at how this might be done.

Figure 26 – Higher education spending estimates
$ Billions



Note: CGS = Commonwealth Grant Scheme, which finances Commonwealth contributions. Source: DIISRTE (2012)

[103] Marcucci and Usher (2012)

[104] Evans (2012), p 71

9.2.1 How to save public money in higher education

In the absence of a severe budgetary crisis, this report does not recommend "big bang" reductions in higher education tuition subsidies. Given some uncertainties surrounding behavioural responses to lower tuition subsidies (section 8), an experimental and evolutionary path is required. Changes should be announced and phased in, so that students and higher education providers can make plans knowing likely future funding levels. Phasing-in allows policy to be amended, should student responses to the new prices vary significantly from expectations.

The risk of adverse outcomes differs between disciplines, and therefore tuition subsidy changes should vary between disciplines in their size and speed. The *Graduate Winners* framework for higher education tuition subsidy (section 4.3.3) can be used to guide strategy. The more confident policymakers are that public benefits will be produced with or without a tuition subsidy, the lower the risk in making a change.

In the framework, the first question is what public benefits graduates of a course produce. If public benefits are low, then that field of study is a candidate for relatively large and quick cuts. The risk of lost public benefits is by definition minimal. In disciplines that do produce significant public benefits, the additional issues in the framework need to be analysed.

The larger the private benefits, the lower the chance that there will be any major drop in demand. With high private benefits, a course will look good compared to any likely alternative. In the context of patterns of higher education demand, how the course in question compares to other courses drawing on applicants with similar interests is particularly important (section 6.2). Applications data needs to be routinely monitored so that policymakers have recent and reliable data on higher education sub-markets. For example, demand for engineering is important due to skills shortages, so which courses are its competitors? In section 7.1, this report notes our concern that science may have been drawing demand away from engineering. Policymakers also need to know more about how vocational education and the labour market compete with higher education. Especially in the lower ATAR groups, significant numbers of school leavers do not apply for higher education or reject their offers.

Workforce skills shortages and skill forecasting data can be used in combination with higher education demand data to see which courses need to maintain or increase their supply (as for example this report does in section 6). Where demand for higher education places is strong relative to the likely need for graduates, there is less public benefit risk in a demand downturn. For example, the Government is decreasing the science Commonwealth contribution for 2013 by around $3,500, and increasing the student contribution by the same amount.[105] There are no general shortages of science graduates, and so this cut is unlikely to result in shortages of science graduates. This change restores the pre-2009 relativities between student and Commonwealth contributions, further increasing confidence that it will not have undesirable consequences.

By contrast, there are current skills shortages in engineering and nursing (sections 7.1 and 7.2). Skills shortages increase the chance of high private returns (particularly in engineering), and so also reduce the chance of lower student demand. However, skills

[105] Subject to the legislation being approved by Parliament.

shortages also increase the risk of adverse outcomes should student demand fall away. This could create significant problems in the industries affected. For engineers, labour shortages create business bottlenecks that can flow through to other labour markets. Where there are high risks of fewer graduates in skills shortage occupations, tuition subsidies should be reduced more slowly, in case a price shock leads to an over-reaction among potential applicants.

Existing statistics on university applications and offers give us some guide as to the risks. Engineering has a high offer rate (84 per cent of applicants in 2011[106]), showing that universities are taking most applicants. A fall in demand could lead to empty places at universities. By contrast, only 21 per cent of applicants for medical school receive an offer. Though there are shortages of doctors as well as engineers, demand for medical places is so high that fewer applicants would not affect the supply of doctors.

Because the higher education tuition subsidy system is based on history and politics (section 2), the Commonwealth Government is not currently organised to design a tuition subsidy system that would maximise public benefit. However, most of the relevant application, enrolment and labour market data are already collected. The higher education bureaucracy could be reorganised to analyse this data and provide empirically-based advice to government.

Finally, fairness issues need to be considered. As this report argues in section 7, in practice most relatively lowly-paid graduates do not have many realistic high-paying options. However, there are occupations for which a normative case can be made that they are under-paid relative to their social value. Empirical tests can inform but not settle a fairness question. Unlike other aspects of the higher education funding system normative questions are inherently political. Politicians will need to make judgments about how much these employees should earn.

9.2.2 Indicative figures on potential savings

Graduate Winners has not constructed the detailed by-discipline predictive model needed to balance the risks and benefits of changing what students pay. However, it is possible to provide a general guide to potential savings. Figure 27 (over the page) shows how budget forecasts would change if most disciplines had phased spending cuts to 80% of the previous level in year 1 (2013-14 in the figure), to 70% in year 2, 60% in year 3 and 50% in year 4. Given known labour market shortages for nursing and engineering, slower phase-downs were used, to 80% and 75% of former funding levels respectively. Phase-downs to social work and agriculture were also kept to 80% of former funding levels, given the typically poor financial returns for graduates in those disciplines and uncertain demand.[107] No discipline is taken below $1,000 per student, the approximate amount of funding used for research (section 3.2). Only business and law reach this minimum by year 4, reflecting their already low tuition subsidy levels.

If these phase-downs were used, tuition subsidy spending that is otherwise likely to exceed $7 billion by 2016-17 would instead be around $4.3 billion. Actual savings would depend on the rate of tuition subsidy reductions, and on the patterns of student

[106] DEEWR (2011c), p 33

[107] Demand for these courses is not clearly distinguished in the published applications data.

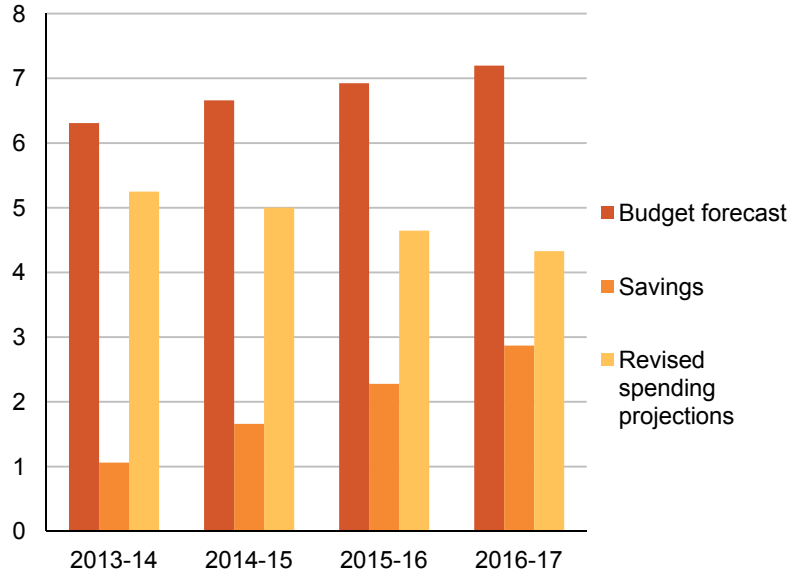
enrolments over coming years. Potential savings from decreased tuition subsidies would be lower if there is a shift to courses with large tuition subsidies, and higher if there is a shift to courses with low tuition subsidies. Given how the HECS-HELP loan scheme is currently organised, its costs would go up through increased interest costs and doubtful debt. Future Grattan research will examine the cost of HECS-HELP.

Government savings on tuition costs would not be cuts to total university income. Universities would be free to increase their student contributions by an equivalent amount (whether or not universities should be able to increase student charges above current total funding rates is an on-going political issue, but not one addressed in this report). For some low tuition subsidy disciplines, this would not necessarily lead to substantial increases in student contributions. For example, student contributions for business courses would increase by less than $1,000 a year. However, student contributions in medical courses could go up by $10,000 a year with a 50% reduction in tuition subsidies. How much student contributions would actually increase would be a matter for universities. In the competitive market created by the demand-driven funding system, some may not increase student contributions to their legal maximum.

9.3 The benefits of change

Policy reform is politically difficult because the losers are more obvious and vocal than the winners.[108] The opaque budget process means that the government funding winners are unlikely to ever know how their money was found. Budget history since the late 1990s shows that the health and social security portfolios are the big winners, the beneficiaries of $17 billion in savings from replacing public funding with student contributions.[109]

Figure 27 – Potential savings from lower tuition subsidies
$ billions



Note: 2016-17 Budget forecast presumes spending grows at the same rate as the previous year. Estimates based on 2012 funding rates and 2011 university funding agreements, adapted with 2010 enrolment data to estimate discipline shares of broad funding clusters
Sources: DIISRTE (2012), Grattan estimates

[108] Daley (2012)

[109] ABS (2012b)

But could there also be benefits for higher education?

One likely benefit would be greater competitive neutrality between public universities and non-university higher education providers (NUHEPs). Under the current system, public universities but not NUHEPs have a largely unrestricted entitlement to undergraduate CSPs. This gives universities a price advantage over the NUHEPs, which usually charge higher fees than university student contributions, reflecting their lack of tuition subsidies.[110] If tuition subsidies were wound back for public universities, NUHEPs would be more price competitive. The apparent rapid growth in the NUHEP sector after they gained access to income-contingent loans in 2005 suggests that more favourable financing schemes result in increased demand.[111]

The NUHEP sector is diverse and under-researched, so caution is necessary in arguing that there are benefits in encouraging its expansion. However, NUHEPs offer a number of potential advantages over public universities. Most are focused on teaching rather than research, removing a rival time use for teaching staff. In Australia the limited published studies find a negative relationship between research performance and student satisfaction.[112] Given competing hypotheses about the relationship between teaching and research, and conflicting international evidence, Grattan is doing further work on this issue. However, if a low or research environment is a net positive for teaching, this is likely to particularly benefit students who start their higher education with weaker prior school achievement. Indeed, "pathways" colleges for under-prepared students are an existing area of NUHEP activity.

Anecdotally, HECS led to students working harder and asking more of academic staff. Other things being equal, such behaviour changes are likely to be good for academic outcomes.[113] Unfortunately, there is no time series evidence that can say whether the anecdotes reflect reality. We know that full-fee international students work harder than domestic students, and that American students (who generally pay more than Australians for their education) work harder than Australian students.[114] It is plausible that higher charges deter students who are not serious about study, and encourage those who enrol to avoid wasting their investment through lack of effort. However, cultural differences in attitudes towards education may also explain these differences.

A gradual and evolutionary reduction in tuition subsidies would also protect universities from future government policy shocks. Recent higher education policy has parallels with Victorian experience in vocational education. In Victoria, a demand-driven system led to much greater uptake than anticipated. Cutbacks

[110] Different hypotheses about higher education price sensitivity are sometimes confused. The argument in section 4.3.2 is not that low SES people are insensitive to price, it is that they are not more sensitive than high SES people. The argument in section 8 is that given the large private benefits from higher education, few prospective students will change their yes/no decision to attend. However, if the same broad objectives could be achieved at lower cost, prices are more likely to influence behavior. This is what is observed in the international and postgraduate markets, with widely-varying fees for courses with the same or very similar names.

[111] For some information on growth in NUHEPs, see Norton (2012), pp 13-14

[112] Ramsden and Moses (1992);Barrett and Milbourne (2011)

[113] Arum and Roksa (2011)

[114] Edwards (2008); ACER (2011)

announced in the 2012 Victorian budget to bring total vocational education spending under control appear to be causing significant disruption in both TAFEs and private vocational education providers.[115]

9.4 Conclusion

This report's findings and policy recommendations are counter-intuitive. Historically, tuition subsidies were introduced for sound reasons, with grants and scholarships opening higher education to able students who would otherwise have missed out on further study. Most students who have ever attended an Australian higher education institution received at least some government assistance. Even before the "free education" era only a minority of students paid fees. Public funding of higher education seems "normal" to most Australians.

Over time, however, experience has cast doubt on old higher education assumptions. A large full-fee market has challenged the idea that tuition subsidies are essential. Income-contingent loans have shown themselves capable of dealing with access obstacles. People from low socioeconomic status backgrounds have shown themselves willing to pursue higher education, if they do well enough in year 12. Australia is left with a hybrid system, one which mixes the institutions of different policy eras.

This report uses the experience of recent decades to take us back to first principles. How should we design a higher education funding system, given what we now know? The *Graduate Winners* public funding framework proposes a way of ensuring that the public receives benefits from its higher education investment, without unnecessary redistribution of income and wealth to students and graduates, and without higher education putting unnecessary burdens on government budgets.

[115] Hall (2012)

10. Glossary

ABS	Australian Bureau of Statistics
ACPET	Australian Council for Private Education and Training
ATAR	Australian Tertiary Admission Rank
ATO	Australian Taxation Office
AuSSA	Australian Survey of Social Attitudes
CGS	Commonwealth Grant Scheme
Commonwealth contribution	The federal government's tuition subsidy
Coursework place	A student place primarily made up of subjects with curriculum set by the university; as distinguished from a research place.
CPI	Consumer Price Index
CSP	Commonwealth-supported place. A higher education place with a Commonwealth contribution and a student contribution.
Decile	Each of ten equal groups into which a population can be divided. For example, the top decile represents the best 10 individuals in a group of 100.
DEEWR	Australian Department of Education, Employment and Workplace Relations
DEST	Australian Department of Education, Science and Training
DIISR	Australian Department of Innovation, Industry, Science and Research
DIISRTE	Australian Department of Industry, Innovation, Science, Research and Tertiary Education
EFTSL	Equivalent full-time student load. For example, two students taking half a full-time student's units of study equals one EFTSL.
FEE-HELP	HELP for full-fee students
FTE	Full-time equivalent. For example, two half time staff equal one FTE.
Full-fee place	A student place in which the student pays the full student charge
Funding rate	The total of the Commonwealth contribution and the student contribution
GCA	Graduate Careers Australia
GSS	General Social Survey

HECS	Higher Education Contribution Scheme. It is used to describe both the student charge and the loan scheme. This terminology was replaced in 2005.
HECS-HELP	HELP for Commonwealth-supported students
HELP	Higher Education Loan Program. It lends money to students with repayments dependent on income.
HEP	Higher education provider. An institution authorised to award a higher education qualification.
Private benefit	Benefits from higher education received by the student, graduate, or someone paying for their services
Public benefit	Benefits from higher education received by someone other than the graduate that are not directly paid for
Public contribution	Payment by a government as a contribution to tuition costs
SES	Socio-economic status
Student charge	Money paid by a student for their higher education
Student contribution	The amount paid by a student in a Commonwealth-supported place
Student fee	The amount paid by a student in a full-fee place
HILDA	Household, Income and Labour Dynamics in Australia survey
IRR	Internal rate of return; a measure of investment profitability
NPV	Net present value; a measure of investment profitability
NUHEP	Non-university higher education provider
Percentile	Each of 100 equal groups into which a population can be divided. For example, the 90th percentile represents the 90th best score in a population of 100 individuals.
Student place	A term used to describe coursework equivalent to a full-time student load. For example, two half-time students would equal hold the equivalent of one student place.
TAFE	Technical and further education
TEQSA	Tertiary Education Quality and Standards Agency
Tuition subsidy	A government payment to support the costs of higher education tuition.
University	A higher education provider meeting specific criteria, including conducting research and offer a range of courses.

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