

COVID-19 pandemic research funding shortfalls and workforce reductions modelled for individual Australian universities

Frank Larkins and Ian Marshman,

**Honorary Fellows, Melbourne Centre for the Study of Higher Education,
The University of Melbourne**

The views and comments expressed in this paper belong to the authors and do not necessarily reflect those of the LH Martin Institute, Melbourne Centre for the Study of Higher Education and The University of Melbourne.

Summary: The revenue margins available to Australian universities to cross-subsidise research activities from overseas student fee revenues have been modelled using 2018 data sets and the average domestic cost of teaching for Go8 universities as the reference point.

It is predicted that as a result of a decline in international student fee revenue Australian universities collectively will have a shortfall in discretionary income available to support research over the next five years to 2024 of between \$6.4 billion to \$7.6 billion. The shortfall will result in a reduction in the research force of between 5,100 to 6,100 research student and staff researcher positions, approximating some 11% of the current research workforce.

The precarious situation currently faced by the sector, because of the loss of overseas student revenues due to the COVID-19 pandemic, is underscored by the fact that for 2018 university dependency on discretionary fee revenue to support research was equal to 51% of all externally sourced research income and government research block grant funding. Some universities were committing more of their own discretionary funds to research than externally sourced research income. The impact of the pandemic means that the discretionary funds available system-wide will be reduced from the current 51% to less than 30% of external funding for 2020 and beyond.

While all Australian universities will be impacted, thirteen universities are identified as the most vulnerable regarding their future capacity to support research at current levels. This is due to the size of their research effort and international student programs. These 13 universities include the Go8 universities, which account for 70% of the research funding and staffing shortfalls, and five other universities which account for 18% of the shortfalls. The remaining 25 universities share just 12% of the impact of the shortfall.

*The scale of the research challenge, when universities are committing more discretionary fee income to fund research than externally sourced research funds and are now facing significant fee loss, means that the risk of losing research momentum will be **extremely high**. The University of Technology Sydney, Deakin and Macquarie universities are in this risk category, especially **if effective mitigation actions are not achieved**. For Sydney, Melbourne, New South Wales, QUT, Griffith and Queensland the risk is less, but still will be **very high**, while for Monash, Adelaide, ANU and UWA risks will be **moderately high**. The other 25 universities will face research challenges, but generally at a lower level of risk.*

The research investments made by these thirteen universities have resulted in each improving their international rankings in recent years. Consequently, university international research

reputations are significantly at risk because of the research revenue shortfalls. Reputational damage will be to the national detriment.

To protect research programs and standing universities will need to identify savings in other expenditure areas and find additional revenue sources. Enhanced university-industry collaborations opportunities, while important, will be limited because of the low level of business research and experimental development.

Governments, federal and state, can also play a role in strengthening the national research framework to ensure Australia maintains an internationally competitive higher education research sector to underpin national economic prosperity and community wellbeing. Possible research-related policy actions by all sectors for a post COVID-19 world are discussed.

1. Introduction

The impact of the COVID-19 pandemic on the financial management of Australian Universities has been much discussed by commentators in recent months. All universities have been affected with the most vulnerable being those with proportionally higher enrolments of overseas students and modest cash and investment reserves. In an earlier article (1) the resilience of individual universities to manage all their revenue losses was modelled. It was predicted that universities will face serious challenges for at least the next three to five years with total fee losses up to around \$18 billion if mitigation strategies, including identifying new revenue streams and more government assistance, are not effective. Universities were grouped into three risk categories – high, medium or low – in accordance with their assessed financial management risk challenges using two main criteria – the predicted level of annual decrease in overseas student fee revenue and the capacity of universities to access their cash and investment income or the equivalent by using these funds as collateral.

In another paper (2) the strong research performance of Australian Universities over the past decade was found to depend increasingly on the use of internal discretionary funding. For 2018 some 50% of all university research expenditure was sourced from discretionary funds. It was assessed that 57% of those funds could reasonably have been obtained from overseas student fee income. Consequently, based on the modelling reported in reference 1, using the pessimistic fee losses to 2024, it was estimated that the shortfall in funds available from student fees over the next five years would be around \$7.2 billion dollars (3). Assuming (conservatively) that 50% of those funds, when available, would have been allocated to staff salaries and research student stipends at an average cost of \$150,000 per FTE researcher (equivalent to a senior lecturer salary at \$125,000 with 20% on-costs for each researcher), it was predicted that the reduction in the R&D workforce would be more than 4,600 full time researchers. With this approach it was not possible to determine the potential impact on individual universities because insufficient data on total research expenditure by university was available publicly.

In this article a different modelling approach has been adopted to estimate the potential research funding shortfall and full-time researcher losses for individual universities. This study complements the earlier research (1) with a focus on the research-related financial stresses likely to be experienced, especially by the leading research-intensive universities and emerging aspirant research-led universities. There is broad consistency between the outcomes of the present and previous approaches at the sector-wide level.

2. Modelling Methodology

The approach adopted in this paper requires the difference between the average cost of teaching domestic bachelor and postgraduate students and the average amount received by a university for each full fee overseas students (FFOS) to be determined. The revenue fee margin, because of the higher pricing of courses for overseas students, is viewed as discretionary revenue available to cross-subsidise research activities. Universities do have other discretionary income that is used to support research and other activities. This component is not modelled in any detail here.

There is no definitive sector-wide data available on the average cost of teaching domestic students that is universally accepted by the universities. The most recent information available and the most comprehensive is from the 2019 Deloitte Access Economics study (4) commissioned by the now Department of Education, Skills and Employment. Deloitte estimated that the average domestic course costs across all levels of the Australian higher education sector for all universities was \$18,400. This study was the latest in a series of Deloitte evaluations commissioned by the Department. Both the Department and the Government have relied on these estimates to determine the appropriate funding level for Commonwealth Support Places (CSP) by discipline cluster. The data were background to the recent Job-Ready Graduate Higher Education Reform Package discussion paper (5). Several deficiencies in the Deloitte cost of teaching methodology have been documented by Massaro (6). Despite its noted deficiencies, the Deloitte report is the basis upon which the government has developed its policy and so it is used for the analysis in this paper. To our knowledge there has been no other comprehensive studies in recent years

In what follows it will be shown that the Go8 universities are very prominent in cross-subsidising research from FFOS revenue. Go8 average teaching costs could be expected to be higher than the higher education sector average because they do offer more of the expensive laboratory-based courses in the medical sciences, veterinary science and engineering. However, this is counterbalanced somewhat because they also offer many lower cost courses in the humanities, law, business and economics. Deloitte reported that seven of the eight research-intensive Go8 universities responded to the survey and that there were relatively small differences in the teaching costs between Go8 and non-Go8 universities. In fact, Go8 bachelor teaching costs were 2.8% higher than the average and postgraduate teaching costs were 0.8% higher than the average. Therefore, for this study, which focusses on the impact of FFOS revenue shortfall on research funding the average teaching costs for all universities have been increased by 2.8% to \$18,900 (\$500 per EFTSL above the Deloitte estimate). This value will be an overestimate of teaching costs for some universities, so the quantitative estimates of revenue shortfalls for these universities are conservative. Nevertheless, the Go8 benchmark is a prudent approach given that the research-intensive universities with more of the expensive courses will be the most affected by the loss of FFOS revenue.

Using the Department of Education, Skills and Employment 2018 data for the overseas student load (EFTSL) and the full fee revenue (FFOS \$) for each university (7,8) the average full fee overseas student (FFOS \$) dollars per EFTSL can be determined. This information is given in columns 2, 3 and 4 respectively of appendix 1. The universities are placed in the same four groups, A to D, as in the previous study (1), in accordance with the size of their FFOS revenue. The 2018 revenue for group A universities was above \$500 million, for group B between \$500

million and \$200 million, group C between \$200 million and \$100 million and for group D below \$100 million. The income margin between the average cost of teaching chosen, i.e. \$18,900, and the amount received per EFTSL by each university (column 4) is shown in column 5. By multiplying this margin by the total overseas EFTSL in column 2 the revenue above the \$18,900 cost estimate is determined for each university as shown in column 6. It is reasonable to assume that universities have discretion over these additional funds to use for strategic educational purposes, including the cross-subsidisation of research and research training programs. In this study it is assumed that universities do use this additional income to cross-subsidise their research activities. There is clear evidence to support the validity of this assumption as acknowledged by Universities Australia and the Go8 universities (10,18).

3. Analysis of the data

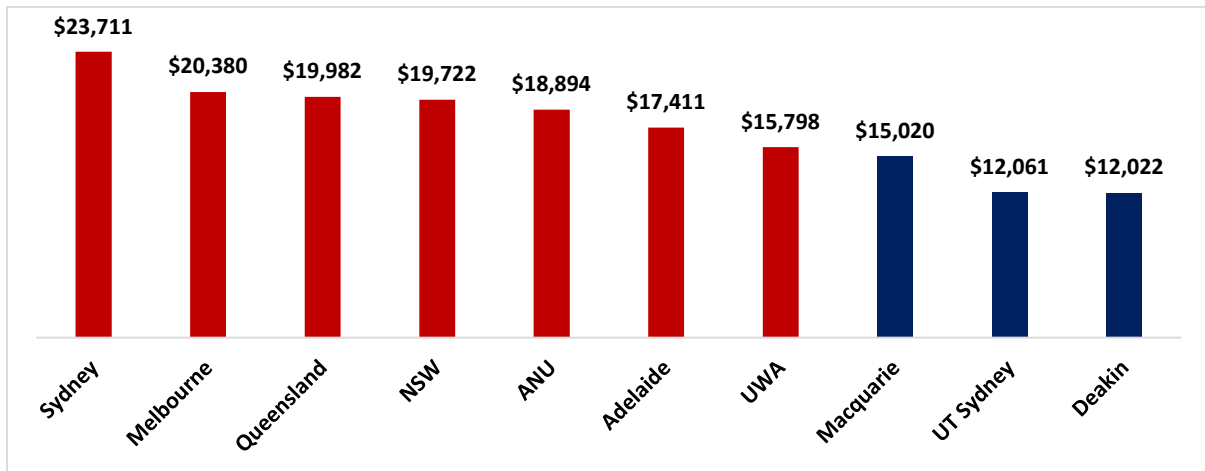
3.1 Fee Revenue Per Full Fee Overseas Student

The data analysis reported in column 4 of appendix 1 shows that there is a wide variation in the average fee received per overseas student (FFOS \$/EFTSL) by universities in 2018. Sydney reported the highest average pricing at \$42,611 closely followed by Melbourne at \$39,280. All the Go8 universities, except Monash, have average fee pricing well above \$30,000 per FFOS. At the other end of the scale are group D universities. Among these, Murdoch reported receipts of just \$9,821, Victoria \$10,815 and James Cook \$14,662. The average for all universities was \$28,171, some \$9,271 above the \$18,900 estimate for a domestic student used in this study. The student load in column 2 and the fee income in column 3 do not differentiate between onshore and offshore students or other cost-sharing arrangements with third parties as separate financial data are not publicly available. The onshore and offshore student distribution for universities is available and was analysed in an earlier publication (9). Monash, RMIT, Wollongong, Curtin, Swinburne, Victoria, James Cook and Murdoch were all identified as having significant offshore enrolments (reference 9, appendix A). The lower cost structures reflect why these universities are the ones with the lowest fee revenue per FFOS identified in this study. This feature accounts for why Monash at \$26,606 is below the average of \$39,849 for the other four group A universities. Similarly, RMIT at \$19,662 is below the average of \$33,452 for the other group B universities.

3.2 Fee Margin Relative to the Cost of Teaching above the Go8 Average of \$18,900

The fee price margin for each university relative to \$18,900 is shown in column 5 of appendix 1. Interestingly, this analysis reveals that Wollongong, Curtin, Victoria, James Cook and Murdoch universities all have lower income receipts on average for each overseas student than the chosen Go8 benchmark figure of \$18,900. There are several reasons for the lower figure, including the real costs of the courses offered, the mix between sub-bachelor, bachelor and postgraduate, the number of offshore students enrolled and partnership arrangements with third parties. The present analysis does not imply that these universities, and others, do not invest any discretionary funds in research. Their cost of teaching structures will generally be lower than the Go8 universities as highlighted in the Deloitte report; however, their investment capacity will be more limited and more reliant on other revenue sources. The use of the overseas fee price margin above the Go8 benchmark is the primary focus of this study. The ten universities with the largest fee margins are shown in figure 1.

Figure 1 Overseas Fee Margin Per Student above the Go8 Average of \$18,900 for the Ten Highest Ranked Universities: 2018 Data.

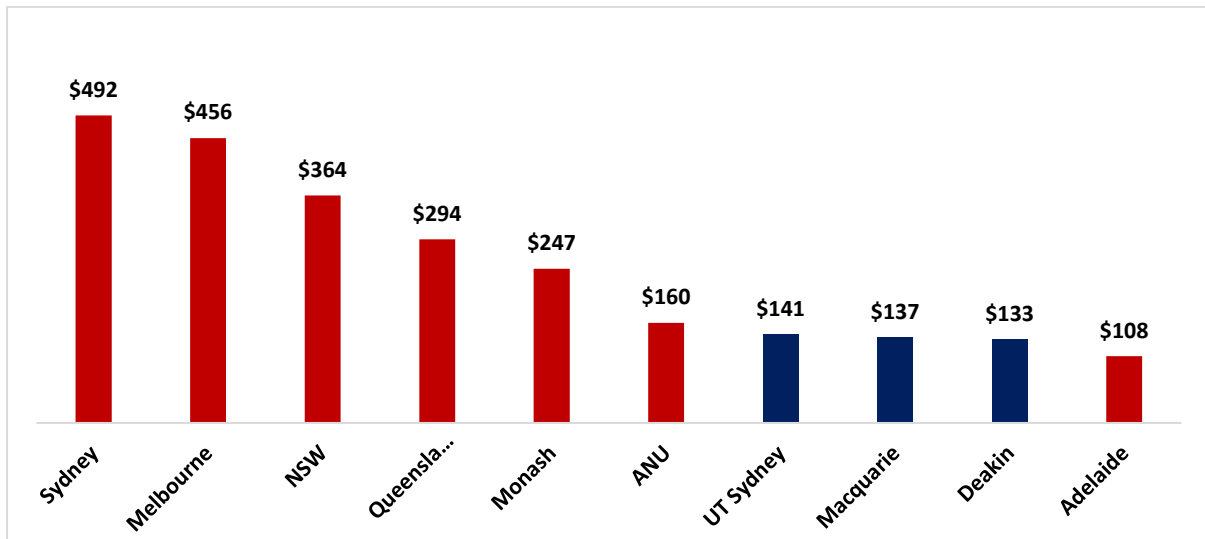


The first seven universities (shown in red) are G08 universities with fee margins in the range \$23,711 for Sydney to \$15,798 for UWA. Macquarie is the next ranked university at \$15,020 then there is a significant gap to UTS and Deakin at near \$12,000. QUT is just outside this group with a fee margin of \$11,900 then there is a significant gap to the other group C and D universities. Some 27 of the 38 universities have a fee margin per student of less than \$10,000. The lower revenue margin significantly limits the capacity of universities to cross-subsidise research and any other educational priority activities. The one Go8 university not in the above group is Monash at \$7,706, principally because of its on-shore and off-shore student mix. RMIT with a fee margin of only \$762 reflects its offshore and sub-bachelor student involvements.

3.3 Total Overseas Student Revenue Above the Go8 Average

The total amount of 2018 student revenue for each university above the Go8 benchmark has been determined by combining the EFTSL count in column 2 of appendix 1 with the fee margin in column 5. The results are listed in column 6. In total, the margin which reasonably represents the total discretionary income available is \$3.1 billion (last row of appendix 1, column 6). The amount by university ranges from more than \$492 million per annum for Sydney to less than one million for Notre Dame, with five universities having no excess revenue as discussed above. The ten highest ranked universities by total revenue margin are shown in figure 2.

Figure 2. Total Overseas Student Revenue Margin Per Annum above the Go8 Average of \$18,900 for the Ten Highest Ranked Universities: 2018 Data, \$ Millions



These ten universities each have additional revenues of more than \$100 million p.a. because of their overseas fee pricing structure and student mix. The first six are Go8 universities with the group B universities UTS, Macquarie and Deakin ranked from seven to nine. They have all improved their research performance significantly in recent years, as discussed in section 3.8, partly driven by the increased discretionary income available. Adelaide is the tenth university with additional revenue at \$108 million. There is a significant gap to the next university, QUT, at \$84 million. UWA is the only Go8 university not in the top ten at \$70 million. Monash has displaced UWA because of its large overseas student EFTSL count at 32,022 compared with UWA at 4,403. It is these funds that mainly provide the capacity for universities to cross-subsidise research activities. Three universities, QUT, Griffith and UWA, have a revenue margin between \$50 million and \$100 million, while 25 universities have a revenue margin of less than \$40 million from this source.

3.4 Fee Revenue Margin Available to Support Research Activities

The fee revenue margin per annum for all universities shown in column 6 of appendix 1 and in column 2 of appendix 2 amounts to \$3.1 billion (last row of appendix 1, column 6). In an earlier study (2) it was estimated that \$6.2 billion of discretionary funding was required to cross-subsidise research. Overseas student fees represented \$8.8 billion (57%) of the \$15.4 billion of non-government funding available. If non-government funding was committed proportionally to fund research, then \$3.5 billion of the \$6.2 billion required would be sourced from FFOS revenue. The present figure of \$3.1 billion implies that the cross-subsidisation of research activities from FFOS revenue was at 50% of the discretionary funds committed rather than the proportional earnings figure of 57%. The current estimate is the lower limit of the expected losses that support research activities from FFOS revenue because not all universities have a cost of teaching average value as high as for the Go8 universities. To achieve a FFOS revenue margin of \$3.5 billion with the present model would require the average cost of domestic teaching to be reduced to \$17,500 per EFTSL. This figure is still above the Deloitte average figure for bachelor teaching of \$17,300. Using this figure would provide an upper limit to the available discretionary funds available. The more conservative approach using Go8 data has

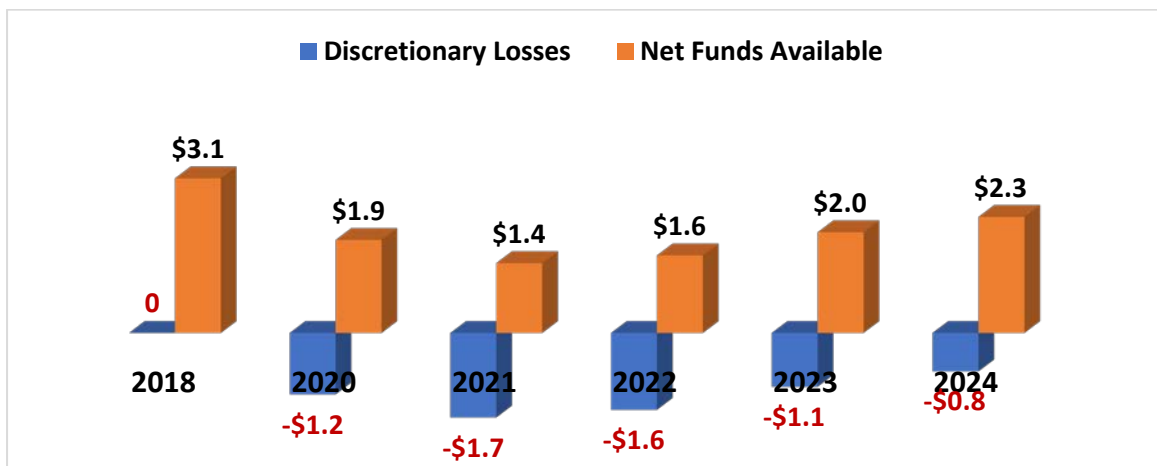
been considered appropriate for the present study as research-intensive Go8 universities are among those most impacted.

In the earlier paper (1), using a pessimistic scenario the impact of the pandemic until 2024 was predicted to result in total overseas revenue losses for all 38 Australian universities of \$18.1 billion. It was assumed that there would be a 40% loss in overseas student revenue in 2020 compared with 2018, a 55% loss in 2021, a 55% loss in 2022, a 35% loss in 2023 and a 25% loss in 2024. University commentaries over recent months support the conclusion that these estimates are both realistic and very probable. Universities Australia (10) has recently estimated that university losses because of the pandemic from all revenue sources would be in the range \$16 billion and \$18 billion – close to our previous pessimistic scenario estimate of \$18.1 billion.

By applying the fee loss model to the \$3.1 billion revenue margin stream (appendix 1, column 6) the reduction in available funds each year from 2020 to 2024 may be determined. These annual university shortfalls are shown in appendix 2 columns 3 to 7. The total shortfall for each university over the five years is shown in appendix 2, column 8.

The net collective effect for all universities is an estimated loss of support for research from FFOS fees of \$1.25 billion in 2020 and \$6.4 billion over the five years. (second last row of appendix 2). Universities therefore collectively, would still have available an additional \$9.2 billion of overseas student revenue to support research over the next five years (\$15.6b-\$6.4b) instead of \$15.6 billion if there had been no loss of fee income (last row at appendix 2). This outcome is shown graphically in figure 3. The year 2021 is predicted to be the most challenging year before progressive recovery to 2025. These numbers are conservative since they are based upon 2018 revenue values with no corrections for annual fee increases and the revenue margins for some universities will be greater than those predicted using the Go8 cost of teaching figure.

Figure 3. Predicted Sector-Wide Overseas Student Fee Revenue Losses and the Residual Net Funds to Support Research from 2020 to 2024. \$ billions

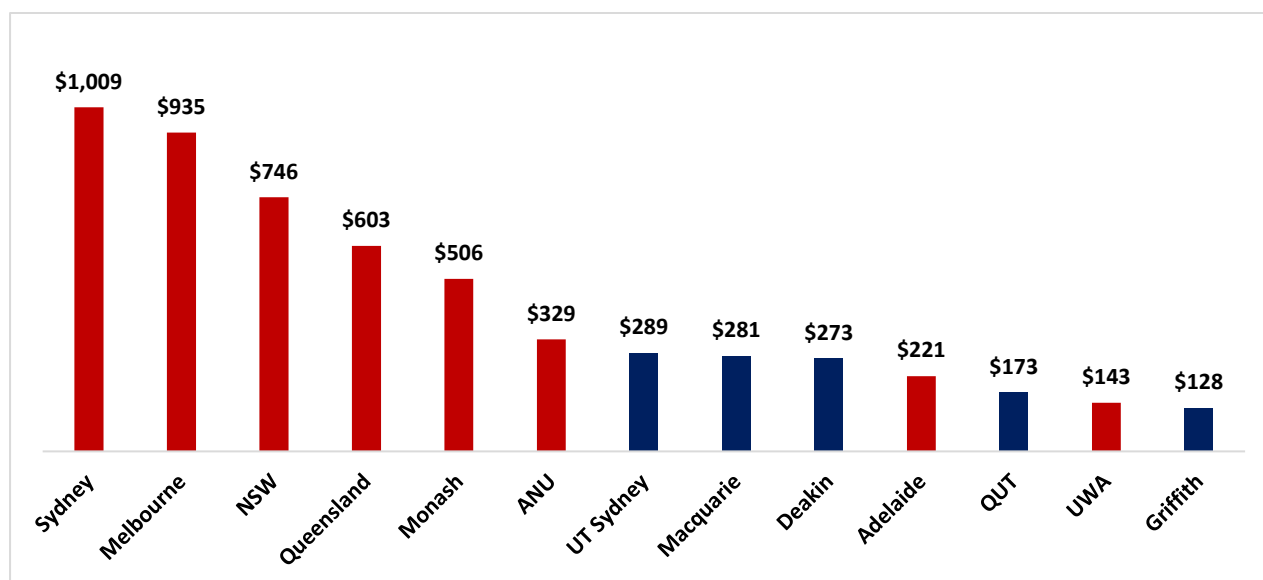


Some \$3.8 billion (60%) of the losses are associated with the five group A universities (designated as the U5 Group in previous studies (11,12)) and \$1.6 billion (25%) with the seven group B universities. Hence, only 15% of total fee shortfall is associated with the 26 group C

and D universities. This is as expected since group C and D universities the ones with the lower overseas student revenues.

The thirteen Universities shown in figure 4 each potentially need to manage their research activities with five-year FFOS losses of more the \$120 million (column 8). They range from Sydney with a shortfall of \$1,009 million to Griffith at \$128 million. All Go8 universities are among these universities. UTS, Macquarie, Deakin, QUT and Griffith have been among the most improved universities in terms of research performance in recent years. They will be especially research challenged by the pandemic developments as highlighted in section 3.7. Nine Universities have potential losses between \$40 million and \$80. Another sixteen universities have potential losses of less than \$40 million. The present analysis demonstrated that it is the group A and B universities along with the group C universities, Griffith and UWA, that will be most challenged to maintain the momentum of their research and research training activities.

Figure 4. Thirteen Universities with Predicted Discretionary Income Fess Losses from 2020 to 2024 of More than \$120 million: Based on 2018 Data \$ Millions



These thirteen universities account for \$5.6 billion (88%) of the \$6.4 billion of the sector-wide losses. The Go8 universities account for \$4.5 billion (70%) of the losses and the other five universities for \$1.1 billion (18%). This means that the other 25 universities account for only 12% of the losses. The Go8 share of losses at 70% aligns with the fact that these universities account for more than 65% of Australia’s research activities. This alignment does provide some further validation for the present approach.

3.5 Other Areas of Revenue Losses Impacting on Research Activities

Universities Australia (10) has estimated the total university losses for 2020 to be in the range \$3.1 billion to \$4.8 billion and \$16 billion to \$18 billion to 2023. In an earlier paper (2) it was reported that for 2020 the total annual operating expenditure for universities was \$32.5 billion and the R&D expenditure \$12.2 billion i.e. (37%). If losses associated with research activities are pro-rated in the same proportion then \$1.2 billion to \$1.8 billion of the 2020 losses can be linked to research and \$6.0 billion to \$6.7 billion over the longer term. These numbers align

quite well with the estimated in the present study of \$1.25 billion in 2020 and \$6.4 billion to 2024 (appendix 2, second last row).

It is reasonable to assume that there will be some reduction in the \$3.1 billion of other non-fee-related discretionary funding used to support research. Revenue is derived from sources including donations, investments, infrastructure capital gains and royalty payments. Some of these revenue streams will also be adversely affected by the COVID-19 pandemic. Conservatively, if there was a modest eight percent decrease in these funds support for research would decrease by a further \$250 million p.a., or \$1,250 million over the five years. Hence the decrease in funds to support research from both sources would be around \$1.45 billion in 2020 and \$7.6 billion to 2024.

3.6 Impact of Revenue Shortfalls on Research Workforce Numbers

In the previous study (3) it was assumed that 50% of the research discretionary funds were used for researcher salaries and research student stipends at an average cost of \$150,000 per researcher. The Deloitte study (4) reported that 60% of the cost of teaching should be attributed to staff salaries. In a recent Higher Education Research and Development expenditure study (HERD) (13) the Australian Bureau of Statistics (ABS) reported that the Australian university research workforce in full time equivalent terms was 30% academic staff, 15% research assistants and 56% postgraduate students. It is reasonable to conclude that 60% of the discretionary revenue is available to support research student stipends, research assistant, postdoctoral fellows and other research-only staff. The \$150,000 has again been used as the average salary and on-costs expended for each researcher. The value is considered as an upper limit. Student stipends and research assistant salaries will be lower than this amount, while some academic researcher will be receiving a higher salary package,

Overall, using 60% of the average discretionary loss figure of \$1.28 billion p.a. i.e. \$767 million (appendix 2, column 8, second last row, 20% of \$6.389b over five years=\$1.28b) and \$150,000 as the average researcher cost, the job losses associated solely with the FFOS fee margin reduction will be near 5,100 FTE. Some 3,000 FTE of these job losses are predicted to be linked to the group A universities and 1,300 FTE to the group B universities. The Go8 universities would account for 3,600 of the 5,100 reduction in the research workforce.

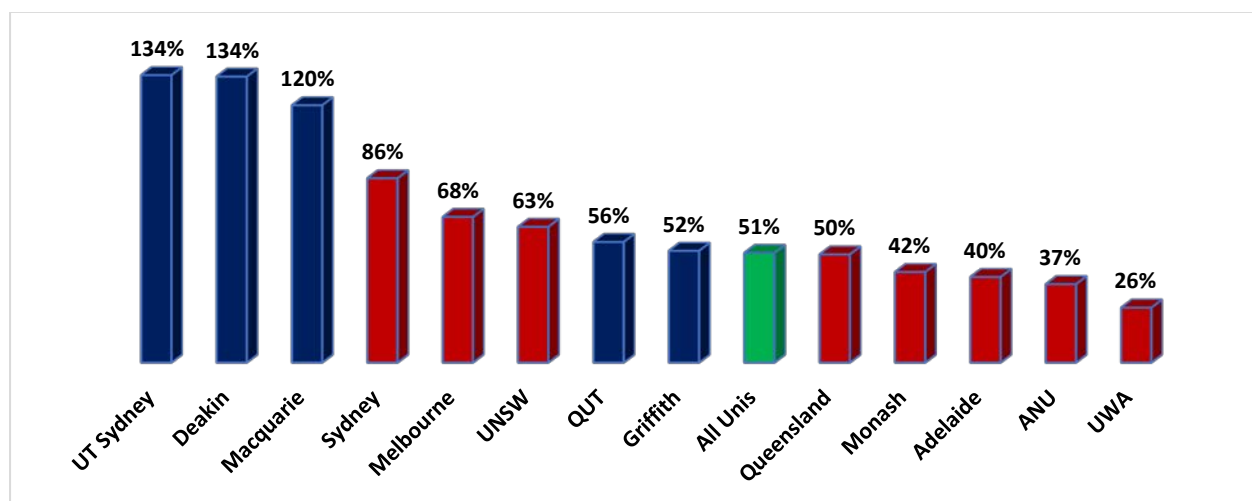
If one includes the estimated modest eight percent loss in other discretionary revenues, then the reduction in the research workforce is near 6,100 FTE. In 2018 Australian universities had 45,883 research student EFTSL and 8852 FTE research-only staff (9). A reduction of 6,100 FTE would represent a loss of nearly 11 percent in the research workforce.

3.7 Discretionary Research Funding in Relation to Total External Research Revenue

Australian research-led universities have relied increasingly over the past decade on the revenue fee margin from overseas students, relative to their domestic counterparts, to expand their research activities. A valuable insight into how important this revenue source has become can be obtained by comparing the 2018 FFOS discretionary fee income available to support research with the total external research funds obtained by universities in 2018.

The research income is reported by universities to the Department in four categories (14) ¹ This external research income is the information used by the Government to allocate the two components of the Research Block Grant (15): The Research Support Program and the Research Training Program to universities. The 2018 data for the thirteen universities in the same order as in figure 4 as well as for the sector are given in appendix 3, columns 2 and 3. The total external support for research is given in column 4. The discretionary income available is presented in column 5. This is the same data as presented in column 2 of appendix 2. Using this consistent data set, the amount of discretionary funds committed in 2018 by these universities in percentage terms is shown in column 6 relative to the total research income externally sourced. This outcome is shown graphically in figure 5 for the thirteen universities identified as the most vulnerable from figure 4, including the Go8 universities, ranked from the highest to lowest in their proportional commitment of discretionary funds to research.

Figure 5. Percentage Commitment by Universities in 2018 of Discretionary Overseas Fee Income Relative to the Total Research Funds Externally Sourced



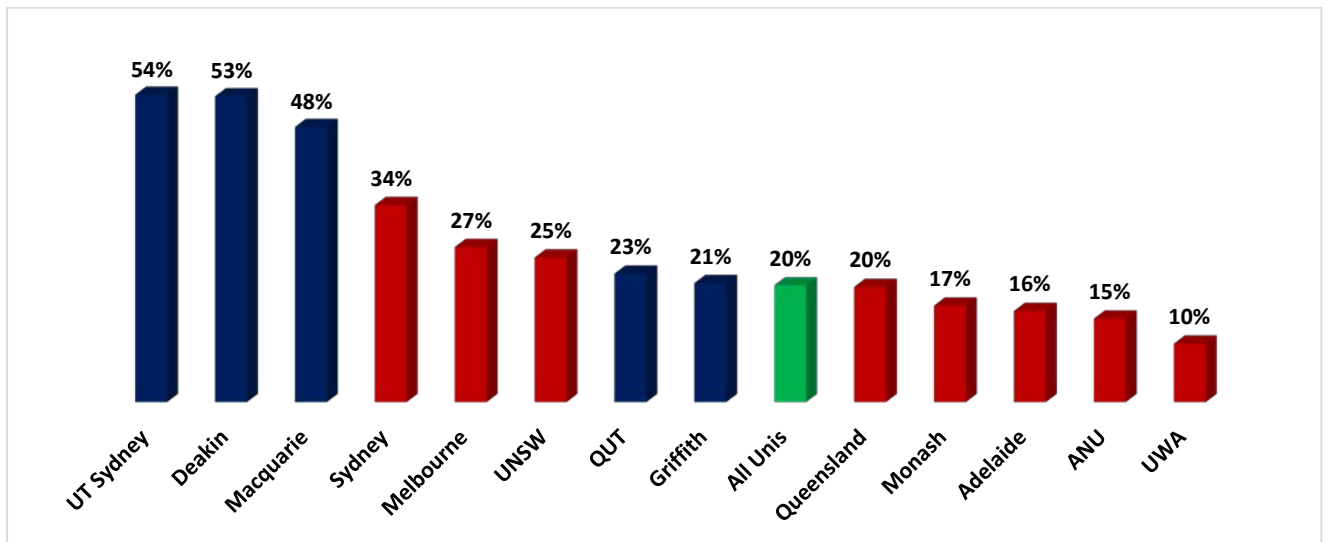
Three universities, UTS, Deakin and Macquarie **committed more discretionary income to support research in 2018 than they obtained through external grants and block funding.** This is a remarkable and concerning result. With the expected losses in discretionary income over the next five years their risk of a significant loss in research momentum without effective mitigation strategies, as discussed in section 4, is **extremely high.** Six universities, four Go8, QUT and Griffith committed discretionary funds at 50% or more of their total external income, so their risk of research momentum loss is **very high.** The four universities with a commitment of less than 50% were all G08 universities, as shown, so their risk of significant loss of research momentum is assessed as **moderately high.** It is evident that all these universities have made a strategic decision as to the level of commitment they are willing to make to support research. One strong motivating factor is the desire to improve international ranking as discussed shortly. The sector-wide average funding commitment shown was 51%. The risk of significant loss of research momentum for the other 25 universities is **modest.**

The high proportional research funding exposure to the FFOS revenue margin income now has serious consequences because of the pandemic. To illustrate this dependency, the potential

¹Category 1. Australian Competitive Grant Funding; Category 2. Other Public Sector Research Funding; Category 3. Industry and Other Funding for Research; Category 4. Cooperative Research Centre Funding.

discretionary fee losses for 2020 are shown in appendix 3 column 7. This is the same data that is presented earlier in column 3 of appendix 2. The percentage of the discretionary losses (column 7) relative to the total external income (column 4) is shown in column 8. This information is presented in figure 6 with the universities ranked according to the highest percentage.

Figure 6. Discretionary Revenue Margin Fee Loss for Thirteen Universities in 2020 as a Percentage of the Total External Research Income received by selected Universities in 2018



The data presented in figure 6 serves to highlight the vulnerability of fee-driven university research activities because of the COVID-19 pandemic. The revenue margin losses for UTS, Deakin and Macquarie amount to the equivalent of near 50% of their total external research revenue. This data serves to highlight why the risk of these universities to significantly losing research momentum in the next few years has been assessed as **extremely high**. A highly trained expert research workforce is critical to research success. Inevitable job losses will expose universities to curtailment of strategically important research programs. The six universities with 20% or more of their discretionary revenue loss relative to external research earning have a **very high risk** of significantly losing research momentum. Four Go8 universities with lower research exposure to discretionary FFOS revenue will have a **moderately high risk** of significantly losing research momentum. The other 25 universities with lower loss exposures will nevertheless face some **modest** challenges to maintain their research activities. These findings clearly underline the seriousness of the impact of the pandemic on the whole Australian university research community. FFOS losses are not the only losses that universities are experiencing as funds from other discretionary sources used to support research are also impacted because of the economic stresses caused by the pandemic.

3.8 Research Investment to Achieve University International Rankings

One motivating factor driving universities to commit large amounts of their own funds to support research activities is the strategic goal to increase international rankings. There are several ranking schemes using different methodologies. Two of the most prominent are the Times Higher Education (THE) World University Rankings (16) and the Shanghai Ranking Consultancy (SRC) Academic Rankings of World Universities (17). It is noteworthy that the

thirteen universities highlighted in this study are the most highly ranked among Australian universities with few exceptions.

The THE and SRC ranking for 2015 and for the latest years data 2020 or 2021 are presented in table 1.

Table 1. Times Higher Education and Shanghai Rating Consultancy 2015 and 2020-2021 Ranking for Thirteen Australian Universities

	Times Higher Education Rankings 2015	Times Higher Education Rankings 2021	Shanghai Academic Rankings 2015	Shanghai Academic Rankings 2020
Sydney	60	51eq	101-150	74
Melbourne	33	31	41	35
New South Wales	109	67	101-150	74
Queensland	65	62eq	77	54
Monash	83	64 eq	101-150	85
ANU	45	59	77	67
UT Sydney	226-250	160eq	301-400	201-300
Macquarie	301-350	19eq	201-300	201-300
Deakin	301-350	251-300	201-400	201-300
Adelaide	164	118eq	151-200	151-200
QUT	276-300	186	401-500	301-400
UWA	157	139	87	85
Griffith		201-250	301-400	301-400

In every case, except for ANU for the 2021 THE ranking, these universities have either maintained or improved their international standing from 2015 to the present. This outcome will be considered by university senior management as evidence to vindicate their discretionary income investment in research.

Some other Australian universities are ranked in the top 250 in 2021 by the Times Higher Education: Canberra at 184, Curtin, James Cook, Latrobe and Wollongong in the group at 201 to 250. The Shanghai rankings place, Curtin, Swinburne, Tasmania and Wollongong in the group from 201 to 300. All these universities have continued to invest in research. These seven universities along with most of the other in the 25 universities not profiled in any detail in this study are expected to have cost of teaching structures less than the Go8 and therefore it is reasonable to expect that most will have some funds available from overseas student fees to invest in research.

4. Policy Perspectives

4.1 Overview of the Challenge

The modelling undertaken for this study has enabled a quantitative assessment to be made of the impact of the losses of overseas student fee revenue by individual universities on their contributions to the national research effort. The ever-increasing discretionary incomes that universities have committed in recent years to support research does involve revenue streams beyond the fee margins on the cost of teaching. The pandemic impact on these other revenue

sources is more difficult to assess. They are considered to have a lower risk of major losses than the fee income component profiled here. This perception may change if the Australian economy further declines. Consequently, the predictions resulting from the present modelling may be viewed as conservative.

A forecast five-year revenue shortfall of \$6.4-7.6 billion and a reduction of the research workforce by 5,100 to 6,100, representing 11% in total research workforce, presents hugely significant issues for individual universities, the whole higher education sector and the Australian government.

The future will certainly be more challenging. Without the same level of discretionary funding available for the next few years there is likely to be a significant loss of research momentum. This outcome will have enduring national and international economic and social consequences. It is unlikely that strengthening industry-university research cooperation will substantially offset the funding shortfall because of the low R&D performance of Australian businesses as a percentage of GDP. This is especially so for high technology innovative industries. Universities will have to review their internal operations, become more resilient, self-reliant and enterprising, while Governments, federal and state, will need to demonstrate increased commitment in their support of research.

Irrespective of whether the shortfall in research funding is medium or longer term, there is one initiative that this present crisis might stimulate from a national research perspective. This is broader collaboration between industry, universities and government research bodies such as CSIRO, DSTO and AIMS. The success of the Cooperative Research Centre program for 30 years since 1990 demonstrates the benefits of such an approach.

The establishment of an independent '*Research and Innovation Council*' representing Private Research Institutes, Universities, Publicly Funding Government Research Agencies and Industries with a strong R&D focus has considerable merit. Such a body could provide governments with independent strategic research advice to underpin internationally competitive programs, including proposing national research priorities, important for economic development and social well-being. This Council could have a valuable role in broader public engagement promoting the national benefits of investment in research.

Past experiences highlight the inability of the higher education sector, either as a whole through Universities Australia or through its various constituent sub-groups, to be able to gain traction for research and innovation in public policy. This contrasts with the effectiveness of other industry groups such as the Australian Mining Council, the Business Council of Australia and the Australian Medical Association. Reliance on government appointments such as the Chief Scientist has proven inadequate in gaining any sustained influence in having the research perspective represented in the shaping of national policy. A separate peak body, independent of government, with high level representation from research bodies and industry is one step that might be taken to increase the profile and influence of Australian research. Australian universities are well-placed to lead on this as they represent research across all disciplines. To achieve this will require exceptional, sustained and inclusive leadership.

4.2 Initiatives by All Australian Universities

Enlightened strategic planning by Australian universities will require cost-side measures to be addressed to manage the decline in research funding. Some scaling back of research programs and the research workforce is inevitable. In its recent *Enabling Australia's Economic Recovery Through Supporting Research Excellence* paper (18) the research-intensive G08 universities identified some 10,000 research jobs being at risk, with some 4,000 on fixed term contracts due to expire between December 2020 and March 2021. The need for reforms is therefore great and immediate.

The Go8 report infers that the first casualties of a sustained reduction in funding will be the 4,000 fixed term contract researchers. Most of these fixed term staff will be research assistants, post -doctoral fellows and other early career researchers. Despite the funding challenges, it would be short-sighted simply to terminate the employment of fixed term researchers without due consideration of their contribution to and the relevance of the research they are undertaking. Opportunities for research training are likely to be more limited as less money may be available for scholarships and stipends.

One necessary initiative is a rigorous reappraisal of institutional research strengths and potential capabilities, combined with a willingness to wind out research programs that either are relatively underperforming in quality or output or are poorly aligned with institutional strengths or perceived national priorities. One outcome of this appraisal may be a consolidation of cognate research programs which may in turn lead to increased performance and sustainability. Another separate, but related initiative, would be a review of individual researcher performance, presumably guided by reference to clearly articulated and previously adopted 'research activity' benchmarks. These actions, combined with a disciplined analysis of all other university expenditure, including on administrative services and overheads and other discretionary expenditure, to identify further savings may mitigate the need for further expenditure savings in high performing research areas. Indeed, these are areas where desirably additional investment should occur.

4.3 Initiatives by Individual Universities

For individual universities, especially for those where the severity of the research challenge is highest, there are several policy choices that might be considered in response to this revenue shortfall. Clearly, the least impactful of these are measures designed to grow revenue streams that will substitute for the current loss of international student fee income.

A high priority must be restoring as quickly as possible existing international student markets or building new markets in other countries. International student fees will continue to generate the highest margins that might be directed towards supporting research. Shoring up global rankings, especially in the apparently more student sensitive Times Higher Education rankings, is important because of the well-established link between high global rankings and the ability to charge international students premium fee levels. This will require targeted investment to ensure continued high performance against the criteria on which global rankings are based.

The likely increased demand for university places both as a result of the COVID-19 pandemic and demographic changes increase the feasibility of domestic enrolment growth in the 2021-24 period. Using the increased flexibility afforded by the Government's Job-ready Graduates legislation, assuming it is enacted broadly in its introduced form, will enable some universities

to allocate an increased number of places for domestic students to grow their overall revenue. However, given funding rates at or around the average cost of teaching, margins on this additional revenue may be slim unless universities are able to improve overall productivity or achieve significant economies of scale when increasing enrolments.

Securing increases in other revenue sources will continue to be an important source of funding whether these sources directly fund research (as in the case of targeted philanthropy or contracted work) or are untied as to specific purpose. However, the financial impact of the pandemic is likely to have diminished the capacity of industry, philanthropic organisations and private individuals to increase their relative contributions to university finances. The best Australian universities may be able to plan for over the medium term would be the maintenance of current revenue levels. Two modest revenue growth prospects for some Australian universities might be the commercialization of their curriculum content (where they have managed to develop world class materials and delivery mechanisms) and for professionally-oriented programs an expansion of continuing professional development programs in an area often neglected by the university sector.

4.4 Initiatives by Governments

There are major public policy issues for the Australian Government because of the decline in university research funding.

An acknowledgement that there is indeed a crisis in terms of university research that requires a policy response would be an important first step. To date, such a response has been muted with the establishment of a Research Sustainability Working Group (19) to report later in the year being the main public intervention. This contrasts with the speed with which the Government has sought to refocus university teaching and learning through its Job-Ready Graduates legislation currently under consideration within the Australian Senate.

State governments also should be concerned about the impact of the pandemic on the research contributions universities are making to state and regional economies. States have a role in developing more targeted research programs with regional economic and social benefit.

There are several initiatives that the Australian Government might usefully undertake to deal with the decline in research funding. Increasing collaboration with the higher education sector to facilitate as quickly as possible the availability of on-campus and blended learning for international students is essential. The development of new or emerging student markets will be important as well as the recovery of existing key markets so that there is a greater diversity in the Australian university international student profile in the future.

Building a more robust framework for funding Australian university research is an urgent priority. Undoubtedly, the most vexed issue is the underfunding of the indirect costs of research linked to competitive grants and contracts. This is an unresolved policy issue of critical importance that has been advocated by universities for at least two decades. A greater concentration of the allocation of public research funding into priority areas with the investment being restricted to those institutions or research teams with a demonstrated track record in the conduct and/or translation of world class research is desirable.

Improving productivity of the peer-reviewed grant funding process by introducing some form of university-based eligibility criteria that effectively allows grant application success rates to

increase from a current highly inefficient and unproductive 16-17% to at least 30-35% would have economic benefits to universities. Furthermore, the relatively large and disparate number of research grant programs are expensive, wasteful of resources and time-consuming for universities to administer. Some consolidation and devolution to universities would increase grant management efficiency.

The current and increasing proportional decline in industry investment for research and development is a structural weakness in Australia's national R&D framework. In a post COVID-19 world the need for business and industry to become more committed to R&D seems inarguable. More incentives to industry to increase investment in research and innovation is timely, whether by way of a renewal of R&D tax concessions or other mechanisms. Universities will benefit through partnerships in developing and implementing new technologies and other capabilities that provide the most secure route to strengthening longer term national resilience.

Fundamentally, more cooperation and increased collaborative investment by all sectors, industry, governments, universities and private research institutions, are essential for Australia to strengthen its internationally competitive research and innovation position in a post COVID-19 world.

Acknowledgements We thank William Locke, Gwilym Croucher, and Arnaldo Barone for their most helpful comments on this manuscript.

Frank Larkins is currently an Emeritus Professor and Honorary Professorial Fellow at The University of Melbourne. He is a former Deputy Vice Chancellor from that university with portfolio responsibilities for research and global engagement. Many of his writings on higher education policy can be sourced from the Melbourne CSHE website or from franklarkins.wordpress.com

Ian Marshman is currently an Associate Professor and Honorary Professorial Fellow at The University of Melbourne. He is a former Senior Vice-Principal ('Chief Operating Officer') where he was accountable to the Vice-Chancellor and Council for the overall administration and operational management of the University. Some of his writings can be sourced from the Melbourne CSHE website.

5. References

1. I. Marshman and F. Larkins, *Modelling Individual Australia Universities in Managing Overseas Student Revenue Losses From the COVID-19 Pandemic*, published 28 May 2020, <https://melbourne-cshe.unimelb.edu.au/lh-martin-institute/insights/modelling-individual-australian-universities-resilience-in-managing-overseas-student-revenue-losses-from-the-covid-19-pandemic>
2. F. Larkins, *Strong Research Performances by Australian Universities Depend Increasingly on Unsustainable Internal Discretionary Funding*, published 27 July 2020, <https://melbourne-cshe.unimelb.edu.au/lh-martin-institute/fellow-voices/strong-research-performances>
3. F. Larkins and I Marshman, *Shortfall of More than \$7 billion in University Research Funding and 4,600 Research Job Losses Predicted Over the Next Five years*, published 13 August 2020, <https://campusmorningmail.com.au/news/research-funding-crisis-imminent-andenormous-2/>

4. Deloitte Access Economics, *Transparency in Higher Education Expenditure*, January 2019, <https://docs.education.gov.au/documents/2018-transparency-higher-education-expenditure-publication>
5. Australian Government Department of Education, Skills and Employment, *Job-ready Graduates Higher Education Reform Package 2020*, 8 July 2020, <https://www.dese.gov.au/document/job-ready-graduates-discussion-paper>
6. V, Massaro, Funding Model inadequate on teaching quality and standards, 15 July 2020, <https://campusmorningmail.com.au/news/funding-model-inadequate-on-teaching-quality-and-standards/>
7. Australian Government Department of Education, Skills and Employment, *Finance Publication*, 2018 <https://www.education.gov.au/finance-publication>
8. Australian Government Department of Education, Skills and Employment, *Overseas Student Data*, 2018, <https://www.education.gov.au/student-data>
9. F. Larkins, and I Marshman, *Australian Universities Student Recruitment: Financing Strategies and Outcomes 2004 to 2014*, 2 March 2016, <https://franklarkins.files.wordpress.com/2018/11/a23-aus-higher-education-policy-analysis-overseas-students-recruitment-flarkins-imarshman-mar2016.pdf>
10. Universities Australia Submission, August 2020, <https://www.universitiesaustralia.edu.au/wp-content/uploads/2020/09/200824-Submission-2020-21-Pre-Budget-Submission.pdf>
11. F. Larkins, *Decade Financial Performances of Five Multi-Billion Dollar Australian Universities: 2009 to 2018*, published 10 December 2019, <https://melbourne-cshe.unimelb.edu.au/lh-martin-institute/news/decade-financial-performances-of-five-multi-billion-dollar-australian-universities-2009-to-2018>
12. F. Larkins, *Major Student and Staff Profile Changes Since 2009 by Australia's Multi-Billion Dollars Universities*, published 30 January 2020, <https://melbourne-cshe.unimelb.edu.au/lh-martin-institute/news/major-student-and-staff-profile-changes-since-2009-by-australias-multi-billion-dollar-universities>
13. Australian Bureau of Statistics, *Research and Experimental Development Performance of Australian Higher Education Organisations*, Australian 2018 Published 20 May 2020 <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8111.02018>
14. Australian Government, Department of Education, Skills and Employment, 22 December 2017, *Research Income Data (1994-2018)*, <https://docs.education.gov.au/node/47851>
15. Australian Government, Department of Education, Skills and Employment, 22 December 2017, *Research Block Grants*, <https://www.education.gov.au/news/2018-research-block-grant-allocations-released>
16. Times Higher Education, *World University Rankings 2021*, https://www.timeshighereducation.com/world-university-rankings/2021/world-ranking#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats
17. ShanghaiRanking Consultancy, *Academic Rankings of World Universities 2020* <http://www.shanghairanking.com/World-University-Rankings-2020/Australia.html>
18. Go8 Universities, *Enabling Australia's Recovery through Supporting Research Excellence*, 8 September 2020, https://go8.edu.au/wp-content/uploads/2020/09/Go8_Research-Excellence.pdf
19. Research Sustainability Working Group, Ministerial Media release, 1 July 2020, <https://ministers.dese.gov.au/tehan/national-priorities-and-industry-linkage-fund-working-group>

Appendix 1. Overseas Student Load, Revenue and Cost of Teaching Margin, 2018

Overseas Students 2018 All Universities	TOTAL EFTSL	2018 FFOS \$ '000s	FFOS \$/EFTSL	Margin Relative to Av Cost Teaching at \$18,900	Overseas Student Income above the Margin \$'000s
All Universities	2	3	4	5	6
Group A			Col 3/Col 2	Col 4-\$18,900	Col 5*Col 2
Sydney	20,762	\$884,693	\$42,611	\$23,711	\$492,291
Melbourne	22,386	\$879,312	\$39,280	\$20,380	\$456,217
Monash	32,022	\$851,989	\$26,606	\$7,706	\$246,773
NSW	18,447	\$712,461	\$38,622	\$19,722	\$363,813
Queensland	14,729	\$572,698	\$38,882	\$19,982	\$294,320
Group B					
RMIT	23,559	\$463,206	\$19,662	\$762	\$17,941
UT Sydney	11,707	\$362,464	\$30,961	\$12,061	\$141,202
Deakin	11,099	\$343,208	\$30,922	\$12,022	\$133,437
ANU	8,490	\$320,871	\$37,794	\$18,894	\$160,410
Macquarie	9,118	\$309,280	\$33,920	\$15,020	\$136,950
Adelaide	6,183	\$224,511	\$36,311	\$17,411	\$107,652
QUT	7,078	\$218,057	\$30,808	\$11,908	\$84,283
Group C					
Griffith	6,303	\$181,477	\$28,792	\$9,892	\$62,350
Wollongong	10,980	\$169,034	\$15,395	-\$3,505	
Curtin	10,153	\$164,694	\$16,221	-\$2,679	
Charles S.	6,528	\$158,471	\$24,276	\$5,376	\$35,092
La Trobe	7,143	\$158,433	\$22,180	\$3,280	\$23,430
Swinburne	7,998	\$157,089	\$19,641	\$741	\$5,927
UWA	4,403	\$152,774	\$34,698	\$15,798	\$69,557
CQU	5,615	\$144,742	\$25,778	\$6,878	\$38,619
West. Syd	5,607	\$132,618	\$23,652	\$4,752	\$26,646
Federation	5,659	\$127,724	\$22,570	\$3,670	\$20,769
USA	4,477	\$123,764	\$27,644	\$8,744	\$39,149
Tasmania	5,563	\$117,201	\$21,068	\$2,168	\$12,060
Newcastle	4,355	\$114,425	\$26,274	\$7,374	\$32,116
Edith Cowan	4,120	\$101,270	\$24,580	\$5,680	\$23,402
Group D					
Flinders	3,627	\$93,723	\$25,840	\$6,940	\$25,173
Victoria	8,233	\$89,038	\$10,815	-\$8,085	
James Cook	5,052	\$74,071	\$14,662	-\$4,238	
Southern C.	3,347	\$73,996	\$22,108	\$3,208	\$10,738
ACU	3,420	\$70,221	\$20,532	\$1,632	\$5,583
Sun. Coast	2,725	\$66,467	\$24,392	\$5,492	\$14,965
Murdoch	5,935	\$58,286	\$9,821	-\$9,079	
Canberra	2,416	\$56,667	\$23,455	\$4,555	\$11,005
South'n Qld	1,933	\$45,223	\$23,395	\$4,495	\$8,689
Charles D.	1,428	\$36,420	\$25,504	\$6,604	\$9,431
New England	993	\$24,423	\$24,595	\$5,695	\$5,655
Notre Dame	160	\$3,890	\$24,313	\$5,413	\$866
TOTAL	313,753	8,838,891	\$28,171	\$9,271	3,116,508

Appendix 2. Estimated Discretionary Income Losses from Overseas Student Cost of Teaching Margin Shortfall, 2020 to 2024

All Universities	2018 FFOS Discretionary Income \$'000s	Discretionary Loss - 40% 2020 \$'000s	Discretionary Loss - 55% 2021 \$'000s	Discretionary Loss - 50% 2022 \$'000s	Discretionary Loss - 35% 2023 \$'000s	Discretionary Loss - 25% 2024 \$'000s	Discretionary Loss 2020-2024 - 205% \$'000s
Group A	2	3	4	5	6	7	8
Sydney	\$492,291	\$196,916	\$270,760	\$246,146	\$172,302	\$123,073	\$1,009,197
Melbourne	\$456,217	\$182,487	\$250,919	\$228,108	\$159,676	\$114,054	\$935,244
Monash	\$246,773	\$98,709	\$135,725	\$123,387	\$86,371	\$61,693	\$505,885
NSW	\$363,813	\$145,525	\$200,097	\$181,906	\$127,334	\$90,953	\$745,816
Queensland	\$294,320	\$117,728	\$161,876	\$147,160	\$103,012	\$73,580	\$603,356
Group B							
RMIT	\$17,941	\$7,176	\$9,867	\$8,970	\$6,279	\$4,485	\$36,779
UT Sydney	\$141,202	\$56,481	\$77,661	\$70,601	\$49,421	\$35,300	\$289,463
Deakin	\$133,437	\$53,375	\$73,390	\$66,718	\$46,703	\$33,359	\$273,546
ANU	\$160,410	\$64,164	\$88,226	\$80,205	\$56,144	\$40,103	\$328,841
Macquarie	\$136,950	\$54,780	\$75,322	\$68,475	\$47,932	\$34,237	\$280,747
Adelaide	\$107,652	\$43,061	\$59,209	\$53,826	\$37,678	\$26,913	\$220,687
QUT	\$84,283	\$33,713	\$46,356	\$42,141	\$29,499	\$21,071	\$172,780
Group C							
Griffith	\$62,350	\$24,940	\$34,293	\$31,175	\$21,823	\$15,588	\$127,818
Wollongong		\$0	\$0	\$0	\$0	\$0	\$0
Curtin		\$0	\$0	\$0	\$0	\$0	\$0
Charles S.	\$35,092	\$14,037	\$19,300	\$17,546	\$12,282	\$8,773	\$71,938
La Trobe	\$23,430	\$9,372	\$12,887	\$11,715	\$8,201	\$5,858	\$48,032
Swinburne	\$5,927	\$2,371	\$3,260	\$2,963	\$2,074	\$1,482	\$12,150
UWA	\$69,557	\$27,823	\$38,257	\$34,779	\$24,345	\$17,389	\$142,592
CQU	\$38,619	\$15,447	\$21,240	\$19,309	\$13,516	\$9,655	\$79,168
West. Syd	\$26,646	\$10,658	\$14,655	\$13,323	\$9,326	\$6,661	\$54,624
Federation	\$20,769	\$8,308	\$11,423	\$10,384	\$7,269	\$5,192	\$42,576
USA	\$39,149	\$15,659	\$21,532	\$19,574	\$13,702	\$9,787	\$80,255
Tasmania	\$12,060	\$4,824	\$6,633	\$6,030	\$4,221	\$3,015	\$24,724
Newcastle	\$32,116	\$12,846	\$17,664	\$16,058	\$11,240	\$8,029	\$65,837
Edith Cowan	\$23,402	\$9,361	\$12,871	\$11,701	\$8,191	\$5,851	\$47,974
Group D							
Flinders	\$25,173	\$10,069	\$13,845	\$12,586	\$8,810	\$6,293	\$51,604
Victoria		\$0	\$0	\$0	\$0	\$0	\$0
James Cook		\$0	\$0	\$0	\$0	\$0	\$0
Southern C.	\$10,738	\$4,295	\$5,906	\$5,369	\$3,758	\$2,684	\$22,012
ACU	\$5,583	\$2,233	\$3,071	\$2,792	\$1,954	\$1,396	\$11,445
Sun. Coast	\$14,965	\$5,986	\$8,230	\$7,482	\$5,238	\$3,741	\$30,677
Murdoch		\$0	\$0	\$0	\$0	\$0	\$0
Canberra	\$11,005	\$4,402	\$6,053	\$5,502	\$3,852	\$2,751	\$22,559
South'n Qld	\$8,689	\$3,476	\$4,779	\$4,345	\$3,041	\$2,172	\$17,813
Charles D.	\$9,431	\$3,772	\$5,187	\$4,715	\$3,301	\$2,358	\$19,333
New England	\$5,655	\$2,262	\$3,110	\$2,828	\$1,979	\$1,414	\$11,593
Notre Dame	\$866	\$346	\$476	\$433	\$303	\$217	\$1,775
TOTAL	\$3,116,508	\$1,246,603	\$1,714,079	\$1,558,254	\$1,090,778	\$779,127	\$6,388,841
Net Funds	\$3,116,508	\$1,869,905	\$1,402,429	\$1,558,254	\$2,025,730	\$2,337,381	\$9,193,699

Appendix 3 External Research Income and Block Grants for 2018 along with the predicted Fee-Related Discretionary Shortfall for 2020.

Thirteen Universities with Largest Discretionary Fee Losses (Figure 4)	2018 Research Income Ref 14 \$'000s	2018 Research Block Grant Ref 15 \$'000s	Total Research Income Col2+Col3 \$'000s	2018 FFOS Discretionary Income (Appendix 2 Col 2) \$'000s	Discretionary Income as % Total Research Income Col5/Col4	Discretionary Fee Loss 2020 (Appendix 2 Col3) \$'000s	Discretionary Fee Loss as % Total Research Income Col7/Col 4
	2	3	4	5	6	7	8
Sydney	\$386,735	\$185,548	\$572,282	\$492,291	86.0%	\$196,916	34.4%
Melbourne	\$474,282	\$197,298	\$671,580	\$456,217	67.9%	\$182,487	27.2%
UNSW	\$405,050	\$169,417	\$574,467	\$363,813	63.3%	\$145,525	25.3%
Queensland	\$396,396	\$187,013	\$583,410	\$294,320	50.4%	\$117,728	20.2%
Monash	\$413,845	\$170,340	\$584,185	\$246,773	42.2%	\$98,709	16.9%
ANU	\$318,323	\$120,237	\$438,560	\$160,410	36.6%	\$64,164	14.6%
UT Sydney	\$75,586	\$29,577	\$105,163	\$141,202	134.3%	\$56,481	53.7%
Macquarie	\$70,045	\$43,897	\$113,942	\$136,950	120.2%	\$54,780	48.1%
Deakin	\$68,584	\$31,298	\$99,882	\$133,437	133.6%	\$53,375	53.4%
Adelaide	\$181,582	\$88,053	\$269,632	\$107,652	39.9%	\$43,061	16.0%
QUT	\$96,232	\$53,586	\$149,817	\$84,283	56.3%	\$33,713	22.5%
UWA	\$177,126	\$94,467	\$271,593	\$69,557	25.6%	\$27,823	10.2%
Griffith	\$79,126	\$40,450	\$119,576	\$62,350	52.1%	\$24,940	20.9%
All Unis	4,169,794	1,921,099	\$6,090,893	\$3,113,508	51.1%	1,246,603	20.5%