

# The financial health of Australian universities: policy implications in a changing environment

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## Abstract

**Purpose** – In the context of the Australian Government's attempts to impose budget austerity measures on publicly funded universities in its higher education sector, the purpose of this paper is to assess the sector's financial health.

**Design/methodology/approach** – The multi-dimensional study is based on seven years of government financial data from all 39 publicly funded Australian universities, supplemented by information from universities' annual reports. Using a financial health model that reflects vulnerability, viability and resilience, the authors examine sector data using a suite of metrics. The authors analyse differences between those universities in the Top 10 and Bottom 10 by revenue, as a window into the financial health of the sector at large.

**Findings** – While mostly financially viable, the sector shows signs of financial vulnerability, particularly in the areas of expense control and financial sustainability. Possibly in response to an uncertain funding environment, universities are managing long-term liquidity by growing reserves. Debt represents largely untapped potential for universities, while differences between the Top 10 and Bottom 10 universities were most evident in the area of revenue diversity, a strong predictor of financial viability.

**Research limitations/implications** – Focussing on a specific set of financial metrics limits the scope of the study, but highlights further research possibilities. These include more detailed statistical analysis of data, financial case studies of individual universities and the implications of revenue diversification on academic standards.

**Originality/value** – The paper contributes to higher education literature, providing empirical evidence of universities' finances. It highlights the importance of universities' financial resilience in an uncertain funding environment.

**Keywords** Australian higher education sector, Financial health, Budget austerity, Higher education funding policy

**Paper type** Research paper

## 1. Introduction

Globally, the tertiary education sector has expanded massively over the last few decades (British Council, 2012). This has raised the issue of how higher education is to be funded, particularly in times of fiscal pressure (Bowl and Hughes, 2016). Governments are now on a trajectory of reducing public funding, based on New Public Management (NPM) practices, responses to the Global Financial Crisis (GFC) and subsequent calls for austerity (Ahrens and Ferry, 2015; Bracci *et al.*, 2015; Cohen *et al.*, 2015). Consequently, there have been reductions in the public funding of the higher education sector (HES), and increased debate about HES policy (Neu *et al.*, 2008).

Rather than being based on a principled understanding of the implications of government funding policies for universities, the sector and society, these changes have resulted in a HES in turmoil in numerous jurisdictions, being reconstructed in an economically utilitarian manner (Harney and Dunne, 2013). The turmoil in the sector globally is also evident in Australia, with extensive critique of the cost of government funding models, and concerns about university enrolment policies, graduation rates, the provision of equitable opportunities for a university education and the division between the HES and vocational training (Mackenzie, 2018).



The challenges facing the HES have been extensively canvassed in academic literature in numerous ways: philosophical (Roberts, 2004), political (Parker, 2011), teaching pedagogy (Christensen, 2004), research (Martin-Sardesai *et al.*, 2017), managerialism (Christopher, 2012) and the development of government policy (Neumann and Guthrie, 2002). However, there has been no sustained body of work considering the financial resilience of universities. This is particularly relevant in the Australian context.

Successive Labor and Coalition Governments have demonstrated an appetite for “budget repair”. This involves reducing Australia’s debt by balancing the budget through increased government revenues and reduced government expenditure. Various budgetary measures have been proposed through which the HES can contribute to this endeavour (Marginson, 2013; Warburton, 2016). These include proposals to further reduce funding and de-regulate the sector, and currently, the implementation of a freeze on student funding for university bachelor’s degrees (Creighton, 2018). This effective reduction in funding has been estimated at 1.5 per cent in real terms, or a funding reduction equivalent to 10,000 places, and, it has been suggested, is likely to result in universities’ managing costs by closing campuses or programmes, in order to continue to operate (Clarke, 2018).

Uncertainty and anxiety about the stability and sustainability of financing for the sector abounds, despite a plethora of government reports, proposed legislation and policy analysis, significant media coverage and surveys of students and staff (DEEWR, 2009; National Commission of Audit, 2014a, b; Hare, 2015b; Australian Government, 2016b; Hughes-Warrington, 2017; Lacy *et al.*, 2017). This is arguably fuelled by a neoliberal agenda which emphasises competition and corporate-style management, including a reduction in public funding (Parker, 2011). In this uncertain policy environment, it has been suggested, some universities will not be financially resilient enough to absorb proposed funding cuts and continue to meet student demand (The Senate, 2017; Robinson, 2018).

Despite this uncertainty, there is a lack of academic attention given to universities’ finances, and a “dearth of timely and targeted information” about the costs and operations of universities (Hare, 2015a). The objective of this paper, therefore, is to assess the financial health of Australian universities that operate as Not-for-Profit (NFP), public sector organisations (Productivity Commission, 2010). This is a response to the call by Bracci *et al.* (2015) for research providing accounts of austerity measures and their implications in a variety of contexts (Cohen *et al.*, 2015). With uncertainty in the Australian university sector context, it aligns with NFP literature on the ability of organisations to survive “financial shocks” and economic downturns (Tuckman and Chang, 1991, p. 445).

In undertaking this objective, we distinguish between financial vulnerability, viability and resilience as dimensions of financial health. These financial dimensions are at the heart of long-term mission delivery (Ryan and Irvine, 2012; Booth, 2016). Prior studies in the NFP sector identify these dimensions of financial health as crucial in determining organisations’ ability to continue to provide services in a changing environment, particularly when funding cutbacks occur (Booth, 2016). Financially vulnerable organisations are those whose resources and capabilities are inadequate to continue their current level of operations; financially viable organisations are capable of continuing their operations, at least in the immediate future; and financially resilient organisations demonstrate financial capacity to maintain service delivery when faced with financial downturns (Tuckman and Chang, 1991).

In order to assess the financial health of Australian universities we analyse publicly available financial data of all 39 publicly funded universities over a seven-year period, using a suite of metrics adapted from Ryan and Irvine (2012) to measure revenue, expenses, debt, liquidity and financial sustainability. This enables us to assess whether the sector is financially vulnerable, viable or resilient. If the sector is to continue to achieve its mission over

the longer term, universities will need to be financially healthy in order to respond effectively to changes in the external environment, such as funding cutbacks. Universities need to be resilient if they are to survive, and society needs a population of resilient universities.

Global changes in the HES have led to a call for “more empirical studies in the area” (Goedegebuure and Hayden, 2007, p. 9). This study makes contributions to academic literature and public debate about the financial health of universities in Australia. Although “[m]anagerialism in Australian universities has diverted the dominant discourse from pedagogy to financial viability” (Christensen, 2004, p. 485), few academic studies have explored the issue of financial health by relying on empirical data about Australian universities. By providing such evidence, our aim is to inform public policy debate about the challenges in balancing the higher education needs of Australian society against the financial realities that dictate the need for austerity measures designed to achieve budgetary repair.

The paper proceeds as follows. Next, we contextualise the changes faced by the HES globally, and outline the Australian situation. We then formulate five specific research questions that enable us to assess Australian universities’ financial health. After outlining the method by which the study was conducted, we present our findings, and then outline the implications of these in the final section.

## 2. Global trends and the Australian HES

Changes in the HES sector are evident in advanced OECD countries (see e.g. McCaig and Taylor, 2017). They are also evident in a range of divergent and emerging economies (see e.g. Carnoy *et al.*, 2014). These changes emanate from at least two major global factors, which are then manifest in local jurisdictions. First, public sector changes at large, and in public universities, have resulted from the outworking of the NPM emphases on corporatisation, competition and commercialisation (Neu *et al.*, 2008; Parker, 2011). This trend inevitably results in a changing relationship between the state and higher education institutions (Brunner, 1993; Goedegebuure and Hayden, 2007). A NPM agenda necessitates universities’ functioning increasingly as businesses in the highly politicised HES (Parker, 2012; McCaig and Taylor, 2017).

Second, global and national economic recessions, and particularly the GFC of 2008–2011 and its ongoing effects, have resulted in calls for budget austerity, attempts at budget repair, the reduction of “unsustainable levels of public debt and expenditure” and consequent cutbacks in government spending (Bracci *et al.*, 2015, p. 881). These responses increasingly acknowledge that higher education, as well as providing public benefits (Lewis and Pendlebury, 2002), provides significant private benefits (Perna, 2003; Marginson, 2013). These justify its funding being shared between governments and individuals. In acknowledging this, these responses arguably address neoliberal “economic utilitarian objectives” being designed to align higher education with national economic and development goals (Walsh and Loxley, 2015, p. 1128). The response by universities to government demands and uncertain funding environments has been the adoption of a commercial mode of operations, with increasing managerialism, marketing and financialisation in the pursuit of financial viability (Lawrence and Sharma, 2002; Bowl and Hughes, 2016).

These trends are evident in Australia, where, similar to other jurisdictions, the HES is both economically and politically significant (The Senate, 2017)[1]. The government goal of increasing the percentage of younger Australians with a university education becomes problematic when balanced against the global trend for governments to retreat from earlier commitments to funding higher education (Marginson, 2002). It is unsurprising, therefore, that public policy about university funding has been described as “incoherent” and “a long problem without a solution”, as debate proliferates about who will be responsible for funding the expansion of higher education (Marginson, 2013, pp. 69, 59). This dilemma is heightened by the fact that, as already highlighted, higher education produces private benefits to

individuals, despite ongoing arguments that governments have a moral obligation to fund higher education, and that public policy goals cannot be achieved by requiring universities or students to absorb government funding cutbacks (Universities Australia, 2016).

Funding cutbacks to the HES are based on a heightened awareness of the need to balance the budget, and the conviction that universities themselves should be responsible for ensuring the financial sustainability of the sector and contributing to budget repair (Warburton, 2016; The Senate, 2017). This view maintains that universities can afford to absorb these cuts and “tighten their belts” (Hare, 2017b). It is reinforced by the assertion, in some quarters, that universities are “inefficient bureaucracies, with bloated administrations and over-paid vice chancellors” (Gittins, 2017). In spite of these arguments, and the suggestion that under their current business models, Australian universities would not survive to 2025 (Bokor, 2012), it has been reported that “hard data in relation to university revenue versus expenditure clearly supports [a] modest funding decrease” since “[u]niversities continue to generate more revenue than they expend, and maintain a surplus of 6.1 per cent on average” (The Senate, 2017, p. 30).

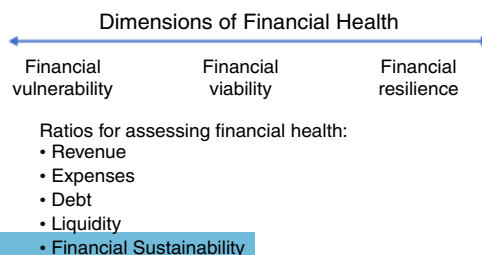
Public funding of Australian universities has progressively evolved to the current arrangement, consisting of four elements: government direct grants (primarily for teaching) to higher education institutions; student loans for undergraduate fees, paid directly to universities by the government, and later repaid by students[2]; income support for students, paid to them directly; and research grants paid directly to higher education institutions (Norton and Cakitaki, 2016). The balancing of these components represents a political conundrum that acknowledges higher education as both a public and a private good[3], accessible through competitive market forces (Marginson, 2013). However, there is ongoing dispute about the issue of who should fund it. With divergent opinions abounding, there is a need for evidence-based research that assesses the important issue of universities’ financial health in the uncertain government funding environment.

### 3. Assessing universities’ financial health

As already indicated, we adopt a suite of financial ratios demonstrated by Ryan and Irvine (2012) as being useful for assessing the financial health of NFP organisations. We adapt it to assess dimensions of the financial health of Australian universities, i.e. their vulnerability, viability or resilience. The five research questions we develop below follow the model outlined in Figure 1, and the ratios we identify are summarised in Table AI.

#### 3.1 Revenue

A 2008 review of the Australian HES recommended major reforms, which were activated by the Labor Government. The allocation of undergraduate places for domestic students, previously “capped” by the government, was “uncapped” with the introduction of a “demand-driven” system, the purpose of which was to increase the accessibility of a university education, particularly for students from diverse backgrounds (Doyle, 2017).



**Figure 1.** A model for assessing the financial health of the university sector

This process began in 2010, culminating in a full deregulation of the market for undergraduate places in 2012 (Dow, 2013). Thus from 2012, universities have been able to respond to domestic student demand for courses. This has incentivised universities to boost admission levels, resulting in a rapid growth in government-funded enrolments, from 469,000 in 2009 to 615,000 in 2016 (Doyle, 2017). The consequence of this has been an increase in revenue for universities, funded by government loans to domestic students. While Australian universities have embraced and supported this new system as being more equitable, and necessary economically as an investment in education and training for the future. However, the system has attracted criticism on a political level, with the recognition that limiting undergraduate student places could save the government a considerable amount, thus addressing the issue of budget repair.

The growth in domestic student enrolments has not diminished universities' need to seek alternate funding, with public funding now reportedly representing approximately half of their revenues (Lacy *et al.*, 2017). Leaders in Australian universities, aware for many years of the danger of relying too heavily on a single type of revenue, have been diversifying their revenue streams (de Zilwa, 2005). This is strategic, given their recognition of the high likelihood of a continuing reduction in government funding as a proportion of universities' total revenue (Bokor, 2012). It has been predicted that in the future there will be more privatisation, and a greater focus on philanthropy, loans and the development of alternate funding streams (Lacy *et al.*, 2017). There have been substantial differences in universities' reliance on public funding and their capacity for attracting private funding from external sources, with elite institutions demonstrating greater success in expanding their revenue sources (Carnoy *et al.*, 2014).

These trends are consistent with a NFP environment, where organisations seek to develop multiple sources of revenue in order to decrease their risk of financial vulnerability (Booth *et al.*, 2017; Thomas and Trafford, 2013). Universities, operating in a NPM environment, face public funding challenges, and consequently are developing a "self-generating profit oriented [higher education] business model" (Parker, 2012, p. 247). This includes fostering industry cooperation[4] and the diversification of revenue sources, including philanthropic contributions, in order to develop alternate funding streams (Hermannsson *et al.*, 2015). One of these is the overseas higher education student market, which is reportedly one of the largest sources of export revenue for Australia (Parker and Guthrie, 2010). By operating as businesses, in order to boost revenues, universities adopt commercial, entrepreneurial practices, market themselves for both students and donors, and employ professional fundraisers (Parker, 2011, 2012).

In the light of these developments, including the potential for increasing disparities in the ability of universities to adapt to the need for increased and more diverse funding, we ask the following question:

*RQ1.* What is the revenue health of Australian universities?

### 3.2 Expenses

NPM terms such as economy, efficiency and performance have become part of the language of universities as they increasingly operate as businesses (Nagy and Robb, 2008). Particularly over the last decade, Australian universities have been identified as showing "signs of strain", with cost-cutting evident in the stabilising of staff numbers while student numbers have grown significantly, and a need for ongoing cost containment in the face of decreasing revenues from government (Norton and Cakitaki, 2016, p. 55). On the one hand, it is claimed there is a need for efficiency improvements (Houghton, 2017). Another view recognises a productivity increase across the sector of 15.2 per cent from 2007 to 2013, and questions whether it would make more sense to impose funding cuts only on universities that are inefficient (Lane, 2017a).

In the NFP sector, stakeholders are interested in the proportion of charities' expenditure that goes towards addressing organisational mission, with criticism of those organisations that spend excessive amounts on administration (Ryan and Irvine, 2012). Because public universities are not judged primarily by their profit, but have a mission of teaching and research, what they spend their funds on is of interest to stakeholders, particularly the extent to which research expenditure is funded by teaching revenues (Ratnatunga and Waldmann, 2010; Knott, 2015; Parker *et al.*, 2018), or some courses are cross-subsidised by other more lucrative revenue sources (Guthrie and Parker, 2014). Relative expenditure by universities on administrative and academic salaries has attracted ongoing attention (Norton and Cakitaki, 2016). The Australian Productivity Commission (2017), in its five year productivity review, identified one of the risks of the HES as its "administration costs and arrangements", and questioned whether they had become "overly bureaucratic and expensive to maintain" (p. 101).

As expenses are one crucial component of the financial health of Australian universities, we ask the following question:

*RQ2.* What is the expense health of Australian universities?

### 3.3 Debt

NFP organisations carry both operational debt (e.g. accounts payable and provisions) and interest-bearing debt. Operational debt has implications for cash flow and liquidity, while interest-bearing debt has an impact on liquidity, expenses, surplus and, by extension, on the ability of an organisation to build financial reserves (Ryan and Irvine, 2012). It is therefore an important component in assessing universities' financial health, with the caution that "long-term borrowing should be reserved for expanding the organization's ability to increase its revenues" (Bowman, 2007). There is general acknowledgement that the greater the dependence on interest-bearing debt, the more financially vulnerable an organisation is (Booth *et al.*, 2017).

To date, Australian universities have had low levels of interest-bearing debt (Lacy *et al.*, 2017). Evidence from other jurisdictions suggests that the withdrawal of government funding from public universities will precipitate an increase in universities' borrowing (OECD, 2015; Grant Thornton, 2016). Reflecting on the global trend for governments to cut funding to public universities, the vice chancellor of a prestigious Australian university recently stated that while fees from overseas students could be used to fund operations, universities will increasingly need to fund expansion by borrowing, moving towards "little government income, total reliance on fees, highly geared" institutions (Lacy *et al.*, 2017, p. 49). The resulting interest expense has significant implications for universities' long-term financial health, as it will inevitably reduce operating surpluses. This could potentially jeopardise universities' ability to accumulate the reserves necessary to sustain their operations.

With interest-bearing debt likely to become of increasing importance to the funding strategies of Australian universities in the light of proposals to further decrease government funding, we ask the question:

*RQ3.* What is the debt health of Australian universities?

### 3.4 Liquidity

An issue that has had little attention in the Australian context is the importance of universities' current and longer-term financial liquidity. The ability to meet financial commitments in the short term indicates a level of financial viability, while the building of reserves is a key indicator of financial resilience, providing an "equity base" essential to

protect an organisation from “financial shocks” (Tuckman and Chang, 1991, p. 448). The accumulation of reserves is vital to ensuring organisations’ ability to fund their mission in the longer term (Booth *et al.*, 2017). Reserves, or funds held to meet contingencies, enhance financial capacity, reduce dependence on uncertain revenue streams and enable organisations to be innovative and strategic (Bowman, 2007). Bowman’s (2011) portrayal of reserves in terms of “months of spending” provides an indicator of how long a NFP organisation would be able to continue to operate if it lost all its revenue and attempted to maintain operations. For universities, unrestricted reserves (those assets not required to be expended on specific items, and available to be deployed without legal restrictions) represent vital financial safety nets, particularly important in uncertain funding environments (Booth *et al.*, 2017; Ross, 2017).

Publicly funded Australian universities, as NFP organisations, are subject to the same dilemma as other NFPs regarding reserves: they need to build reserves as a buffer against uncertainty, and yet are constrained by public opinion that if reserves are too high, they will be perceived as being cash-rich and not needing funding (Booth *et al.*, 2017). Despite this dilemma of perceptions of wealth, however, with the necessity for universities to reduce their reliance on government funding by developing diversified revenue streams, endowments and the building of reserves are likely to become more material to many Australian universities.

With liquidity an important indicator of financial health, we ask the question:

*RQ4.* What is the liquidity health of Australian universities?

### 3.5 Financial sustainability

Financial sustainability involves more than simply avoiding financial vulnerability or even achieving financial viability in the short term (Bowman, 2011). In a NFP setting, financial sustainability is necessary if an organisation is to be operationally sustainable, i.e. to have the ability to continue to deliver on its mission (Weerawardena *et al.*, 2010; Bolivar *et al.*, 2018). We interpret financial sustainability as an indicator of financial resilience, affecting an organisation’s ability to weather changes and manage the challenges of its external environment. The concept of financial sustainability draws together issues around revenue and expenses, and the existence (or not) of a surplus, which affects an organisation’s ability to accumulate reserves and manage debt (Ryan and Irvine, 2012). In fact, contrary to popular misconceptions that NFP organisations, including universities, should not be earning profits (or surpluses), these are necessary in order to ensure financial and operational sustainability.

Concerns about the financial state of English universities are mirrored in Australia (Morgan, 2015; The Senate, 2017). Opinions about the Australian HES’s ongoing financial viability vary, with media reports highlighting the losses reported by some Australian universities, their consequent inability to absorb funding cutbacks and concerns raised by universities’ vice chancellors about possible fee deregulation (Hare, 2017a). Various recommendations have been made to ensure the sector’s financial sustainability, including changes to the student loan programme (Lacy *et al.*, 2017) and financial incentives for universities regarding student outcomes (Productivity Commission, 2017).

Given the importance of financial sustainability to the ongoing financial health of Australian universities, we ask the following question:

*RQ5.* How financially sustainable are Australian universities?

## 4. Method

The objective of this paper, already identified, is to assess the financial health of the Australian university sector. We mobilise our objective by addressing the five RQs developed above. We do this longitudinally by analysing a set of financial metrics over a

seven-year period, for all 39 Australian publicly funded universities for the calendar years 2009–2015. The ratios we use to calculate these metrics are listed and defined in Table AI. They are based on those identified by Ryan and Irvine (2012), adjusted for university-specific items, and follow the classification of financial statement items presented in the Financial reports of higher education providers (Australian Government, 2010, 2011, 2012, 2013, 2014a, 2015, 2016a).

These financial reports are our primary empirical data. Produced annually by the Commonwealth Government, they bring together the financial statements of all 39 publicly funded Australian universities[5]. Because all universities are required to submit their accounts in this regulated and detailed format, they are (mostly) highly comparable, with one exception: reserves and restricted funds.

We found disparities in the treatment of restricted funds across universities, due, we suggest, to a lack of clarity and consistency between the definitions and the line items included in the financial statement guidelines (see e.g. Australian Government, 2014b)[6]. Our definition of reserves aligns with that of the ACNC (2016), which defines charity reserves as “unrestricted funds that are available to a charity to spend at its discretion”, and excludes tangible assets (including buildings, equipment and land) and restricted funds. Because our definition of reserves also excludes restricted reserves (see Table AI, *RQ4*), we supplemented the annual Financial reports of higher education providers with additional data about universities’ restricted reserves, including endowments. To do this, we accessed and examined the annual/financial reports of 38 of the 39 universities over the seven-year period, a total of 267 report years[7].

In relation to data analysis, we confronted the issue of how best to obtain an overview of the financial view of the sector. Australian universities can be categorised in various ways, such as by state, age or size (de Zilwa, 2005; Marginson and Considine, 2000)[8], or affiliation (Australian Education Network, 2017)[9]. In a UK study, universities were divided into four quartiles, according to their revenue, and distinctions between these groups highlighted (Grant Thornton, 2016). The UK’s Higher Education Funding Council of England posited that future financial uncertainty will likely produce “continued volatility and growing variability in the financial performance of institutions, together with a widening gap between the lowest and highest performing institutions” (Morgan, 2015). We follow this approach by comparing university financial metrics by the size of the university, measured by revenue. We focus on the top and bottom quartiles (the Top 10 and Bottom 10 Australian universities). If there is a change in the financial health of the Australian HES, we believe it will manifest most markedly in the difference between the top and bottom quartiles of the population.

We analysed the financial data by inputting it into a multi-worksheet Excel spreadsheet. Using a detailed set of instructions developed and cross-checked by the researchers, research assistants then applied formulae for the calculation of the financial ratios identified in Table AI and the results of our analysis included in Table AII. This provided the opportunity to compare ratios for all five indicators, for all universities across the seven-year period, and thereby to calculate financial metrics across the entire sector. In addition to these calculations, we used a statistical analysis package to determine whether there were any statistically significant differences between the Top 10 and Bottom 10, first, for individual ratios in every year, and second, for the average ratios for the two groups over the seven-year period[10].

This analysis, we believe, provides a window into the financial health of the sector.

## 5. Findings

In order to assess the financial health of the Australian university sector, in this section we analyse financial metrics for the 39 publicly funded universities over the period 2009–2015, produced by applying the ratios identified in Table AI. We draw on the metrics presented in Table AII.



5.1 Revenue

Overall, total revenue for the sector from 2009 to 2015 increased by 39.8 per cent, from \$20.47bn to \$28.61bn. In large measure, these increases mirror the growth in the sector globally (British Council, 2012). Figure 2 portrays the increases between 2009 and 2015, in each of the nine categories we identify for the purposes of calculating revenue concentration ratios (see Table AI, RQ1).

A clearer understanding of the sources of revenue and changes over the period can be seen by examining the revenue ratios, which show the proportional reliance on each revenue source across the sector (see Table AII, Panel A: revenue ratios). There was a reduction in the percentage reliance on government financial assistance revenue (47.5 per cent in 2009; 43.9 per cent in 2015). This was slightly less than the proportion cited by Lacy *et al.* (2017), of about half, and consistent with Bokor (2012). Countering this, over the period, there was an increase in the proportion of revenue earned from domestic students, paid by the government through student loans (15.1 per cent in 2009; 19.5 per cent in 2015), reflecting the introduction of the demand-driven system. The slight increase in the proportion of revenue earned from overseas students, royalties and other revenue indicates the limited success of the sector in diversifying revenue sources in the face of government funding cutbacks[11].

A comparison of the revenue ratios for the Top 10 and Bottom 10 universities reveals statistically significant differences between the two groups for seven of the nine revenue categories, when analysed over the seven-year period (see Table AII, Panel A: revenue ratios). Over the period of the study, reliance on government assistance revenue was higher in the Bottom 10 (53.3 to 48.4 per cent) than the Top 10 (46.1 to 40.5 per cent), with both categories displaying a reduced reliance over time, and a statistically significance lower reliance over the seven-year period by Top 10 universities. In relation to domestic student revenue, the Bottom 10 (16.9 to 19.1 per cent) had a statistically significantly higher reliance than the Top 10 (10.9 to 15.4 per cent) over the seven-year average, and both categories displayed an increased reliance on this source of revenue over time. Over the period of the study, overseas students contributed a statistically significantly greater share of revenue for the Top 10 (18.7 to 23.1 per cent) than the Bottom 10 (13.1 to 16.1 per cent). When averaged over the period of the study, the Top 10 universities were shown to be statistically

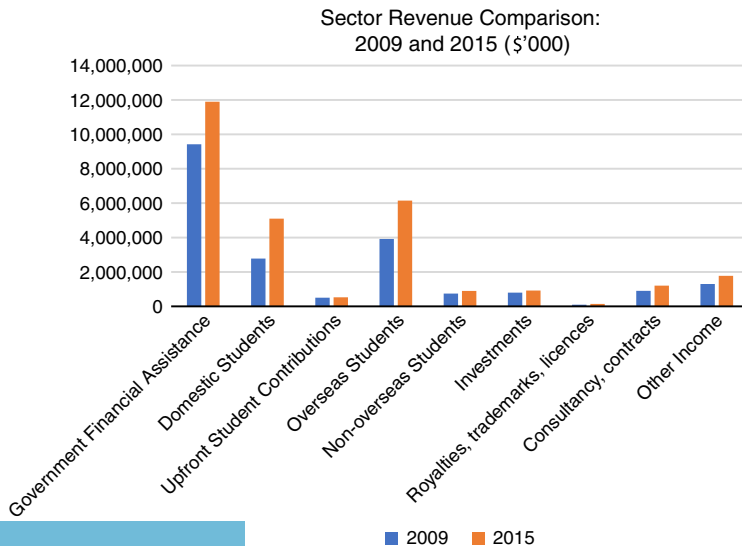


Figure 2.  
Sector revenue  
comparison

significantly more successful in earning revenue from sources such as investments, royalties, consultancies and other revenue. This is consistent with Carnoy *et al.* (2014), and it indicates potential for further revenue diversification.

Revenue concentration is an indicator of financial vulnerability (Tuckman and Chang, 1991; Greenlee and Trussel, 2000; Ryan and Irvine, 2012). The data indicate that despite increases in total revenue, any cutbacks in government funding, given the limited revenue diversity across the sector, could render some universities financially vulnerable.

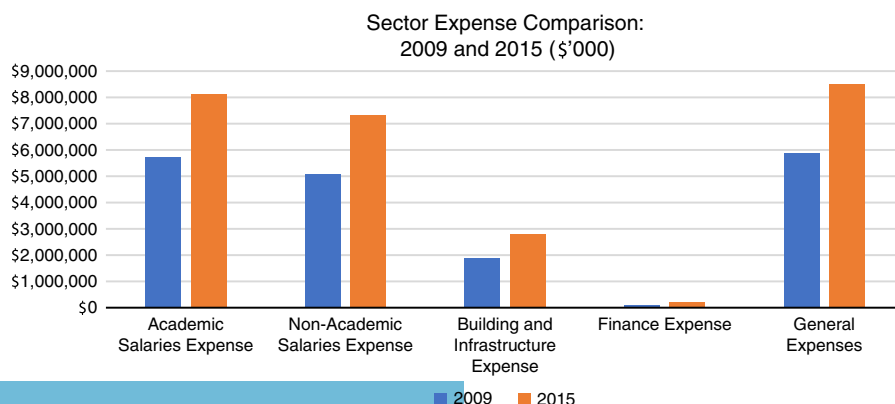
### 5.2 Expenses

Overall, sector expenditure increased from \$18.66bn in 2009 to \$26.96bn in 2015, an increase of 44.5 per cent, exceeding the 39.8 per cent increase in revenue[12]. We analyse five expense categories (see Table AI, RQ2). Sector-wide, there has been a percentage increase in all of these expenditure categories (see Figure 3). This is consistent with the increase in total expenses, with finance expenses increasing by 94.3 per cent, but off a low base. This reflects the increase in the sector’s interest-bearing debt, discussed further below.

The largest expense was employee benefits (combined academic and non-academic salaries expenses), which in 2015 represented 57.3 per cent of total expenditure[13]. In the controversial area of comparative expenses for academic and non-academic employee benefits (Norton and Cakitaki, 2016; Productivity Commission, 2017; Creighton, 2018), our analysis showed that from 2009 to 2015, academic employee benefits expense increased by 42.2 per cent, less than the 44.7 per cent increase in non-academic employee benefits expense.

Sector-wide, there was little observable change in the proportions of total expenditure between 2009 and 2015 (see Table AII, Panel B: expense ratios). Despite government and media attention on the controversial issues of academic and non-academic salaries (Norton and Cakitaki, 2016; Productivity Commission, 2017; Creighton, 2018), highlighted above, an analysis of the changes over time across all universities in the sector revealed the proportion of expenses incurred on academic and non-academic employee benefits by Top 10 and Bottom 10 universities has changed little. However, the performance of individual universities may attract attention on this issue, given that in 2015 the ranges for these ratios were quite wide (26 to 39.2 per cent for academic salaries expense ratio and 20.6 to 35.6 per cent for non-academic salaries expense ratio).

Over the period of the study, the sector mean for general expense ratio accounted for almost one-third of total expenses, with a range in 2015 of 23.9 to 41.2 per cent. This is a non-transparent category, with the nature of the majority of items included unclear. Hidden within this category are marketing expenses, reported in the Australian HES to amount to as much as \$1.7bn over the last seven years (Robinson, 2018; Clarke, 2018). In considering



**Figure 3.** Sector expense comparison

the size of non-academic salaries expense, and the administrative component of general expenses, it is worth noting the observation of Greenlee and Trussel (2000). They stated that if organisations have low discretionary administration costs, they may be more financially vulnerable, because they have less opportunity to cut back on expenditure in the event of a financial shock. Faced with funding uncertainties, some universities may already have begun to cut back on these expenses in order to enhance their viability.

A comparison of the expense ratios for the Top 10 and Bottom 10 reveals statistically significant differences between the two groups for four of the five categories, when analysed over the seven-year period (see Table AII, Panel B: expense ratios). Based on a seven-year average, Bottom 10 universities expended a significantly greater proportion of their total expenses on academic employee benefits, non-academic employee benefits and financial expense, but less on building and infrastructure expense than the Top 10.

In summary, balancing revenue and expenses, it is clear that sector-wide, expenses rose at a greater rate (44.5 per cent) than revenue (39.8 per cent) over the years 2009–2015. Despite the identification of an average surplus across the HES of 6.1 per cent (The Senate, 2017), our analysis revealed a fall in the net operating result across the sector of 8.8 per cent, with five universities moving into deficit by 2015. There was a wide disparity between the final results of the Top 10 and Bottom 10 universities, with the net operating result of the Top 10 increasing marginally (0.6 per cent) over the period, but the Bottom 10 decreasing dramatically (49 per cent). Top 10 universities' share of the sector's net operating result increased from 46.4 per cent in 2009 to 51.1 per cent in 2015. The Bottom 10 universities, in contrast, lost share of the total sector result, from 8.1 per cent in 2009 to 4 per cent in 2015. Research suggests that organisations that earn a high surplus are more financially healthy, having a buffer before they need to cut back on service delivery (Ashley and Faulk, 2010). The divergence between the surpluses (or losses) of Top 10 and Bottom 10 universities therefore indicates vulnerability for some universities.

### 5.3 Debt

We examined the percentage of assets funded by interest-bearing debt, and the capability of universities to cover interest expenses out of their operating surpluses (see Table AI, RQ3). Interest-bearing debt increased by 144.2 per cent over the period from \$1.6bn to \$3.9bn. Not only was more interest-bearing debt reported across the sector, but more universities reported interest-bearing debt in 2015 (30) than in 2009 (27). However, despite this increase, interest-bearing debt was a relatively small, but growing, proportion of total debt (14.2 per cent in 2009 and 19.7 per cent in 2015).

The Top 10 and Bottom 10 universities increased their interest-bearing debt over the period by 115.2 and 32.5 per cent, respectively. Despite these increases, both groups experienced a marked decline in their share of the sector's total interest-bearing debt (the Top 10 universities' share of the sector's interest-bearing debt decreased from 60.6 to 53.4 per cent, while the Bottom 10's decreased from 8.3 to 4.5 per cent)[14]. The decline in debt for the bottom quartile is consistent with UK research, which identifies an increase in interest-bearing debt across all quartiles except the bottom quartile (Grant Thornton, 2016). In the Australian context, it suggests a relatively higher increase in the growth of interest-bearing debt of those universities outside these two groups.

There was an increase, sector-wide, in interest-bearing debt to total assets (see Table AII, Panel C: debt ratios). In 2009, the Top 10 universities demonstrated less reliance on interest-bearing debt to finance their assets, than the Bottom 10 universities. Over the period this situation was reversed, as the Top 10's ratios for interest-bearing debt/total assets ratios increased, while those of the Bottom 10 decreased. Thus, while, when averaged over the seven-year study, the Bottom 10 universities demonstrated a statistically significantly higher reliance on interest-bearing debt (6.3 per cent) than the Top 10 universities (4.7 per cent), the trend is in the opposite direction, as portrayed in Figure 4.

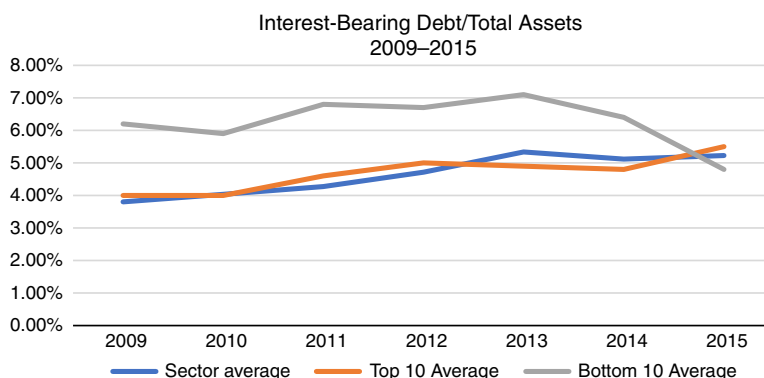


Figure 4. Interest-bearing debt/total assets

The interest coverage ratio is a good indicator of universities' financial health in the short term, measuring the number of times an organisation can service its interest expenses with the earnings it has available. The interest coverage ratios for the Top 10 and Bottom 10 decreased substantially over the period, although the differences between the two groups were not significant (see Table AII, Panel C: debt ratios). For the Top 10 this reflects a combination of increased interest-bearing debt and stagnating net operating results, while for the Bottom 10, despite decreased interest-bearing debt, there has been a substantial decrease in net operating results. As indicated in Table AII (Panel C: debt ratios, Interest coverage), the sector ranges for this ratio over the seven years were large. In 2015, for example, the range was 25.5 times to 206.1 times. This can be explained by 2 universities making losses that year and producing negative ratios; 5 having no finance costs, and therefore having ratios of 0; with the remaining 32 ranging from 1.6 times to 206.1 times. In business terms, ratios of 2.5 or less indicate cause for concern, but there were only four in this bracket. Our analysis reveals that the sector overall is able to manage the increase in its interest-bearing debt, with most universities viable in terms of being able to cover their interest commitments.

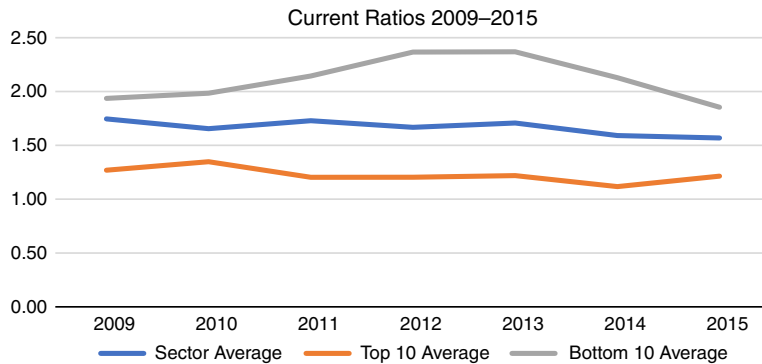
The increase in universities' indebtedness is consistent with global trends (Morgan, 2015; Grant Thornton, 2016), and developments in the Australian HES (Lacy *et al.*, 2017), and reflects universities' growing infrastructure needs, coupled with anticipated cutbacks to government funding (Bracci *et al.*, 2015). This trend could continue in Australia with the current freeze on government funding to the sector (Creighton, 2018). As a whole, the sector is financially healthy in terms of debt, and there is a latent capacity for most universities to increase their levels of debt to service their needs and remain viable, and even, in some cases, resilient.

#### 5.4 Liquidity

We analyse the liquidity, or financial capacity, of Australian universities by analysing their current ratios and reserves ratios (see Table AI, RQ4 and Table AII, Panel D: liquidity ratios). These ratios measure universities' ability to meet their short-term (current ratio) and longer-term (reserves ratio) financial needs. They can also be viewed as indicators of universities' ability to manage their resources and respond to sector disruptions, in order to ensure their ongoing financial viability and resilience.

Over the seven-year period, there was only a slight variation in the average current ratio for the sector as a whole (see Figure 5), with a decrease in the sector mean, from 1.75 in 2009 to 1.57 in 2015. However, as evident in Table AII (Panel D: liquidity ratios), and also as portrayed in Figure 5, a comparison of the current ratios of the two groups of universities by revenue revealed that averaged over the seven years, the Top 10 universities had statistically significant lower current ratios over the period (1.2), than the Bottom 10 (2.1).

Figure 5.  
Current ratios



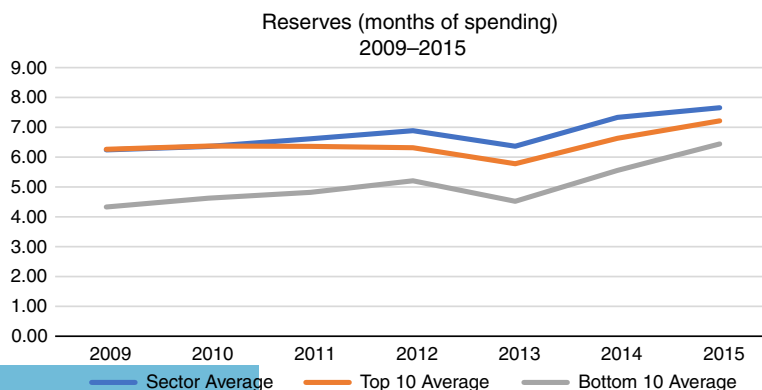
These differences are consistent with Ryan and Irvine (2012, p. 186), who found that in the case of Australian NGOs, larger organisations had lower current ratios, possibly indicating “a greater sophistication and understanding of cash management issues”.

Reserves have been identified as an important indicator of “financial stability and long-term sustainability” for charities (ACNC, 2016). We hold the same to be true for NFP publicly funded universities. Greenlee and Trussel (2000, p. 200) noted that “inadequate equity balances” (reserves) are an indicator of financial vulnerability. It is therefore interesting to note that the reserves (months of spending) ratio (see Figure 6) reflected a different pattern to the current ratio, with the sector mean increasing from 6.2 months in 2009 to 7.7 months in 2015.

Since the level of reserves is unique to individual organisations (ACNC, 2016), there is little in the way of objective guidelines about what constitutes a desirable level, with the notable exception of the US Nonprofit Operating Reserves Initiative, which recommended a minimum of three months of annual spending in reserves for NFP organisations (NORI Workgroup, 2009). The Australian HES exceeded this level comfortably (see Figure 6, Sector Average). The Top 10 universities’ mean also exceeded the three months recommendation, carrying a greater number of reserves (6.3 in 2009, increasing to 7.2 in 2015), as did the mean of the Bottom 10 (4.3 in 2009, increasing to 6.4 in 2015). Our analysis showed a statistically significant difference between the higher level of reserves held by the Top 10 than the Bottom 10 universities, based on seven-year averages.

While Australian universities’ current ratios decreased over the period, they still indicate financial viability. In addition, increasing reserves indicate an extended capacity of charities

Figure 6.  
Reserves



to continue operations, as they build a buffer against unforeseen circumstances or possible decreases in revenue (Booth *et al.*, 2017; Ross, 2017). The same, we believe, applies to Australia’s publicly funded universities.

### 5.5 Financial sustainability

We calculate two profitability ratios that are frequently used to assess the financial sustainability of NFP organisations (see Table AI, RQ5 and Table AII, Panel E: financial sustainability). They are applicable to Australian universities, which are identified as public sector NFPs (Productivity Commission, 2010). The first, surplus margin, measures the rate at which an organisation is capable of building reserves from revenue. It can generally be interpreted as an indicator of managerial efficiency and financial health, particularly regarding vulnerability to a financial shock (Greenlee and Trussel, 2000). Unsurprisingly, since, as already identified, surpluses decreased over the period of the study, the sector’s average surplus margin decreased from 6.5 per cent in 2009 to 4.9 per cent in 2015 (see Figure 7, Sector Average). Despite this decrease, Australian universities generally have higher surpluses than universities in the UK (Grant Thornton, 2016, p. 24), and according to Larkins and Marshman (2016), this has been the case for a decade.

Second, the average return on assets for the sector, which measures the rate of return on the assets under universities’ control, decreased from 3.3 per cent in 2009 to 2.2 per cent in 2015 (see Figure 7, Sector Average). Bowman (2011) contended that in order to survive over the longer term, NFP organisations’ return on assets should at least equal the rate of inflation, which in Australia in 2015 averaged 1.5 per cent. While the sector mean exceeded this inflation rate, our calculations indicate that in 2015, 12 of the 39 universities did not achieve this result. These results have implications for universities with large, established, historic buildings they need to maintain and adapt for current student needs, since in 2015, Australian universities’ property, plant and equipment represented 62 per cent of their total assets (and 67 per cent in 2009). These metrics reinforce the question about whether Australian universities should be using their assets more efficiently, either “as security to increase borrowings or through asset disposal, to generate revenue and improve productivity and profitability” (Marshman and Larkins, 2016, p. 3).

Also of interest is a comparison of these ratios between the Top 10 and Bottom 10 universities. While none of the differences between the two groups were statistically significant for either ratio, in individual years, or averaged for the seven-year period, both revealed a trend towards a widening disparity between the two groups. As shown in Figure 7, surplus margins displayed a relatively slight difference between the two groups in 2009

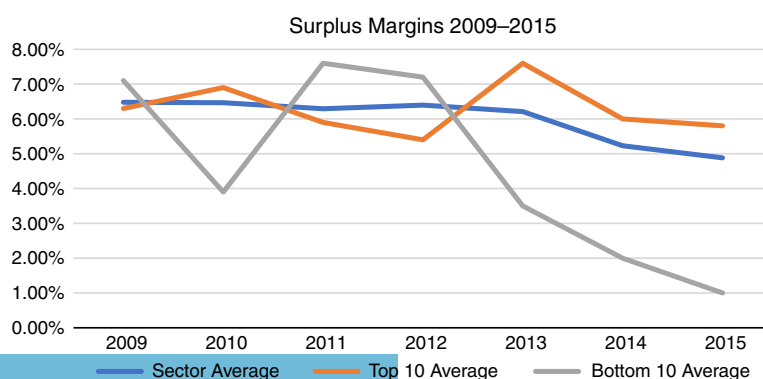


Figure 7. Surplus margins

(6.3 per cent for the Top 10 and 7.1 per cent for the Bottom 10), but by 2015 this difference had been reversed and widened (5.8 per cent for the Top 10 and 1.0 per cent for the Bottom 10).

A similar reversal occurred between the return on assets for the Top 10 and Bottom 10 universities over the period of the study (see Figure 8). In 2009, the average returns were 2.9 and 5.1 per cent for the Top 10 and Bottom 10 universities, respectively, while by 2015 the Top 10's average return on assets of 2.3 per cent was lower than in 2009, but in excess of the average return of 0.5 per cent for the Bottom 10 universities. One of the Top 10 and six of the Bottom 10 universities produced a return on assets of less than the Australian inflation rate (1.5 per cent) in 2015. This indicates financial vulnerability, and the importance of leaner, more efficient operations regarding new building acquisition and the use or disposal of existing buildings, particularly vital in a digital age.

As already indicated, from 2009 to 2015, the revenue of Australian universities increased by 39.8 per cent; however, their demonstrated capacity to use these funds efficiently and generate reserves to ensure longer-term sustainability has decreased. Overall, both the average surplus margin and return on assets decreased over the period. The reason for this can be explained by the fact that, as already highlighted, the increase in total expenses over the seven years outstripped the increase in revenues. Our understanding of this situation is expanded when we compare the financial results of the Top 10 and Bottom 10 universities, with the relative performance of these two groups reversing by 2015 to show the Top 10 outperforming the Bottom 10 and the disparity between these two groups widening.

5.6 An assessment of the financial health of the Australian university sector

The overall objective of this paper has been to assess the financial health of the Australian university sector. To achieve this, we analysed universities' financial data to produce a suite of financial metrics that address our five research questions, as outlined in Section 3 above. We present a summary of our findings in Table I.

Despite increases in the revenues of the HES over the seven years of the study, universities' success in diversifying revenue has been fledgling at best. Overall, the university sector is viable in terms of revenue, but will become vulnerable if attempts to diversify revenue are not successful. The sector's expense growth has outstripped revenue growth, reducing profitability. Expenses, in particular general expenses, are characterised by a lack of transparency, with scope for greater efficiencies. While currently financially viable, the sector is vulnerable in terms of expenses, given current expense levels and trends. The sector's debt has increased, but remains relatively small, with scope for increased borrowing by the wealthier universities. At current levels, debt and interest expenses are realistic. Overall, the university sector is viable in terms of debt, with some universities capable of being financially resilient or achieving financial resilience in the future. There is evidence of increasing

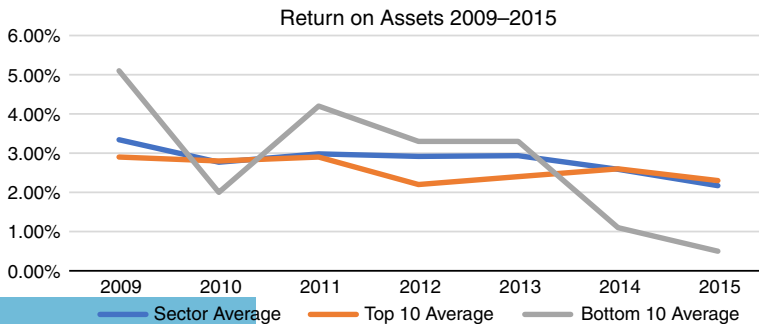


Figure 8.  
Return on assets

Financial health indicator	Sector-wide movement in metrics over 7 years	Financial health trends over 7 years	Financial health assessment
<i>RQ1. What is the revenue health of Australian universities?</i>			
Revenue	Decreases in government assistance, investment and consulting revenue ratios	Despite increase in total revenue, the sector is struggling to achieve revenue diversity	Viability
<i>RQ2. What is the expense health of Australian universities?</i>			
Expenses	Stability in academic and non-academic salaries expense ratios	Increasing at a faster rate than revenue; lack of transparency in expenditure patterns	Viability/Vulnerability
<i>RQ3. What is the debt health of Australian universities?</i>			
Debt	Increase in interest-bearing debt relative to total assets; decrease in coverage of interest expense	Funding of capacity by increase in debt; decrease in capacity to service debt relative to surplus but most universities have debt capacity	Viability/Resilience
<i>RQ4. What is the liquidity health of Australian universities?</i>			
Liquidity	Decrease in current ratio; increase in reserves	Ability to service current cash requirements has decreased slightly but is still adequate; building of reserves is evident	Viability
<i>RQ5. How financially sustainable are Australian universities?</i>			
Financial sustainability	Decrease in surplus margin and return on assets	Demonstrated decrease in profitability	Viability/Vulnerability

**Table I.**  
A summary of the financial health of Australian universities

long-term liquidity with universities' building of reserves, although ability to meet short-term financial needs has decreased. This indicates an improvement in the financial management of the sector. Overall, the university sector is viable regarding liquidity. Indicators of financial sustainability are not encouraging, with profitability showing a downward trajectory. This poses challenges for the future management of the significant assets of the sector, and for the achievement of operational surpluses. Overall, while currently viable, the university sector shows signs of vulnerability regarding financial sustainability.

The sector-wide picture presented by our analysis is that while, on the whole, the Australian university sector is financially viable, some universities are showing distinct signs of financial vulnerability, particularly those within the Bottom 10 category. In contrast, the larger universities, with greater potential for revenue diversification, expense efficiency, increased debt and the ability to build reserves, are more likely to attain financial sustainability and consequently, resilience, in the face of government funding uncertainty.

These findings have implications for government, universities and stakeholders. The development of government HES funding policy needs to be principled, and informed by sector metrics; universities need to manage their operations and develop their capacity to achieve and maintain financial resilience; and societal stakeholders need to be informed about and respond to higher education policies and the means by which they are funded.

## 6. Discussion and conclusion

A traditional view of the public funding of the HES is that it sits between the state and society (Brunner, 1993), demonstrating a partnership between these two groups. Universities provide public benefits (Lewis and Pendlebury, 2002; Edgar, 2017), including the development of a better educated population to meet national economic and social priorities and spearhead research advances, and private benefits for graduates, with



improved employment and earnings potential (Brunner, 1993; Norton and Cakitaki, 2016). An alternate view of university funding identifies the significant private benefits of the sector (Perna, 2003), with the logical implication of this being that the cost should be the responsibility of the individual rather than the state.

Recently, this alternate view has gained credence, with implications for governments that justify decreased expenditure of public funds, particularly in times of budgetary restraint and repair. This view requires the HES to assist in activating national development goals (Walsh and Loxley, 2015) and to bear budget austerity measures (Neu *et al.*, 2008; Bracci *et al.*, 2015). Consequently, higher education, being recognised as providing both public and private benefits, is required to be funded by government and individuals in a politically determined proportion (Brunner, 1993; Marginson, 2013; Edgar, 2017). While the political nature of the development of HES policy is inevitable, we advocate a process that is grounded on a firm principled base, informed by a practical understanding of universities' financial health in order that their public benefits are not eroded. We observe that many who advocate for either increased or decreased public funding for the HES seem to be swayed by often shallow, political and non-evidential-based arguments advanced on either side of the debate. We, however, assert that instead, they should grasp and mobilise the philosophical underpinnings of their respective positions, be open to the injection of financial realities into the debate and be willing to consider the financial, economic and social implications of all policies.

We hold this view, because the major funding debate about the Australian HES has centred around establishing an appropriate public/private funding mix, with the result that the debate has become a political and pragmatic one rather than a principled one. Various funding options have been proposed (Productivity Commission, 2017), including the Australian Government's recent decision to freeze funding to the sector (Creighton, 2018). In exploring possible funding options, one suggestion is that Australian universities are diverse, and that a "one-size-fits-all" funding approach may not be appropriate (Hughes-Warrington, 2017). This is evident in the notion of an "efficiency dividend" that would result in a disparity of treatment across universities (Lane, 2017b). It is also particularly interesting in the light of global developments, where government responses in BRICS jurisdictions (Brazil, Russia, India, China and South Africa) have resulted in an "increasing differentiation between the financing of 'elite and non-elite institutions'" (Carnoy *et al.*, 2014, p. 359).

Solutions such as this should be taken only after a robust debate that considers the principles of higher education, and the unique characteristics of the Australian context. Against the backdrop of the financial analysis outlined in this paper, both sides of the political spectrum, in formulating principled funding policies, need to address the hard questions engendered by alternate views. For those who advocate for current or increased levels of public funding, salient issues are those surrounding universities' efficiency, the appropriate allocation of resources, cross-subsidisation across courses and between research and teaching, and the likelihood, with greater access to a university education, that educational levels may be compromised. Maintaining government funding levels should not negate the possibilities offered by alternate funding sources, including debt. Expenditure patterns need to be considered, particularly in light of criticisms of the sector regarding marketing expenditure, the balance between academic and non-academic employment benefits, and general operational inefficiencies. Also, despite government funding, given the vagaries of successive governments and their funding policies, attention should be paid to building reserves and maintaining financially sustainable operations. These matters need to be considered alongside national economic issues and calls for cutbacks in government spending.

For those who advocate cutting public funding to universities, different issues need to be confronted. These include the possibility that with reduced funding some universities will become financially vulnerable, and may be forced to close or merge, cut back on student services or decrease staff-student ratios. The question that needs to be considered is

whether cutbacks in public funding would seriously affect the sector's capacity to offer equity of opportunity to all, which would be particularly applicable to indigenous and regional students who may otherwise miss out on a university education. It could also be argued that an excessive focus on marketing in the current competitive market, financial efficiency and developing alternate revenue sources, such as fees from international students, could have implications on academic standards, and increased financial vulnerability that will likely lead to cutbacks of services and lower staff-student ratios. We strongly urge universities to attend to the financial metrics underlying their operations, but always to keep these in balance with their mission of educating Australia's population.

With increased competition in the Australian HES precipitating greater expenditure and focus on marketing, promotions, and the duplication of buildings and courses, it may be time for Australia and other western democracies to rethink their HES priorities. Internationally, the challenge may be to really consider the allocation of resources provided to their respective HESs, as pressing global issues such as climate change, environmental degradation, food shortages, poverty and human trafficking assume even greater importance.

By providing empirical evidence of the financial health of the Australian HES, this paper addresses the need for robust financial analysis about universities' capacity to provide ongoing higher education that will enhance societal and economic development. Although "[m]anagerialism in Australian universities has diverted the dominant discourse from pedagogy to financial viability" (Christensen, 2004, p. 485), few academic studies have explored the issue of financial health by relying on empirical data about the finances of Australian universities and their capacity to adapt to changing government funding policy. This paper therefore contributes to the academic literature by analysing financial metrics important to determining universities' financial resilience, and by highlighting the implications for higher education funding policy. Further, by providing empirical data on the financial health of universities, we contribute to informed public debate on the "poorly understood" issue of higher education (Hare, 2015a). In the Australian context, the challenge is to balance the higher education needs of Australian society against the financial realities that dictate the need for budgetary repair.

This study is subject to several limitations. First, it is sector-wide, not focussing primarily on individual universities, but rather on two groups, Top 10 and Bottom 10 universities. In highlighting these, we have neglected the middle quartiles of the university population, except to the extent that we focus on sector-wide financial data and ratios' sector means. This approach is based on our understanding that any evidence of financial vulnerability will most likely be evident in those universities which have the least revenue, and further, that those universities with the highest revenue are the most likely to be leading the sector in adapting to the changing financial environment (Grant Thornton, 2016; Hughes-Warrington, 2017). Second, because of the nature of this study, it has been difficult to compare the financial metrics with other jurisdictions. One exception is the UK, which has a higher education system similar to, but more mature than, the Australian system. Third, our data, based on government reports, supplemented by the financial reports of individual universities, uncovered some inconsistencies in reporting. We have addressed these on a case by case basis. Fourth, our focus on five sets of financial ratios necessarily limits our considerations to these specific areas.

These limitations point to some potentially fruitful avenues for future research. A more detailed comparison of all four quartiles of the Australian university population could provide additional insights, as could more detailed statistical analysis of sector financial data, or an in-depth study of individual universities' financial health. As identified by Cohen *et al.* (2015) and Ahrens and Ferry (2015), there are significant implications of governments' austerity programmes. Universities have increasingly been attempting to diversify their revenue sources by increasing their reliance on revenue from overseas students

(Parker, 2012). This points to some “negative consequences”, as identified by the NSW Independent Commission Against Corruption (Hare, 2015b). Further investigation of universities’ financial reliance on this revenue source, one of the country’s largest export industries (Parker and Guthrie, 2010), could be linked to its impact on academic quality (Creighton, 2018). The extent of cross-subsidisation of research from teaching revenues is not evident from the government’s annual reports of universities’ finances (Ratnatunga and Waldmann, 2010; Knott, 2015), and nor is the issue of cross-subsidisation across courses (Lewis and Pendlebury, 2002; Guthrie and Parker, 2014). With Australian universities reported as earning as much as \$3.2bn a year more from student revenues than is spent on delivering teaching (Knott, 2015), this is a controversial and important yet under-researched issue. At a sector level, the sustainability of the government’s current student loan programme is a related and significant issue, with arguably “inadequate strategic oversight” of the scheme’s financial viability (Warburton, 2016). To date, there has been no link between student debt and universities’ operations (Productivity Commission, 2017). Overall policy studies would be valuable, in particular an examination of the relationship between VET and universities being crucial (Mackenzie, 2018).

With Australia’s aspiration to increase the proportion of its population having a university degree, universities are key to the formation of skills needed to ensure economic growth and stability. Consistent with Parker *et al.* (2018, p. 1), we see the need for the development of policy at a “system level”, by developing a principles-based policy framework, based on robust empirical data. This would provide certainty for stakeholders and maximise the public benefits of university education. To this end, the university sector faces challenges in balancing its educative mission with the building of financial resilience.

#### Notes

1. The Australian HES has become a “significant export industry” over the last 20 years (Norton and Cakitaki, 2016, p. 41), with universities being a major contributor to the country’s record education export earnings of \$21.8bn in 2016, the third highest after iron ore and coal (Universities Australia, 2017). In 2015, Australian universities reported total revenue of over \$28.6bn (Australian Government, 2016a, p. 16).
2. The Higher Education Contribution Scheme (HECS) and its successor, the Higher Education Loan Program (HELP), have enabled Australian undergraduate students to meet the cost of their university education with government loans. Similar programmes exist for the Vocational Education Sector (VET). The names have changed as different policies have been activated over the years.
3. It was estimated that in 2014 the value of “new knowledge and technologies” to the Australian economy was \$160bn, a return of \$5 to \$10 on “every dollar invested in university research” (Edgar, 2017).
4. Historically, Australian universities have not been very successful in attracting industry funding (Rowlands and Blackmore, 2018).
5. These are comprised of an Income Statement, Statement of Other Comprehensive Income, Statement of Financial Position, Statement of Changes in Equity, Statement of Cash Flows and Notes for the Acquittal of Australian Government Financial Assistance (Australian Government, 2014b). They are produced in accordance with the requirements of the Higher Education Support Act 2003, the Australian Research Council Act 2001, the Corporations Act 2001 and Australian standards and authoritative pronouncements of the Australian Accounting Standards Board (AASB), in the format required of Higher Education Provides (HEPs) by the Australian Government Minister for Education (Australian Government, 2014b).
6. In the guidelines for the presentation of financial reports by HEPs, restricted funds are defined generally as “funds that have been contributed to the institution by external parties but do not meet the requirements for recognition as revenue and do not meet the requirements for recognition

as a liability. Statutory funds where restrictions or conditions mandated by Act or subordinate legislation restrict the use of those funds are restricted funds” (Australian Government, 2014b, p. 7). Statutory funds are therefore one category of restricted funds. In consequence of this definition, the detailed guidelines for the presentation of information in universities’ Statements of Financial Position divide equity into three categories: restricted funds, reserves and retained earnings (Australian Government, 2014b). However, in the detailed reports submitted by HEPs to the government, the categories for equity are statutory funds, reserves and retained surplus (see e.g. Australian Government, 2015). This provides no category for endowments, some of which may be restricted, and which may be of significance especially for older-established universities, such as those in the prestigious Group of 8 (Go8, or Sandstone universities). The guidelines acknowledge that the HEP reports represent adjustments to the universities’ published reports.

7. Most of these were publicly available, but we were unable to access the annual reports of Notre Dame University.
8. Five categories that have been identified are: Sandstones (by age), Redbricks (the post-Second World War universities), Gumtrees (universities founded between 1960 and 1975), Unitechs (former Colleges of Advanced Education, with strong links to industry and practice) and New Universities (founded after 1986).
9. These are the Go8, the Australian Technology Network (ATN), Regional Universities Network (RUN), Intensive Research Universities (IRU) and Non/Affiliated. There has recently been movement in these categories.
10. There was little movement in the Top 10 and Bottom 10 universities by revenue over the period of the study. Of the Top 10, 9 were constant, and included 7 of the G08 (ANU, Melbourne, NSW, Sydney, Queensland, Monash, UWA), with two from the ATN (RMIT and QUT). Four other universities moved in and out of that group (Curtin three times, Griffith twice, Adelaide once, Deakin once). Of the Bottom 10, 8 were constant (Canberra, Southern Cross, New England, Batchelor, Charles Darwin, USC, Federation, Notre Dame), with 4 other universities moving in and out of that group (USQ six times, CQU three times, Murdoch twice, ACU three times). Significantly, most of these universities are regional, some with an indigenous focus.
11. Some US elite universities receive more than half their income from philanthropy (Moodie, 2012). This has been identified as an area where universities’ revenue streams could be diversified and increased, and many Australian universities have embarked on such programmes in the last decade (Collins and Hurst, 2013). However, smaller universities are at a disadvantage as they do not have access to the large number of bequests available to older and more established universities.
12. This is a greater increase than the 21.4 per cent increase in total operating expenses of the UK HES over the same period (Grant Thornton, 2016).
13. This compares with a UK study, which showed an equivalent proportion of total employee costs to total expenses of 56.7 per cent (Grant Thornton, 2016).
14. Over the period, the number of Top 10 universities with interest-bearing debt was constant at 8, while the number of Bottom 10 universities with interest-bearing debt increased from 5 to 7.

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### Further reading

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Appendix 1

Ratios	Calculations	Indications
<i>RQ1. What is the revenue health of Australian universities? Revenue ratios<sup>a</sup></i>		
Government financial assistance revenue ratio	$\frac{\text{Australian government grants + state and local government financial assistance revenue}}{\text{total revenue}}$	Government revenue as % of total revenue
Domestic student revenue ratio	$\frac{\text{HECS-HELP+FEE-HELP+VET-FEE-HELP+SA-HELP}}{\text{Total revenue}}$	Domestic student revenue (through student loans from government) as % of total revenue
Upfront student contributions revenue ratio	$\frac{\text{Upfront student contributions}}{\text{Total revenue}}$	Domestic student upfront payments as % of total revenue
Overseas student revenue ratio	$\frac{\text{International student revenue (UG and PG)}}{\text{Total revenue}}$	Overseas student revenue as % of total revenue <sup>b</sup>
Full-fee student (non-overseas) revenue ratio	$\frac{\text{Course fees and charges (non-overseas)}}{\text{Total revenue}}$	Full-fee paying non-overseas student revenue (UG and PG) as % of total revenue <sup>c</sup>
Investment revenue ratio	$\frac{\text{Investment revenue}}{\text{Total revenue}}$	Investment revenue as % of total revenue
Royalties, trademarks and licence revenue ratio	$\frac{\text{Royalties, trademarks and licences revenue}}{\text{total revenue}}$	Royalties and related revenue as % of total revenue
Consultancy and contracts revenue ratio	$\frac{\text{Consultancy and contracts revenue}}{\text{Total revenue}}$	Consultancy and contracts revenue as % of total revenue
Other revenue ratio	$\frac{\text{Other revenue}}{\text{Total revenue}}$	Other revenue as % of total revenue
<i>RQ2. What is the expense health of Australian universities? Expense ratios<sup>d</sup></i>		
Academic employee benefits expense ratio	$\frac{\text{Academic Employee benefits expense}}{\text{Total expenses}}$	Academic benefits as % of total expenses <sup>e</sup>
Non-academic employee benefits expense ratio	$\frac{\text{Non-Academic employee benefits expense}}{\text{Total expenses}}$	Non-academic benefits as % of total expenses <sup>f</sup>
Building and infrastructure expense ratio	$\frac{\text{Depreciation and amortisation expense + repairs and maintenance expense + impairment of assets}}{\text{Total expenses}}$	Building and infrastructure expenses as % of total expenses
Financial expense ratio	$\frac{\text{Finance costs + investment losses}}{\text{Total expenses}}$	Financial expenses as % of total expenses
General expense ratio	$\frac{\text{General expenses (Other expenses)}}{\text{Total expenses}}$	General expenses as % of total expenses <sup>g</sup>
<i>RQ3. What is the debt health of Australian universities? Debt ratios</i>		
Interest-bearing debt to total assets	$\frac{\text{Total interest-bearing debt}}{\text{Total assets}}$	% of assets funded by interest-bearing debt
Interest coverage	$\frac{\text{Income before interest and taxes}}{\text{interest expense}}$	Number of times interest expense is covered by income (before interest and taxes)

(continued)

Table AI. Financial ratios

Table AI.

Ratios	Calculations	Indications
<p><i>RQ4. What is the liquidity health of Australian universities? Liquidity ratios</i> Current ratio</p>	<p>Current assets/Current liabilities (includes unexpended funds)</p>	<p>Number of times current liabilities are covered by current assets (ability to meet financial commitments in the short term)</p>
<p>Operating reserves (months of spending)</p>	<p>(Financial assets – restricted reserves) – (current + non-current borrowings)/Average monthly expenses net of depreciation</p>	<p>Number of months of cash expense requirements currently available</p>
<p><i>RQ5. How financially sustainable are Australian universities? Financial sustainability ratios</i> Surplus margin</p>	<p>(Total revenue net of capital grants – Total expenses)/Total revenues net of capital grants</p>	<p>% return on revenues</p>
<p>Return on assets</p>	<p>Total revenue – Total expenses/Total assets</p>	<p>% return on assets</p>
<p><b>Notes:</b> <sup>a</sup>These ratios cover all eight revenue categories, therefore add up to 1; <sup>b</sup>includes apportionment of other fees and charges in ratio of overseas student income to non-overseas student income; <sup>c</sup>includes apportionment of other fees and charges in ratio of non-overseas student income to overseas student income; <sup>d</sup>these ratios cover all five expense categories, therefore add up to 1; <sup>e</sup>includes apportionment of deferred superannuation expense to academic employee benefits in ratio of academic to non-academic superannuation expense; <sup>f</sup>includes apportionment of deferred superannuation expense to non-academic employee benefits in ratio of non-academic to academic superannuation expense; <sup>g</sup>financial reports identify scholarships, grants and prizes; non-capitalised equipment; advertising, marketing and promotional expenses and other expenses. More detailed information is available in individual universities' Notes to the Accounts</p>		

	2009	2010	2011	2012	2013	2014	2015	7-year average
<i>Panel A: revenue ratios (RQ1)</i>								
Government financial assistance revenue ratio								
Sector mean	0.4749	0.4747	0.4757	0.4844	0.4611	0.4485	0.4388	0.4654
Sector range	0.2837–0.9044	0.2803–0.8965	0.2882–0.9253	0.2854–0.7791	0.2996–0.7606	0.2850–0.8024	0.3038–0.8358	n/a
Top 10 mean	0.4610	0.4660	0.4560	0.4670	0.4480	0.4220	0.4050	0.4464
Bottom 10 mean	0.5330	0.5450	0.5480	0.5550	0.5300	0.5050	0.4840	0.5286
<i>p</i> -Value	0.233	0.180	0.177	0.098	0.043	0.157	0.160	0.000**
Higher but not statistically significant results for Bottom 10 every year; statistically significant difference between 7-year averages								
Domestic student revenue ratio								
Sector mean	0.1515	0.1570	0.1564	0.1624	0.1861	0.1906	0.1945	0.1712
Sector range	0.0274–0.3334	0.0271–0.3142	0.0076–0.3028	0.0000–0.3220	0.0000–0.3400	0.0000–0.3549	0.0000–0.3621	
Top 10 mean	0.1090	0.1170	0.1110	0.1210	0.1320	0.1440	0.1540	0.1269
Bottom 10 mean	0.1690	0.1820	0.1770	0.1700	0.1930	0.1910	0.1910	0.1819
<i>p</i> -Value	0.077	0.070	0.046	0.191	0.063	0.191	0.366	0.000**
Higher but not statistically significant results for Bottom 10 every year; statistically significant difference between 7-year averages								
Upright student contributions revenue ratio								
Sector mean	0.0255	0.0251	0.0265	0.0235	0.0225	0.0204	0.0213	0.0236
Sector range	0.0001–0.0465	0.0003–0.0428	0.0001–0.0426	0.0000–0.0400	0.0000–0.0393	0.0000–0.0339	0.0000–0.0294	n/a
Top 10 mean	0.0220	0.0210	0.0320	0.0220	0.0210	0.0220	0.0300	0.0243
Bottom 10 mean	0.0260	0.0260	0.0250	0.0230	0.0220	0.0200	0.0170	0.0227
<i>p</i> -Value	0.479	0.413	0.519	0.832	0.823	0.678	0.318	0.542
Little observable difference between the two groups in each year except 2015; no statistically significant difference in the individual years or the 7-year average								
Overseas student revenue ratio								
Sector mean	0.1809	0.1848	0.1824	0.1721	0.1707	0.1776	0.1908	0.1799
Sector range	0.0000–0.4386	0.0000–0.4688	0.0000–0.3976	0.0000–0.3414	0.0000–0.3519	0.0000–0.3882	0.0000–0.3984	n/a
Top 10 mean	0.1870	0.1990	0.2060	0.1960	0.1990	0.2110	0.2310	0.2041
Bottom 10 mean	0.1310	0.1280	0.1270	0.1350	0.1290	0.1390	0.1610	0.1357
<i>p</i> -Value	0.168	0.054	0.097	0.137	0.112	0.069	0.059	0.000**
Lower but not statistically significant results for Bottom 10 every year; statistically significant difference between 7-year averages								
Full-fee student revenue (non-overseas) revenue ratio								
Sector mean	0.0362	0.0326	0.0312	0.0309	0.0305	0.0313	0.0320	0.0321
Sector range	0.0035–0.1044	0.0000–0.1091	0.0037–0.1044	0.0038–0.1091	0.0054–0.1067	0.0050–0.0981	0.0000–0.1035	n/a
Top 10 mean	0.0330	0.0310	0.0310	0.0320	0.0280	0.0290	0.0300	0.0306

(continued)

Table AII.  
Financial metrics

Table AII.

	2009	2010	2011	2012	2013	2014	2015	7-year average
Bottom 10 mean	0.0380	0.0290	0.0300	0.0260	0.0280	0.0330	0.0370	0.0316
<i>p</i> -Value	0.440	0.790	0.882	0.415	1.000	0.682	0.539	0.582
Little observable difference, and no statistically significant difference between the two groups in single years or 7-year averages								
Investment revenue ratio								
Sector mean	0.0317	0.0298	0.0311	0.0301	0.0305	0.0278	0.0262	0.0296
Sector range	0.0013-0.0997	0.0012-0.0910	0.0019-0.1052	0.0010-0.0796	(0.0052)-0.0967	0.0005-0.1169	0.0018-0.1442	n/a
Top 10 mean	0.0500	0.0450	0.0430	0.0460	0.0470	0.0520	0.0420	0.0464
Bottom 10 mean	0.0250	0.0250	0.0250	0.0180	0.0180	0.0180	0.0150	0.0206
<i>p</i> -Value	0.002**	0.085	0.048*	0.028*	0.019*	0.011*	0.066	0.000**
Statistically significant higher result by Top 10 in five of the seven years, and in the 7-year average								
Royalties, trademarks and licence revenue ratio								
Sector mean	0.0035	0.0033	0.0030	0.0025	0.0028	0.0033	0.0038	0.0032
Sector range	0.0000-0.0488	0.0000-0.0433	0.0000-0.0369	(0.0002)-0.0289	0.0000-0.0308	0.0000-0.0438	0.0000-0.0511	n/a
Top 10 mean	0.0070	0.0020	0.0060	0.0010	0.0030	0.0050	0.0050	0.0041
Bottom 10 mean	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<i>p</i> -Value	0.191	0.168	0.168	0.343	0.081	0.244	0.096	0.002*
Observable but not significantly higher results for Top 10 in all years; statistically significant difference between 7-year averages								
Consultancy and contracts revenue ratio								
Sector mean	0.0401	0.0364	0.0387	0.0399	0.0394	0.0384	0.0373	0.0386
Sector range	0.0001-0.1014	0.0000-0.0950	0.0000-0.1082	0.0000-0.1528	0.0000-0.1775	0.0007-0.1169	0.0008-0.0998	n/a
Top 10 mean	0.0490	0.0420	0.0470	0.0450	0.0430	0.0460	0.0470	0.0456
Bottom 10 mean	0.0240	0.0200	0.0260	0.0340	0.0360	0.0310	0.0280	0.0284
<i>p</i> -Value	0.010**	0.028*	0.101	0.504	0.681	0.343	0.179	0.000**
Observable differences in each year and statistically significant differences in 2009 and 2010; statistically significant lower results by Bottom 10 based on 7-year averages								
Other revenue ratio								
Sector mean	0.0556	0.0558	0.0572	0.0534	0.0559	0.0621	0.0574	0.0568
Sector range	0.0037-0.1266	0.0090-0.1406	0.0068-0.1363	0.0051-0.1950	0.0073-0.1897	0.0128-0.2960	0.0097-0.1715	n/a
Top 10 mean	0.0770	0.0720	0.0780	0.0690	0.0800	0.0670	0.0680	0.0730
Bottom 10 mean	0.0480	0.0460	0.0410	0.0380	0.0440	0.0640	0.0560	0.0481
<i>p</i> -Value	0.114	0.140	0.015*	0.041*	0.115	0.860	0.524	0.002**

(continued)

	2009	2010	2011	2012	2013	2014	2015	7-year average
Lower reporting by the Bottom 10 was statistically significant in 2011 and 2012, and also based on 7-year averages								
<i>Panel B: expense ratios (RQ2)</i>								
Academic employee benefits expense ratio								
Sector mean	0.3050	0.3105	0.3128	0.3150	0.3112	0.3102	0.3057	0.3100
Sector range	0.1819–0.3853	0.1974–0.3791	0.2164–0.3858	0.2366–0.3946	0.2622–0.3867	0.2579–0.3882	0.2601–0.3918	n/a
Top 10 mean	0.3070	0.3060	0.3060	0.3080	0.3050	0.3030	0.2990	0.3049
Bottom 10 mean	0.3070	0.3160	0.3200	0.3070	0.3090	0.3060	0.3060	0.3101
<i>p</i> -Value	1.000	0.453	0.346	0.930	0.799	0.824	0.515	0.041*
Little observable difference between the two groups; statistically significant higher ratio for Bottom 10 based on 7-year average								
Non-academic employee benefits expense ratio								
Sector mean	0.2768	0.2779	0.2780	0.2790	0.2802	0.2809	0.2788	0.2788
Sector range	0.2176–0.3532	0.2128–0.3333	0.2168–0.3447	0.2196–0.3484	0.2207–0.3666	0.2281–0.3530	0.2061–0.3564	n/a
Top 10 mean	0.2690	0.2740	0.2710	0.2780	0.2700	0.2700	0.2680	0.2714
Bottom 10 mean	0.2810	0.2820	0.2850	0.2820	0.2840	0.2830	0.2830	0.2829
<i>p</i> -Value	0.317	0.587	0.246	0.754	0.445	0.439	0.343	0.000**
Little observable difference between the two groups; statistically significant higher ratio for Bottom 10 based on 7-year average								
Building and infrastructure expense ratio								
Sector mean	0.0965	0.0943	0.0941	0.0933	0.0941	0.0934	0.0990	0.0949
Sector range	0.0519–0.1540	0.0474–0.1533	0.0460–0.1416	0.0487–0.1675	0.0475–0.1408	0.0469–0.1387	0.0494–0.1595	n/a
Top 10 mean	0.1020	0.1030	0.1050	0.0980	0.1060	0.0970	0.1110	0.1031
Bottom 10 mean	0.0810	0.0780	0.0780	0.0770	0.0790	0.0820	0.0880	0.0804
<i>p</i> -Value	0.054	0.030*	0.014*	0.008**	0.031*	0.076	0.078	0.000**
Observably higher ratio for Top 10 universities; statistically significant difference in four years and based on 7-year average								
Financial expense ratio								
Sector mean	0.0064	0.0062	0.0102	0.0072	0.0072	0.0081	0.0071	0.0075
Sector range	0.0000–0.0629	0.0000–0.0542	0.0000–0.0741	0.0000–0.0552	0.0000–0.0499	0.0000–0.0428	0.0000–0.0373	n/a
Top 10 mean	0.0040	0.0060	0.0110	0.0070	0.0080	0.0090	0.0070	0.0074
Bottom 10 mean	0.0090	0.0070	0.0140	0.0080	0.0080	0.0110	0.0070	0.0091
<i>p</i> -Value	0.495	0.832	0.718	0.868	1.000	0.705	1.000	0.045*

(continued)

Table AII.

	2009	2010	2011	2012	2013	2014	2015	7-year average
Small, erratic and observable, but not statistically significant differences between the two groups in each year; statistically significant higher result for Bottom 10 based on 7-year averages								
General expense ratio								
Sector mean	0.3154	0.3113	0.3050	0.3056	0.3073	0.3072	0.3083	0.3087
Sector range	0.2394–0.4994	0.2451–0.4948	0.2482–0.4768	0.2123–0.4461	0.2422–0.4110	0.2344–0.4061	0.2392–0.4121	n/a
Top 10 mean	0.3190	0.3130	0.3060	0.3090	0.3150	0.3210	0.3130	0.3137
Bottom 10 mean	0.3230	0.3160	0.3060	0.3270	0.3200	0.3120	0.3190	0.3171
<i>p</i> -Value	0.821	0.893	0.829	0.251	0.751	0.404	0.752	0.251
Little observable difference between the two groups either in individual years or based on 7-year averages								
<i>Panel C: debt ratios (RQ3)</i>								
Interest-bearing debt to total assets								
Sector mean	0.0380	0.0403	0.0427	0.0472	0.0534	0.0512	0.0540	0.0464
Sector range	0.0000–0.4939	0.0000–0.4615	0.0000–0.4293	0.0000–0.4304	0.0000–0.3918	0.0000–0.3540	0.0000–0.3192	n/a
Top 10 mean	0.0400	0.0400	0.0460	0.0500	0.0490	0.0480	0.0550	0.0469
Bottom 10 mean	0.0620	0.0590	0.0680	0.0670	0.0710	0.0640	0.0480	0.0627
<i>p</i> -Value	0.684	0.694	0.634	0.691	0.615	0.663	0.848	0.007**
Observable but not statistically significant higher results by Bottom 10 every year except 2015; statistically significant difference based on 7-year averages								
Interest coverage <sup>a</sup>								
Sector mean	25.2376	15.6335	11.9166	12.4104	12.1667	8.6316	9.4937	13.6414
Sector range	0.0000–399.8484	(251.6400)–513.1049	(149.5200)–1,391.3636	(117.4423)–6,475.4286	(12.3087)–13,029.0000	0.0000–676.0631	(25,4719)–206.0645	n/a
Top 10 mean	36.8722	37.7920	12.9600	18.6310	15.6130	8.8367	7.4444	19.7356
Bottom 10 mean	28.0600	14.2563	6.5700	11.1914	11.9350	11.3870	5.7625	32.6404
<i>p</i> -Value	0.725	0.241	0.312	0.025	0.380	0.917	0.497	0.066

Top 10 covered interest expense more comfortably each year except 2014; no statistically significant differences  
<sup>a</sup>Because there was such a huge disparity between universities for this ratio, we statistically identified the upper and lower boundaries of the population for each year, and then eliminated outliers in the calculation of means. In the sector ranges, where there is a ratio of 0.0000, this indicates that no finance costs were incurred; a negative ratio indicates an operating loss was made

(continued)

	2009	2010	2011	2012	2013	2014	2015	7-year average
<i>Panel D: liquidity ratios (RQ4)</i>								
Current ratio	1.7454	1.6546	1.7287	1.6673	1.7075	1.5907	1.5684	1.6661
Sector mean	0.4360–4.6932	0.4158–3.4868	0.3043–5.2191	0.3511–5.3271	0.3499–5.0247	0.3443–3.5591	0.4233–3.9574	n/a
Top 10 mean	1.2690	1.3480	1.2030	1.2040	1.2190	1.1170	1.2140	1.2249
Bottom 10 mean	1.9360	1.9840	2.1440	2.3660	2.3690	2.1280	1.8540	2.1116
p-Value	0.182	0.287	0.079	0.062	0.093	0.063	0.197	0.000**
Higher, but not statistically significant, results for Bottom 10 every year; statistically significant difference based on 7-year averages								
Reserves								
Sector mean	6.2419	6.3586	6.6152	6.8860	6.3638	7.3307	7.6543	6.7786
Sector range	(9.9634)–14.7266	(9.3496)–13.4868	(8.0367)–17.2416	(8.2046)–19.6929	(6.6342)–17.9698	(4.8125)–18.8464	(3.3991)–20.8734	n/a
Top 10 mean	6.2630	6.3710	6.3610	6.3150	5.7770	6.6320	7.2160	6.4193
Bottom 10 mean	4.3300	4.6250	4.8210	5.2080	4.5200	5.5550	6.4410	5.0714
p-Value	0.411	0.452	0.558	0.760	0.710	0.696	0.745	0.000**
Higher but not statistically significant results for Top 10 every year; statistically significant higher result based on 7-year averages								
<i>Panel E: financial sustainability ratios (RQ5)</i>								
Surplus margin	0.0648	0.0647	0.0629	0.0640	0.0621	0.0523	0.0488	0.0599
Sector range	(0.0428)–0.2126	(0.1416)–0.1507	(0.0145)–0.1795	(0.0982)–0.2296	(0.0727)–0.1521	(0.0468)–0.3021	(0.0868)–0.2208	n/a
Top 10 mean	0.0630	0.0690	0.0590	0.0540	0.0760	0.0600	0.0580	0.0627
Bottom 10 mean	0.0710	0.0690	0.0760	0.0720	0.0350	0.0200	0.0100	0.0461
p-Value	0.750	0.257	0.240	0.611	0.076	0.050*	0.112	0.312
Erratic differences each year, Top 10 results statistically significantly higher in 2012								
Return on assets								
Sector mean	0.0334	0.0277	0.0298	0.0292	0.0294	0.0259	0.0217	0.0281
Sector range	(0.0197)–0.2308	(0.1195)–0.0902	(0.0108)–0.1049	(0.0741)–0.0943	(0.0419)–0.1078	(0.0245)–0.2310	(0.0618)–0.1304	n/a
Top 10 mean	0.0290	0.0280	0.0290	0.0220	0.0240	0.0260	0.0230	0.0259
Bottom 10 mean	0.0510	0.0200	0.0420	0.0330	0.0330	0.0110	0.0050	0.0279
p-Value	0.324	0.662	0.057	0.533	0.475	0.216	0.212	0.744
Observable but not statistically significant differences each year, with Top 10 reporting higher results in 2010, 2014 and 2015 and Bottom 10 reporting higher results in 2009, 2011, 2012 and 2013; little observable difference based on 7-year averages								



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