Is there an association between Vice-Chancellors' compensation and external performance measures?

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Abstract:

We provide evidence on the pay for performance relation between Australian university Vice Chancellors compensation and independent measures of university teaching, research and other performance indicators provided by external ranking bodies. Our results show limited association between university rankings and Vice Chancellors' compensation, but confirm that Vice Chancellors' compensation is predominantly driven by size measures based on the different components of revenue. Further, we find that few universities offer performance-based bonus payments. Our results are robust with respect to a number of sensitivity tests.

1. Introduction

Over the last two decades, many countries have introduced performance-related compensation for senior executives of public-sector entities, using the principles of New Public Management (NPM)[1]. The underlying notion for this policy direction is that associating pay with performance leads to more efficient contracting and a better utilisation of public resources (Manning *et al*., 2012). Under NPM principles, Australian universities have become increasingly corporatised, and this has led researchers to examine different aspects of Australian Vice-Chancellors' (VCs') compensation. For example, Soh (2007) compares VCs' compensation with the compensation of chief executive officers (CEOs') in the private sector and finds that during the late 1990s and early 2000s, VCs compensation approximates 50% to 60% of private sector CEOs' compensation. Clements and Izan (2008) provide evidence on universities executive pay for the period 1999 – 2004 and indicate executive compensation has increased at double the rate of teaching and research academics and, is largely based on university size measured by total revenue.

Our study, builds on and extends these prior studies in a number of important ways. First, our sample period of 2005 – 2012 covers the time during which there were a number of important reforms of the university sector (Bradley Review, 2008). These reforms transformed universities from the traditional collegiate model into "corporate universities" and led to an explosion of VCs' compensation. Second, we address the association of VCs' compensation with university performance as measured by external ranking agencies. External rankings provide an objective quantitative measure of university performance, particularly in regards to teaching and research performance which are often highlighted in VC performance assessments in remuneration disclosures (see Appendix B). It is our contention that university rankings are

[1] Hood (1989), "New Public Management" (NPM), resulted in the corporatisation and commercialisation of public sector entities with the objective of enhancing the economic efficiency and effectiveness of the public sector.

an appropriate measure of performance as they are: (i) utilised for advertisements promoting the university, (ii) incorporate performance measures used to justify the levels and changes in VCs' compensation, and (iii) are highlighted in position descriptions and advertising for VC appointments.[2] Whilst prior research has documented an association between VC compensation and university size, it has not examined if VC compensation is linked with external measures of performance. Third, we control for a number of institutional and financial characteristics of universities to determine the key drivers of VCs' compensation. For example, we separate total university revenue into different revenue streams and examine which components are more highly associated with VC remuneration.

Our motivation for this study is twofold. First, a number of prior studies address the determinants of CEO (including university presidents' / VCs') compensation in different not-for-profit sectors (Baber *et al*., 2002; Bai 2014; Brickley and Van Horn 2002; Frumkin and Keating 2010; Sedatole *et al*., 2013).[3] These studies focus on the association between compensation and revenue growth and accounting ratios, and conclude that organisation size, as measured by revenue and its core components, is the main driver of compensation. A major limitation of prior research, is that due to the unavailability of an independent external measure of performance, these studies do not examine if CEO compensation is linked to an organisations' performance in meeting its' key objectives which are non-financial. We overcome this limitation through the use of university rankings provided by external agencies.

[2] Although it is acknowledged that external rankings are an imperfect measure of university performance, rankings are nevertheless used by universities for promotional activities on their website and annual reports, providing university councils a benchmark for advertising and subsequent appointment of VCs, as well as justification for the payment of VC bonuses (see appendix A and B).

[3] For consistency, we use the term CEO in this study to identify the most senior executive in an organisation. We acknowledge that the actual title is likely to differ across not-for-profit sectors and specific entities. These sectors comprise, educational, charitable institutions, hospitals / medical, and law enforcement etc.

Importantly, these rankings assess university performance in meeting both their non-financial (i.e., teaching and research) and operational objectives (i.e., student-staff ratios).

We build on and extend this prior literature by focusing on the pay for performance relation in the Australian not-for-profit university sector. The university sector provides an ideal setting to examine the pay for performance link in the not-for-profit sector, because universities are homogeneous in that they are funded and regulated by the Commonwealth and State Governments respectively.[4] Furthermore, all universities have the same objectives of delivering quality education and research. More importantly, university performance in relation to these two objectives is measured and reported on by independent Australian and international ranking agencies, which universities and their VCs recognise as one of their key performance measures (see Appendices A and B).

Our second motivation is to add to the public policy debate on the appropriateness of the levels and increases in VC compensation. Under NPM philosophy, two fundamental changes took place in the Australian university setting. First, as university places became demand driven and international student intakes increased, the university sector became economically significant. Approximately 60% of university funding is contributed by the Commonwealth Government (Australian Federal Government, Financial Reports of Higher Education Providers 2013), which represents approximately 49% of the Commonwealth Government education budget. Further, the university sector became the fourth largest export industry in Australia (Australian Federal Government Report, November 2014). Second, the commercialisation of the university sector coupled with the deregulation of universities has led to large increases in the levels and growth of VCs' compensation.[5] These large VC remuneration packages have led to societal,

[4] The Australian university setting is distinctly different from the US setting, where there are both public and private universities. Accordingly, we have excluded three small private universities from our sample.

[5] The commercialisation of the University sector based on a user pay student funding system was introduced by the Australian Government in the Dawkins Report (1988) with further commercialisation of the University sector

governmental and media concern, as to whether the pay levels are justified by the quality of education and research provided by universities (Dodd 2014a; Hare 2012; National Tertiary Education Union 2017). For example, Senator Pauline Hanson gave a speech in the Australian Senate reflecting these concerns:

> "*The government, as a matter of urgency, should be conducting a review of the salaries paid to our university vice-chancellors. This group of some 38 men and women are excessively paid. They are on average the highest paid vice-chancellors in the world, but their universities are not the highest performing in the world. Sydney University is ranked 60th in the world, but the vice-chancellor of Sydney University receives more than double the pay of the No. 1 university in the world, which is Oxford University*." (Senator Pauline Hansen, Australian Senate, 17 August 2017).

At present, there is limited empirical evidence to inform this public debate, as prior research (Soh, 2007; Clements and Izan, 2008) does not test if VC compensation is linked with the research and teaching performance of universities. This study provides such evidence.

Our evidence is based on hand-collected data comprising 182 observations for 37 universities from 2005 to 2012. Our performance measures are based on rankings provided by three rankings agencies: (i) Hobson's, Good University Guide (GUG), (ii) Quacquarelli Symonds Limited (QS) World University Rankings, and (iii) Shanghai Ranking's - Academic Ranking of World Universities (ARWU). Our descriptive results show VCs' compensation has increased annually at a rate of 12.2%. Further, although there are only 23 VC bonus payments paid by 8 universities, the explicit triggers for these bonus payments are not disclosed. (Refer to Appendices B and D)

introduced by the Bradley Review (Bradley *et al*., 2008). These reviews are aimed at increasing the size of the tertiary education sector whilst reducing government funding.

Our multivariate results shows that there is a limited association between VCs' compensation and external rankings, with only the ARWU ranking being positive and significant. When we break down the ARWU rankings into its core components (See Appendix C), the main drivers of this result are (i) Papers in Science Citation Index (PUB) and (ii) Per capita academic performance (PCP). We also test the association between changes in VCs' compensation with changes in rankings and document that only changes in the GUG and ARWU rankings are significant. Our final test provides evidence on the association between current year VCs' compensation and the previous years' rankings, and it highlights a significant positive association for the ARWU and the QS ranking but only for the ARWU sample. Nevertheless, in all cases, the significant results for university rankings are not robust to the inclusion of alternative size measures based on the components of university revenue. Overall, our findings are consistent with societal concerns that VC remuneration is not justified by the performance of universities in meeting their teaching and research objectives. In contrast, the results suggest that VCs are rewarded for maximising student numbers and increasing revenues which is at odds with universities being a not-for-profit entity. This result is potentially an unintended consequence of the deregulation of university student numbers.

Our results contribute to the pay for performance literature in the not-for-profit sector and provide guidance to policymakers. First, we contribute evidence on the applicability of principal/agency theory in the not-for-profit sector. A number of researchers outline the agency problems in the not-for-profit sector by identifying at least two agency issues (i) the separation of the board and management and (ii) the separation of management and stakeholders (Caers *et al*., 2006; Van Puyvelde *et al*., 2012). We focus on and provide empirical evidence on the first agency problem, being the interaction between the board (university council) and management (VCs), as well as the ability of the board to link pay with performance. A well-functioning university council should reduce agency problems because, as observed by Caers *et al*., (2006,

page 28) when discussing the agency problem in the not-for-profit sector, ‘‘*outcome-based compensation would induce the agent to exert more than the minimum level of effort*.” Our evidence is consistent with the findings of Baber *et al*., (2002), and suggests that VCs’ compensation is mainly associated with the different components of revenue and not associated with a university’s teaching and research performance.

Second, our results contribute to the dilemma faced by policymakers on how to maximise the utilisation of public resources under NPM. Our findings indicate that quantifiable external performance measures aligned with university goals are not associated with VCs’ compensation. These performance measures which are incorporated in ranking outcomes include: research funding, research outcomes and operational performance indicators such as staff/student and international faculty ratios (see Appendix C). Importantly, these measures also represent advertised performance measures for new VC appointments as well as annual achievements stated in annual reports (see Appendix A). Our descriptive results also indicate that VC bonus compensation is relatively infrequent and on average, represents approximately 20% of VCs’ total compensation. This result is inconsistent with the findings of Balsam and Harris (2018), where 45% of a total of 45,000 observations for non-profit organisations paid a bonus to their CEOs. Concern over VCs’ compensation in Australia has led to policy recommendations by minority parties in the Australian federal parliament. For example, Liberal Democrat Senator David Leyonhjelm recommends the formation of an independent remuneration tribunal (Lane, 2017; Graham, 2019). While our results of the limited association between VCs’ compensation and ranking performance measures do not directly address these policy recommendations; they suggest that there is an unresolved agency problem in the Australian university sector.

The rest of this paper is structured as follows. Section 2 presents the literature review, institutional setting, and theory development. Section 3 describes the sample and data and

outlines the research design. Section 4 reports results, while Section 5 details sensitivity and additional tests. Conclusions and suggestions for future research are detailed in Section 6.

2. Literature Review, Institutional Setting and Theory Development

2.1 Literature Review

A number of studies provide evidence on the relation between CEO compensation of not-for-profit entities and accounting-based performance measures. For example, Brickley and Van Horn (2002) examine hospitals, Frumkin and Keating (2010) study five different sectors including education, and Sedatole *et al*., (2013) use a large United States sample of tax-exempt not-for-profit organisations in three sectors (i.e., education, medical, and charities). Generally, these studies find that CEOs' compensation is associated with size as measured by alternative revenue components.

Prior research investigating VCs' and senior executives' compensation in universities has been undertaken in Australia and internationally. Soh (2007) compares the remuneration practices of Australian VCs to CEOs in the private sector between 1995 and 2002 and find VCs' compensation is approximately 56% less than their private sector counterparts after controlling for size. The study also reports that an increase in university size of 10% renders a 2.7% increase in VCs' compensation. Clements and Izan (2008) investigate the remuneration of the top five academic executives between 1999 and 2004 at 33 Australian universities and document that size is the dominant factor in determining remuneration. Furthermore, they find that academic executive remuneration had increased at a rate *"about twice the increase in the salaries of teaching and research academics"* (Clements and Izan 2008: p 28).

In the United Kingdom, the only unregulated salary in the university sector is that of VCs. Baimbridge and Simpson (1996) model the remuneration of VCs utilising 22 institutional and 18 personal explanatory variables for 64 universities between 1993 and 1994. They conclude

"*that many of the key managerial and performance indicators fail to offer any explanation for reward levels*" awarded to VCs (page 637).

US studies find that high stature[6] universities offer greater compensation to their VCs, although notably, the greater compensation is not supported by higher performance (Banker *et al*., 2009; Pfeffer and Ross 1988). Parsons and Reitenga (2014) demonstrate that private university presidents are paid relatively more than their public university peers. Cheng (2014) finds that performance-related variables play a very limited role in determining public university presidents' executive remuneration. Bai (2014) reports similar findings for US private universities. One of the inherent issues associated with these studies is that US private and public universities have different objectives and stakeholders resulting in different performance measures being appropriate. Our study overcomes this potential shortcoming by focusing on the Australian setting, where all universities are publicly funded and have homogeneous objectives, as such we can utilise homogeneous performance measures to analyse whether they impact VCs' compensation.

2.2 Institutional Setting of Australian Universities

Hansmann (1980, page 838) defines a non-profit organisation as "*an organisation that is barred from distributing its net earnings, if any, to individuals who exercise control over it…*"[7] Within the not-for-profit sector, universities in Australia comprise 37 public universities geographically spread across the country. Australian universities are funded by the Commonwealth Government, but they are incorporated and regulated by state government

[6] University stature is based on four measures being the quality of enrolled students, the average salary of professors, tuition fees, and the size of endowments.

[7] Individuals comprise: members, officers, directors or trustees.

legislation.[8] Since the introduction of tuition fees in 1989, referred to as the Higher Education Contribution Scheme (HECS), universities have undergone a process of commercialisation of both, operations and management structures [9].

In 2008, the 'Bradley Review' (Bradley *et al*., 2008) recommended the discontinuation of the quota system and the deregulation of student fees for undergraduate places. These recommendations changed universities to become primarily student-demand-driven due to the sizable revenue streams associated with this action. With the Commonwealth Government's share of funding progressively declining[10] (Dodd, 2014b), universities have filled this gap with full-fee paying domestic students along with increasing numbers of full-fee paying international students. The increases in student numbers combined with increased competition between universities for students have led to the commercialisation of management practice and associated administrative structures (Withers, 2014).

These regulatory changes have transformed universities from the traditional collegiate model into commercial, academic enterprises, managed by 'academic executives' (Clements and Izan 2008). As part of the academic enterprise changes, VCs' compensation, along with other senior executives' compensation, has been deregulated leading to significant increases in both levels and changes in VCs' compensation. For example, the average VCs' compensation between 2005 and 2012 was $670,000 with average annual growth of 12.2% (see Table 3). Whether the levels and increases in VCs' compensation are associated with university performance in meeting their non-financial objectives is an empirical question on which we provide evidence.

[8] Under the Australian Constitution, each state has the legislative jurisdiction over all tiers of education. For example, the University of Sydney Act 1989, is legislation governing all aspects of university operations introduced and amended by the New South Wales Government.

[9] Australian Federal Government (1988) Higher Education Funding Act.

[10] Government funding as a percentage of university income has reduced from 90% in 1981 to approximately 41% in 2012 (Dodd, 2014a).

2.3 Theory Development

The two dominant theoretical frameworks used in the private sector to explain the pay for performance relation are (i) efficient contracting and (ii) capture theory. Efficient contracting draws on agency theory (Jensen and Meckling, 1976), which suggests that on average, CEO contracts are efficient in the reduction of agency costs associated with the separation of ownership and control. In contrast, capture theory, proposed by Bebchuk and Fried (2003, 2005), suggest that the board is captured by the CEO, and hence her/his compensation is not necessarily associated with firm performance.

Researchers have explored the agency problems associated with not-for-profit entities based on the above private sector theories. Further, they have incorporated stakeholder and stewardship theories (Caers *et al*., 2006; Van Puyvelde *et al*., 2012; Sedatole *et al*., 2013). While there is still some theoretical debate amongst these researchers as to what is the best way to explore the agency problem in not-for-profit entities, we adopt the approach of Caers *et al*. (2006), who divide the principal-agent relationship into board-manager and manager-employee (stakeholders) interactions.

Our paper focuses on the board (university council) – manager (Vice Chancellor) relationship, as university councils, approve the compensation of VCs and they are the "*prime defender of the mission statement and as a champion of its achievement*" (Caers *et al*., 2006, p32). Hence, it is the council's role to link university performance to VC compensation consistent with efficient contracting theory. In the university setting, council membership typically comprises: the Chancellor, Vice-Chancellor, chair of the academic board, government-appointed members, council appointed members, as well as elected members representing the academic, administrative, and student bodies of the university. It is arguable whether the council is in a position or has the expertise to develop effective compensation strategies which tie VCs'

compensation to university performance. This situation may be due to the difficulties associated with the measurement of performance, which includes the evaluation of efficiency and effectiveness in the transformation of inputs to output (Free *et al*., 2009). In addition, as council members are typically unpaid, prior research (Adams and Ferreira, 2008) suggests that this reduces the effort that members devote to their role. Finally, the council only meets a limited number of times per year and based on its composition, it typically includes members with limited or no prior business experience.

The existence of external rankings provides university councils with the opportunity to link VC compensation with external measures of performance which align to university teaching and research objectives. VCs themselves for example, often quote rankings and or ranking components to highlight their university's performance (see Appendix A). Moreover, universities often mention performance in teaching and/or research when justifying VC compensation (see Appendix B). All ranking measures have components related to research and teaching quality, faculty members' international reputation, student/staff ratios, international faculty, and international student demand (see Appendix C). Different universities may have dissimilar objectives which are aligned to one or more of the measures produced by external ranking agencies. Hence, councils may use aggregate rankings and/or ranking components as performance targets when setting VC compensation. Alternatively, councils may link pay with good research or teaching performance, which are reflected in the external rankings. Whether university councils utilise these rankings to measure performance in determining VCs' compensation or rely more on qualitative as opposed to quantitative performance measures remains an empirical question. We provide evidence on the association between ranking performance measures and VCs' compensation.[11]

[11] Free *et al*., (2009) highlight the limitations of rankings arising from the lack of auditability of the information provided to ranking agencies.

3. Research design and data

3.1 Sample

The Australian Federal Government 2003 Higher Education Support Act (HESA) reports that there are 43 accredited Higher Education Providers in Australia. Data on Australian universities are hand collected from annual reports for the years 2005 to 2012 inclusive. Annual report data is then matched with university financial statements obtained from the Australian Federal Government's Department of Education, who provide the "Financial Reports of Higher Education Providers" annually. External rankings data is also hand collected from three separate ranking agencies: (i) GUG, (ii) QS and (iii) ARWU. Table 1 describes the sample selection process.

[Insert Table 1 here]

After excluding local specialist, international, and private accredited universities, as well as universities that did not publish annual reports, the final sample comprises 37 universities using the GUG rankings, 25 universities using the QS rankings, and 21 universities using the ARWU rankings. The number of observations is inconsistent across the different ranking metrics, as not all universities participate in all three rankings. The GUG rankings only apply to Australian universities, whereas the ARWU and QS rankings include leading Australian and international universities.

The reporting of VC compensation is inconsistent, with disclosures varying between universities and in many cases on a year-to-year basis for the same university. We assume that VCs receive the highest compensation and exclude observations where VCs' compensation is not reported or is not determinable from remuneration report disclosures. Finally, for

Universities that changed their VCs, the outgoing VC in their final year and the incoming VC in their first year are excluded due to the non-disclosure of termination payments and sign-on bonuses (Baber *et al*., 2002; Coulton and Taylor 2002).[12] After these deletions and excluding missing rankings, the final sample utilising the GUG rankings comprises 182 observations, 131 observations using the QS sample, and 103 observations using the ARWU sample.[13]

3.2 Model Specification

The research design employed to investigate the relation between VCs' compensation and university rankings controls for alternative size measures using revenue components. The model also controls for governance characteristics, institutional complexity and financial measures. Variables are defined in Table 2.

[Insert Table 2 here]

External performance measures are sourced from three independent university ranking agencies being (i) GUG *(LnGUG Rank Score),* (ii) QS *(LnQS Rank Score),* and (iii) ARWU *(LnARWU Rank Score).* Following Sedatole *et al*. (2013), we include the following unique revenue streams of universities as alternative size measures (i) donations and bequests *(LnEndowments),* (ii) government funding, *(LnGovFund),* (iii) research income and grants *(LnResearchIncome),* (iv) domestic full-fee paying student revenue *(LnDomFFRev),* and (v) international student revenue *(LnIntStuRev).* Using disaggregated revenue streams as alternative size measures facilitates the evaluation of the main drivers of VC compensation

[12] It would be inappropriate to include a new VCs' compensation in our analysis as new appointments have not been in the position long enough to impact on performance. Furthermore, retiring VCs usually receive a payout that includes accumulated leave and superannuation entitlements coupled with a termination bonus, which would distort the pay/performance relation.

[13] Not all universities in the analysis have the same number of annual observations. For example, the sample includes two contiguous ranges for the University of Sydney, being the years 2005-2006 and 2009-2012 with 2007 and 2008 excluded due to a departing VC in 2007 and an incoming VC in 2008. Due to this variation in the number of annual observations, the sample comprises an unbalanced panel data set.

(Frumkin and Keating, 2010; Sedatole *et al*., 2013) and extends prior research (Soh, 2007; Izan and Clements, 2008).

We also include a number of control variables in our models. First, the number of council members *(TCouncil)* is included as an institutional governance control. Second, we control for complexity using (i) the number of campuses *(TCampus)*, (ii) the number of Faculties *(TFaculties)* and (iii) the qualifications and experience of the Chancellor (*ChancellorExp*). Finally, financial performance controls are included comprising (i) the ratio of operating expenses to total revenue *(OpExp_R)* (ii) debt to equity *(Debt/Equity)*, and (iii) return on equity *(ROE)* as a relative measure of financial performance. These measures are included despite universities being classified as not-for-profit entities because, in some instances, VCs are compensated for achieving financial objectives (See Appendix B – Macquarie University).

To reduce potential skewness, we use the natural logarithm of VCs' compensation as the dependent variable. In summary, the following unbalanced panel regression model is estimated, both as levels and changes to investigate the drivers of VCs' compensation:

$$LnVCPay_{it} = \alpha_0 + \beta_1\, Performance\ Measures_{it} + \beta_2\, Alternative\ Size\ Measures_{it} + \beta_3 Institutional\ Controls_{it} + \beta_4 Financial\ Controls_{it} + \mathcal{E}_{it} \quad (1)$$

3.3 Descriptive Statistics

Descriptive statistics are reported in Table 3.

[Insert Table 3 here]

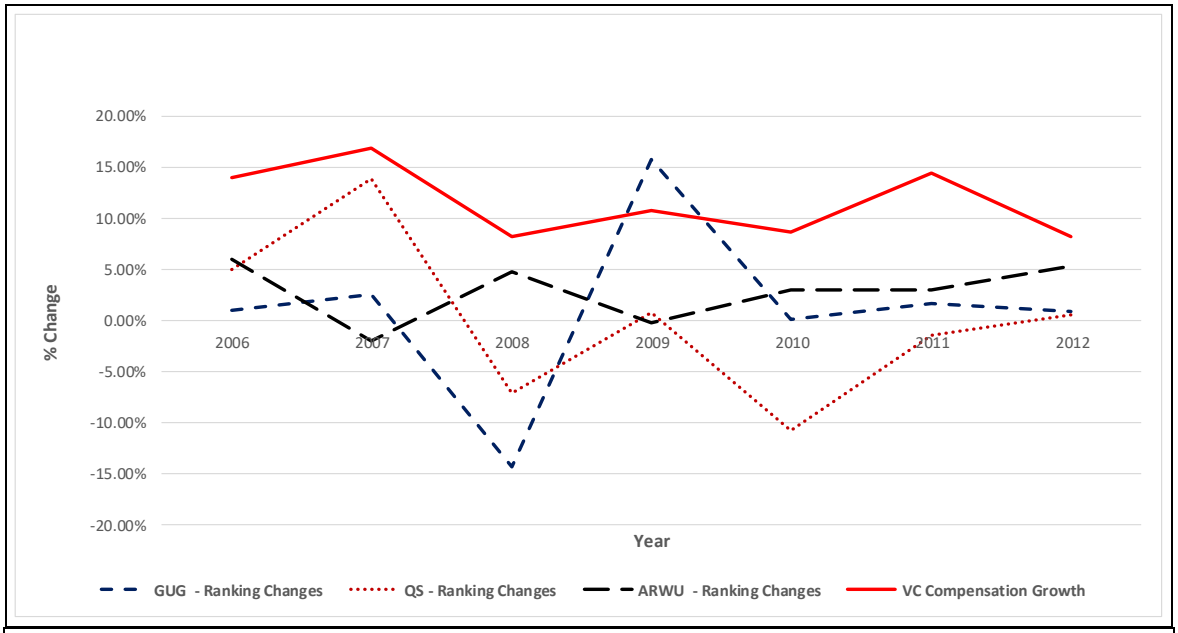
The mean VCs' compensation *(VCPay)* is $670,000 and this result is more than double the mean for 1994-2004 reported by Clements and Izan (2008), thereby suggesting abnormal growth in Australian VCs' compensation. The highest paid VC had a one off annual salary of $1,600,000, and the average annual compensation growth *(Δ%VCPay)* is 12.2% per annum.

Additionally, the mean VC bonus compensation *(Bonus Pay)* is $170,000. It is noteworthy that only a limited number of universities pay a bonus. In Appendix B, we include examples of VCs' compensation descriptions extracted from annual reports. In all cases, the disclosures suggest that bonus payments are based on unspecified financial and non-financial targets.

The external performance measures include rankings published by the Good University Guide *(GUG Rank Score)* with a possible maximum score of 40 (*QS Rank Score* 100, *ARWU Rank Score* 100). The GUG rank score has a mean of 26 (QS 51, ARWU 16) with a maximum of 36 (QS 92, ARWU 31) and a minimum of 12 (QS 14, ARWU 8). The change in the rank scores is reported using an indicator variable (with increases denoted as one and decreases and no movements denoted as 0). Using the GUG sample, the ranking score *(*Δ*Gug Rank Score_iv),* increases in 43.3% of the observations [QS 50.9% *(*Δ*QS Rank Score_iv),* ARWU 60.3% *(*Δ*ARWU Rank Score_iv*)]. Appendix D provides additional summary information classified by each university for average VC compensation, VC compensation growth and participation in the individual ranking measures.

A visual representation of the average changes in VCs' compensation and average change in the three ranking performance measures are shown in Figure 1.

Figure 1 – Average % Change in VCs' Compensation and Average % Change in Rankings



YEAR	2006	2007	2008	2009	2010	2011	2012
GUG - Ranking Changes	0.98%	2.49%	-14.33%	15.72%	0.07%	1.62%	0.85%
QS - Ranking Changes	4.99%	13.82%	-7.11%	0.76%	-10.83%	-1.43%	0.47%
ARWU - Ranking Changes	6.00%	-2.07%	4.75%	-0.27%	2.94%	2.98%	5.34%
VC Compensation Growth	**13.92%**	**16.83%**	**8.23%**	**10.74%**	**8.58%**	**14.46%**	**8.17%**

An examination of Figure 1 suggests that the level of changes in VCs' compensation are independent of changes in the rankings. We provide further statistical evidence on this contention in Section 4.

Alternate size measures include five distinct university revenue streams. The five revenue streams comprise: (i) total endowments with a mean of $6.52 million and average growth of *(%ΔEndow)* 69.61%; (ii) the largest source of revenue is government grants with an average of $340 million and a growth rate *(%ΔGovFund)* of 9%; (iii) research income is on average the third highest source of revenue and averages $51 million and a growth rate *(%ΔResearch Income)* of 4.4%; (iv) domestic full fee paying students revenue averages $35 million with a growth rate *(%ΔDomFFRev)* of 6.5%; and finally (v)revenue from international students averages $94 million with a growth rate *(%ΔIntStuRev)* of 9.8% per annum.

The size of the university council *(TCouncil)*, ranges from eight to 27 members with a mean of 18.79 members. The chancellor in 69.6% of our observations (*ChancellorExp*) are either ex-

government, ex-public servant and/or ex-legal background.[14] University complexity is proxied using the number of campuses *(TCampus),* which ranges from one to 16 with a mean of 4.9 campuses. Of note is that the average number of campuses for the Group of Eight (G8) universities (5.38) exceed that of the non G8 universities (5.07). The number of faculties *(TFaculties)* ranges from two to 17 with an average of 6.49. G8 universities have the highest number of faculties averaging 9.38, with the University of Sydney reporting on average 17 faculties. Amongst the financial controls, operating expenses average 92% of total revenues *(OpExp_R).* Debt levels average at 33% of equity and the average return on equity *(ROE)* is 4.9%.

Pearson and Spearman correlations for the variables used in the regression equations are reported in Table 4.

[Insert Table 4 here]

The Pearson correlation coefficients indicate that VCs' compensation *(LnVCPay)* is only significantly positively correlated with the ARWU rank score (at the 10% level). The Spearman correlations for VC compensation report that two of the three ranking measures being the GUG (at the 10% level) and the ARWU (at the 5% level) are significant. Of the alternative size measures, VCs' compensation is significantly correlated with domestic full-fee paying students *(LnDomFFRev)* and international student revenue *(LnIntStuRev)* both at the 10% level. Further, the three ranking measures are highly correlated with each other as well as four of the five alternative revenue size measures.

4. Results

4.1 Main Results

[14] We also define the *ChancellorExp* variable as one, if the chancellor has prior business experience. The results (not tabulated) are insignificant in all of the analysis.

Table 5 reports the results testing the association between VC compensation and external rankings. The results are reported alternatively using only (i) external performance measures (columns 1- 3); (ii) utilising the ARWU rank sample applied to the GUG and QS rankings to test whether the reduced sample generates a different result (columns 4-5); (iii) the alternative size measures only (column 6), and (iv) utilising simultaneously the alternative ranking and size measures (columns 7 – 9). The dependent variable in each case is the log of VCs' compensation *(lnVCPay).* In all cases, we employ university and year fixed effects (FE) regressions.[15]

[Insert Table 5 here]

The results in Table 5 disclose that the ARWU ranking (column 3) is positive and significantly (1% level) associated with VCs' compensation. Additionally, using the universities with QS rankings within the ARWU sample also returns a significant positive result (column 5). However, these performance measures become insignificant once the alternative size measures are introduced (columns 7, 8 and 9). Therefore, these results do not provide statistically reliable evidence that external performance measures are associated with VCs' compensation. As a sensitivity test (results available on request) when we look at the individual components for each external ranking, we find that for both the ARWU and QS sample that publications and academic reputation respectively, are positively associated with VCs' compensation. However, once again these results are not robust to the inclusion of the alternative size measures.

Amongst the size measures, government funding *(LnGovFund),* domestic full fee students *(LnDomFFRev),* and international student revenues *(LnIntStuRev)* are the main drivers of VCs' compensation. The domestic full fee student revenue *(LnDomFFRev)* measure is significant in all models (columns 6 to 9), while international student revenues *(LnIntStuRev)* are not

[15] The Hausman test is used to determine whether to apply fixed or random effects.

significant for the QS and ARWU samples (columns 8 and 9). The insignificance of endowment revenue *(LnEndowments)* is a departure from US findings (Parsons and Reitenga 2014; Sedatole *et al*., 2013) and is likely driven by lower endowment and alumni revenues in Australia compared with the US.

The results for the institutional and financial control variables are inconsistent across models. University council size *(TCouncil)* and the number of campuses *(TCampus*) show some evidence of a negative association with VC compensation. As discussed above, since G8 universities have more campuses than non-G8 universities, the negative coefficient on the number of campuses is not driven by university status.

Overall, the significant positive results for the alternative size measures confirm the Australian findings in both Soh (2007), and Clements and Izan (2008) that larger universities pay their VCs more. However, our study differs in that it includes both, external performance measures and different revenue sources enabling a more detailed insight into the determinants of VCs' compensation (Frumkin and Keating, 2010; Sedatole *et al*., 2013). Our results indicate that the individual revenue component measures, particular student fee revenue, and not the external performance measures, are the main drivers of VC compensation. Hence, despite the focus of many universities on external rankings (see Appendix A), we cannot find statistically reliable evidence that VCs' compensation is linked to external rankings.

In Table 6, we test the association between changes in VCs' compensation and changes in the external performance measures utilising an indicator variable denoting upward movements in the ranking. The model also includes controls for changes in the individual revenue components. The institutional and financial control variables are identical to those utilised in Table 5. The dependent variable is the percentage change in VC compensation *(%ΔVCPay).* In

all cases, we use university and year fixed effects (FE) regressions with robust standard errors clustered by university and year.

[Insert Table 6 here]

The findings show that only the GUG indicator variable is significant on two occasions, using the full sample and the sub-sample of observations with ARWU rankings (columns 1 and 4). However, upon including the changes in the alternative size measures (columns 6, 7 and 8), the external performance measures lose their significance. Of the alternative size measures, the change in endowments is negatively associated with changes in VC compensation. This result is consistent with Frumkin and Keating (2010) that donors perhaps look adversely on high levels of VC compensation. An alternative interpretation is that VCs are not rewarded with higher pay for obtaining endowments, as these revenue sources are beyond their control. The results also indicate that a one per cent increase in domestic full-fee paying students *(%*Δ*DomFFRev)* results in a 0.19% increase in VC compensation (column 6). Amongst the controls, the number of faculties *(TFaculties)* using the QS and ARWU rankings data (columns 2, 3, 4, 5, 7 and 8) is positive and statistically significant. This is consistent with increased complexity resulting in higher VC compensation. Overall, neither the changes in the external rankings nor the changes in the alternative size measures provide statistically reliable evidence supporting changes in VCs' compensation. A possible explanation is that VC compensation levels are based on qualitative factors, which in many instances are not disclosed.

In Table 7, we provide evidence on the association between the current year VCs' compensation and the ranking performance in the prior year. This test allows us to assess if rankings are linked to the subsequent year's compensation. Control variables remain the same, and all models employ university and year fixed effects (FE) regressions with robust standard errors clustered by university and year.

[Insert Table 7 here]

The results are consistent with the results reported in Table 5 and indicate that only the ARWU (column 3) and QS (columns 5) external performance measures are significant (at the 1% level, but only for the ARWU sub-sample) and positively associated with next years' VCs' compensation. However, in line with our previous tests, the external performance measures are no longer significant once we introduce the alternative size measures.

Of the alternative size measures, the results indicate a significant positive association between VC compensation and revenue from government funding as well as domestic full fee revenue but only for the ARWU sample (column 9). However, VCs' compensation is negatively associated with prior year international student revenue (columns 6 and 9). Overall, there is only weak evidence that the alternative size measures explain the VCs' compensation for the subsequent year.

Of the institutional control variables, total council members *(TCouncil)*, the Chancellor experience indicator variable *(ChancellorExp)* and total faculties *(TFaculties)* are statistically significant. Total faculties on six occasions are negatively associated with next years' VCs' compensation (columns 1 to 5, 9). Total council members *(TCouncil)* on two occasions (columns 1 and 9) are negatively associated with next years' VCs' compensation. The Chancellor experience indicator variable on four (4) occasions has a significant positive association with next years' VCs' compensation, however, this only applies to universities included in the ARWU sample. One plausible explanation for this finding is that Chancellors with governmental or legal background have limited experience in determining VCs' compensation and consequently they are more likely to utilise external consultants to benchmark VCs compensation (Nugent 2015).

The financial control variables do not provide statistically consistent results. On two occasions (columns 6 and 7) the operating expense ratio (*OpExp_R*) is negative and significant, which is to be expected. The debt/equity ratio on three occasions (columns 2, 8 and 9) are positive and significant indicating that the current year's debt funding is associated with next years' VCs' compensation.

In summary, our key findings are as follows. We do not find statistically reliable evidence that VCs' compensation is associated with university performance as measured by external rankings. While some of our tests indicate a positive association between levels and changes in VCs' compensation and university rankings, these results are sensitive to controlling for the alternative size measures.

4.2 Discussion of Findings

Under NPM, the intention is to link senior executive compensation to performance in not-for-profit entities. Our evidence tests this expected pay for performance relation within the Australian university setting utilising rankings as an external performance measure. We utilise rankings as a performance measure as they provide an independent quantitative measure of the university's performance in its core business operations comprising teaching and research. Our results indicate that the levels and changes in VCs' compensation are not statistically associated with external rankings. Recent descriptive evidence also supports these main findings. For example, Monash University's ARWU country position in the ARWU rankings went from 78 in 2017 to 91 in 2018, yet the VC's compensation increased from $995,000 in 2017 to $1,105,000 in 2018. Similarly, the QS ranking for the University of Sydney's went down from 46 to 50 yet the VC's compensation increased from $1,477,500 in 2017 to $1,522,500 in 2018. There are at least three plausible explanations for the findings in this study, (i) rankings are a poor measure of universities' performance, or (ii) university councils lack the motivation,

expertise and experience to link VCs' compensation to external quantifiable measures, or (iii) VC's can 'capture' their councils and receive compensation which is not tied to performance. Based on our evidence, we cannot discriminate between these three alternative explanations.

5. Sensitivity and Additional Analysis

In this section, we undertake a number of sensitivity and additional tests. Specifically, we test: (i) the sensitivity of the results to alternative size measures, (ii) the association between VC compensation and the individual components of the GUG, QS, and ARWU rankings (iii) if bonus payments to VCs are associated with university rankings (iv) the association between next year's VC compensation and the current year's movement in ranking position within Australia, and (v) the association between next year's change in rank position and current years VCs' compensation.

5.1 Alternative Size Measures Being Total Revenue, EFTSL and Total Staff

Three additional alternative size measures are independently used to assess if the results are robust to alternative size proxies. The three measures used are respectively (i) total revenue, (ii) effective full-time student load, and (iii) total academic and non-academic staff. The findings using these alternative size measures (results not tabulated) mirror the main test results in that the size measure is the only consistently statistically significant variable associated with the levels and growth in VCs' compensation.

5.2 GUG, QS and ARWU Individual Ranking Measures

The GUG rankings comprises eight individual ranking scores, while the QS and ARWU ranks comprise six individual rank scores (see Appendix C). The results (not tabulated) do not support any statistically significant results between the GUG individual rankings and VCs' compensation. The QS individual measures are significant on three from six components, QS-

Academic Reputation, QS-Employer Reputation, and QS-International Faculty. The ARWU individual rank measures are significant for two from six components being publications (PUB) and the weighted research score per full-time academic (PCP). However, just as in the main tests, once the alternative size measures are introduced, all individual external ranking measures become statistically insignificant.

5.3 Bonus Payments

Frumkin and Keating (2010) assert that the presence of surplus cash in the education sector may encourage bonuses and increases in compensation.[16] We provide preliminary evidence on the association between bonus payments and external rankings using the GUG rankings data. This analysis needs to be interpreted with caution, as we only have 23 observations for bonus payments to VCs. Our results indicate that external rankings are not associated with bonus payments. Of the alternative size measures, only domestic full-fee paying students have a significant positive association with VC bonus compensation. Of note is that despite international students providing more than double the revenue of domestic students there is a negative and statistically significant coefficient for international student revenues. These findings suggest that bonuses for VCs are predominantly based on metrics not included in the regression model (see Appendix A).

5.4 Changes in Next Years' VC Compensation and Current Year's Movement in Ranking Position within Australia

We also test the association between next year's VC compensation and the current year's movements in the university's ranking position amongst Australian universities. Only the QS rank measure is statistically significant, with the change in rank position having a negative

[16] Sample data reports the mean cash balance of universities is greater than $70 million.

influence on next years' VC compensation. Of the alternative size measures, government funding and international student revenue are significant, having a positive and negative influence on next years' VC compensation, respectively.

5.5 Changes in Next Years' Rank Position and Current Years' VCs' Compensation

We also test the association between next year's rankings (change in rank position) with current year's VC compensation (change in VC compensation). We find that there is very little support for rankings and changes in ranking position being associated with current levels or changes in VC compensation. On two occasions, we find a significant negative association between next years' ranking score and current VC compensation for the ARWU sample. For the changes model, we find no significant statistical association between changes in the rank position and VCs' compensation.

6. Conclusions, Policy Recommendations and Future Research

This study provides evidence on the pay for performance relation between VCs' compensation and external university rankings. There is only limited statistical support that external rankings are associated with the levels and changes in VCs' compensation. On the other hand, the alternative size measures comprising the components of revenue, particularly domestic student revenue, are consistently positively associated with the levels and increases in VCs' compensation.

Our results have a number of important policy implications. First, our results indicate that VCs have an incentive to maximise student numbers and associated revenue streams as this results in higher compensation. Universities overriding objectives ought to be improving teaching and research outcomes as clearly stated in the ICAC Report, 2015, hence, VCs compensation should be explicitly aligned to these objectives for which, metrics are provided by independent external ranking agencies. Given the homogeneous environment in which Australian

universities operate, an independent tribunal could be formed to determine VCs compensation not unlike the determination of politicians' compensation by the Remuneration Tribunal (Remuneration Tribunal Act, 1973; Remuneration and Allowances Act, 1990). Furthermore, the Tribunal could benchmark Australian VCs compensation against the compensation of VCs of international universities like Oxford University or The University of Auckland. Second, VCs compensation could have two explicit components comprising a base salary and bonus payments. The bonus payments should be tied to external, independent and quantifiable targets based on teaching, research, student employability, endowments amongst others. Third, universities annual reports ought to include clear reporting of VCs and DVCs with respect to pecuniary and non-pecuniary benefits and provide information on the financial and non-financial performance targets used to determine the levels and growth in VC compensation.

This reporting requirement could be consistent with that of the compensation disclosures of publicly listed companies. Our contention is that the above policy recommendations would align universities' objectives and performance better with VCs compensation. Finally, our research could potentially contribute to the "new review of performance based funding" (Dodd, 2019) of universities by the Federal Government.

Future research may extend this study in a number of respects. First, researchers could survey universities to obtain more information on explicit financial and non-financial performance indicators that are utilised by the remuneration committee to determine VCs' compensation. Currently, quantitative performance indicators are not disclosed in the annual reports for either levels or changes in VCs' compensation. Second, researchers can analyse the pay for performance link for executive compensation in other settings in the not-for-profit sector, including trade unions, professional associations, and charities.

References:

Adams, R., and D. Ferreira, 2008, Do directors perform for pay? *Journal of Accounting and Economics* 46, 154-171.

Australian Federal Government, 1988, Higher Education Funding Act. *Federal Register of Legislation.*

Australian Federal Government, 2003, Higher Education Support Act (HESA). *Federal Register of Legislation.*

Australian Federal Government Department of Education, Employment and Workplace Relations, 2013, Financial Reports of Higher Education Providers. (HEPS 2005 – 2012).

Australian Federal Government, Department of Education and Training, 2014 Export income to Australia from international education activity in 2013 – 14. Research Snapshot, November 2014.

Australian Government, 1973, Remuneration Tribunal Act.

Australian Government, 1990, Remuneration and Allowances Act.

Australian National University, 2015, Appointment of Vice-Chancellor and President, Information for Candidates.

Baber, W.R., P.L. Daniel, and A.A. Roberts, 2002, Compensation to Managers of Charitable Organizations: An Empirical Study of the Role of Accounting Measures of Program Activities, *The Accounting Review* 77, 679-693.

Bai, G., 2014, University President Compensation: Evidence from the United States, *Higher Education Studies* 4, 1-14.

Baimbridge, M., and C. Simpson, 1996, Rewards to academia: the remuneration of vice-chancellors and principals, *Applied Economics* 28, 631-639.

Balsam, S. and E. Harris, 2018, Nonprofit executive incentive pay, *Review of Accounting Studies* 23, 1665-1714.

Banker, R.D., J.M. Plehn-Dujowich, and C. Xian, 2009, Organizational Complexity and Executive Compensation: Evidence on the Compensation of University Presidents. Working paper (Fox School of Business, Temple University Philadelphia).

Bebchuk, L.A., and J.M. Fried, 2003, Executive Compensation as an Agency Problem, *The Journal of Economic Perspectives* 17, 71-92.

Bebchuk, L.A., and J.M. Fried, 2005, Pay without performance: Overview of the issues, *Journal of Applied Corporate Finance* 17, 8-23.

Bradley D, Noonan P, Nugent H and Scales B (2008) Review of Australian Higher Education – Final Report. Australian Federal Government, Canberra.

Brickley, J., and R. Van Horn, 2002, Incentives in nonprofit organizations: Evidence from hospitals, *Journal of Law and Economics* 45, 227–249.

Caers, R., C. Du Bois M. Jegers, S.D. Gieter, C. Schepers, and R. Pepermans, 2006, Principal-Agent relationships on the stewardship-agency axis, *Nonprofit Management and Leadership* 17, 25-47.

Cheng, S., 2014, Executive Compensation in Public Higher Education: Does Performance Matter? *Research in Higher Education* 55, 581-600.

Clements, K.W., and H.Y. Izan, 2008, The Stairway to the Top: The Remuneration of Academic Executives, *Australian Journal of Management* 33, 1-30.

Coulton, J., and S. Taylor, 2002, Option awards for Australian CEOs: The Who, What and Why, *Australian Accounting Review* 12, 25-35.

Dodd, T., 2014a, Six University VCs crack the $1m pay club. *The Australian Financial Review*, 30 September 2014.

Dodd, T., 2014b, Who pays for Universities? *The Australian Financial Review* 18 August, page 16.

Dodd, T., 2019, Performance framework details revealed. *The Australian* 7 August, 2019 page 27.

Free, C., E. Salterio, and T. Shearer, 2009, The construction of auditability: MBA rankings and assurance in practice, *Accounting, Organizations and Society* 34, 119–140.

Frumkin, P., and E.K. Keating, 2010, The Price of Doing Good: Executive Compensation in non-profit organisations, *Policy and Society*, 29, 269-282.

Graham, B., 2019, NSW Greens want 'commonsense' wage cap for publicly funded executives, *news.com.au,* (https://www.news.com.au/finance/work/careers/nsw-greens-want-commonsense-wage-cap-for-publiclyfunded-executives/news-story/47fbc53c60be57186b1882c4ec452e86)

Hansen, P., 2017, Communications Legislation Amendment (Executive Remuneration) Bill 2017. *The Senate Proof Bills, Commonwealth of Australia*, Thursday 17 August, page 76.

Hansmann, H.B. 1980, The Role of Nonprofit Enterprise, *The Yale Law Journal*, 89, 835-902.

Hare, J., 2012, Big pay for poor performers. *The Australian,* 6 June.

Hobson's (2005- 2012) The Good Universities Guide. *Daily Mail and General Trust PLC*.

Hood., C, 1989, Public Administration and Public Policy: Intellectual Challenges for the 1990s, *Australian Journal of Public Administration*, 48, 346-358.

Independent Commission Against Corruption (ICAC), (2015) Learning the Hard Way: Managing Corruption Risks Associated with International Students at Universities in NSW. *New South Wales Government*, (April 2015). Available at: www.icac.nsw.gov.au.

Jensen, M.C., and W.H. Meckling, 1976 Theory of the Firm: Managerial Behavior, Agency

Costs and Ownership Structure, *Journal of Financial Economics* 3, 305-360.

Lane, B., 2017, Strip control of VCs' pay from unis: Lib Dems. *The Australian,* 18 October,

Macquarie University, 2011, Annual Report, Macquarie University, Australia.

Manning, N., Z. Hasnain, and J.H. Pierskalla, 2012, Public Sector Human Resource Practices to Drive Performance. Available at: openknowledge.worldbank.org.

Monash University, 2011, Annual Report. Australia.

National Tertiary Education Union (NTEU), 2017, Australia tops world university rankings …. For VCs' pay. *The Advocate* 24(1): Front Cover and pages 18-19.

Nugent, V. 2015, Harding's pay jumps $79,000 as CQU vice chancellor ditches bonus. Townsville Bulletin, April 10, 2015

Parsons, L.M., and A.L. Reitenga, 2014, College and University Pay and Future Performance, *Accounting Horizons* 28, 125-142.

Pfeffer, J., and J. Ross, 1988, The compensation of college and university presidents, *Research in Higher Education* 29, 79–91.

Quacquarelli Symonds Limited (QS), 2005-2012, QS Top Universities Rankings. Available at: https://www.topuniversities.com/university-rankings.

Sedatole, K.M., A. Swaney, M.H. Yetman, and R.J. Yetman, 2013, Accounting-Based Performance Metrics and Executive Compensation in Nonprofit Organizations. Working Paper (University of California, Davis).

Shanghai Ranking Consultancy - Academic Ranking of World Universities (ARWU), 2005 – 2012, World Top 500 Universities. Available at: http://www.shanghairanking.com

Soh, L.H.C., 2007, The Market for Australian Vice-Chancellors, *Australian Journal of Managemen*t 32, 29-55.

The University of Sydney, 2012, Annual Report, Australia

University of Melbourne, 2014, Annual Report, Australia.

University of Technology Sydney, 2012, Annual Report, Australia.

University of Technology Sydney, 2016, Annual Report, Australia.

Van Puyvelde, S., R. Caers, C. Du Bois, and M. Jegers, 2012, The Governance of Nonprofit Organizations: Integrating Agency Theory With Stakeholder and Stewardship Theories, *Nonprofit and Voluntary Sector Quarterly* 41, 431-451.

Withers, G., 2014, Not as simple as just a boost to competition. *Australian Financial Review,* 18 August, 16.

Table 1 - Sample Construction for the period 2005-2012

	Good University Guide Ranking	Universities	VC Pay Observations
1.	Accredited Higher Education Providers	43	344
2.	Exclude International, Indigenous, Religious Higher Education Providers and non-publication of annual reports	-6	-48
4.	37 Universities covering an 8 year period	37	296
5.	Add years with two or more VCs in the same year		11
	Subtotal	37	307
6.	Exclude years that did not provide VC Compensation details.		-12
7.	Exclude years if departing VC during the year		-37
8.	Exclude years if VC is appointed during the year		-36
9.	Years missing GUG Rankings Observations		-40
	Final GUG Sample size after exclusions	**37**	**182**
0.	Less Universities / Observations not Included in QS Rankings	-12	-51
	Final QS Sample size after exclusions	**25**	**131**
11.	Less Universities / Observations not Included in ARWU Rankings	-4	-28
	Final ARWU Sample size after exclusions	**21**	**103**

Table 2 – Panel A: Variable Names Used in the Regression Modelling

Variable	Definition
Dependent Variable	
LnVCPay	Natural Log of Total VC Compensation
%ΔVCPay	% Change in Total VC Compensation
LnBonus	Natural Log of Bonus Pay
%ΔBonus	% Change in Bonus Pay
Performance Measures	
LnGUG Rank Score	Natural log of sum Sum of 'selected' Good Univesity Guide Rankings
ΔGUG Rank Score_iv	Instrumental variable for change in GUG Rank Score: 1 = Increase, 0 = Otherwise
LnQS Rank Score	Natural log of sum of QS rankings
ΔQS Rank Score_iv	Instrumental variable for change in QS Rank Score: 1 = Increase, 0 = Otherwise
LnARWU Rank Score	Natural log of sum of ARWU rankings
ΔARWU Rank Score_iv	Instrumental variable for change in ARWU Rank Score: 1 = Increase, 0 = Otherwise
Alternative Size Measures	
LnEndow	Natural log of endowments received comprising Donations & Bequests
%ΔEndow	% Change in Endowments
LnGovFund	Natural log of Government Funding Revenue
%ΔGovFund	%Change in Government Funding Revenue
LnResearch Income	Comprising DEST research funding & Australian Research Council grants
%ΔResearch Income	%Change in Research Income
LnDomFFRev	Natural log of Domestic Full Fee Paying Students Revenue
%ΔDomFFRev	%Change in Domestic Full Fee Paying Students Revenue
LnIntStuRev	Natural log of International Student Revenue
%ΔIntStuRev	%Change in International Student Revenue
Institutional Controls	
TCouncil	Number of Council Members
ChancellorExp	Indicator Variable if Chancellor is Ex-Government employee or Lawyer =1, 0 = Otherwise
TCampus	Number of Campuses
TFaculties	Number of Faculties
Financial Controls	
OpExp_R	Operating Expenses as a percentage of total revenues.
Debt/Equity	Debt to Equity ratio.
ROE	Net Operating Profit after Tax ÷ Total Equity

Table 3 - Descriptive Statistics

	Mean	Median	Std. Dev.	Minimum	Maximum	No.Obs.
Dependent variables						
VC Compensation	670,000	630,000	210,000	250,000	1,600,000	182
%ΔVCPay	12.20%	9.10%	17.70%	-36.10%	135.80%	130
Bonus Pay	170,000	160,000	120,000	55,000	530,000	23
%ΔBonus Pay	16.70%	13.60%	39.60%	-37.90%	116.00%	11
Performance Measures						
GUG Rank Score	26	25	6	12	36	182
ΔGUG Rank Score_iv	43.30%	0.00%	49.70%	0.00%	100.00%	164
QS Rank Score	51	47	19	14	92	131
ΔQS Rank Score_iv	50.90%	100.00%	50.20%	0.00%	100.00%	108
ARWU Rank Total	16	14	7	8	31	103
ΔARWU Rank Score_iv	60.30%	100.00%	49.30%	0.00%	100.00%	78
Alternative Size Measures						
Total Endowments (000)	6,515	1,581	12,000	28	85,000	182
%ΔEndowments	69.60%	1.60%	222.00%	-96.30%	1289.10%	130
Government Grants (000)	340,000	280,000	220,000	38,000	1,000,000	182
%ΔGovFund	9.00%	8.40%	7.90%	-19.90%	33.30%	130
Research Income	51,000	28,000	60,000	1,040	250,000	182
%ΔResearch Income	4.40%	4.40%	8.10%	-39.40%	32.30%	130
Domestic Student Income (000)	35,000	28,000	28,000	2,516	130,000	182
%ΔDomFFRev	6.50%	4.30%	21.20%	-62.90%	148.00%	130
International Student Revenue (000)	94,000	64,000	78,000	6,232	330,000	182
%ΔIntStuRev	9.80%	9.30%	10.70%	-24.50%	42.60%	130
Institutional Controls						
TCouncil	18.79	19.00	2.78	8.00	27.00	182
ChancellorExp	61.50%	1.00	48.80%	0.00%	100.00%	182
TCampus	4.91	4.50	2.78	1.00	16.00	182
TFaculties	6.49	6.00	3.37	2.00	17.00	182
Financial Controls						
OpExp_R	92.00%	92.60%	4.90%	74.10%	109.80%	182
Debt/Equity	32.80%	29.40%	18.80%	6.80%	110.00%	182
ROE	4.90%	4.50%	3.40%	-9.40%	14.90%	182

All variables are defined in Table 2.

Table 4: Pearson and Spearman Correlations Matrix

	LnVCPay	LnGUG Rank	LnQS Rank Score	LnARWU Rank	LnEndow	LnGovFund	LnResearch Income	LnDomFFRev	LnIntStuRev	TCouncil	TCampus	TFaculties	OpExp_R	Debt/Equity	ROE
LnVCPay	*1*	*0.479**	*0.379*	*0.519***	*0.251*	*0.258*	*0.318*	*0.450**	*0.449**	*-0.115*	*-0.130*	*0.052*	*-0.492***	*0.0785*	*0.303*
LnGUG Rank Score	0.404	*1*	*0.905****	*0.724****	*0.778****	*0.813****	*0.812****	*0.612****	*0.559***	*-0.056*	*0.383*	*0.632****	*0.054*	*0.180*	*-0.209*
LnQS Rank Score	0.268	0.881***	*1*	*0.816****	*0.797****	*0.890****	*0.880****	*0.666****	*0.571***	*-0.024*	*0.544***	*0.650****	*0.067*	*0.251*	*-0.143*
LnARWU Rank Score	0.430*	0.819***	0.889***	*1*	*0.533***	*0.704****	*0.851****	*0.431**	*0.294*	*0.091*	*0.596***	*0.324*	*-0.216*	*-0.109*	*0.172*
LnEndowments	0.161	0.757***	0.791***	0.668***	*1*	*0.866****	*0.724****	*0.758****	*0.775****	*0.325*	*0.349*	*0.885****	*0.435**	*0.336*	*-0.590***
LnGovFund	0.162	0.801***	0.917***	0.813***	0.871***	*1*	*0.845****	*0.624****	*0.590***	*0.154*	*0.614****	*0.860****	*0.329*	*0.239*	*-0.339*
LnResearch Income	0.186	0.840***	0.930***	0.888***	0.859***	0.961***	*1*	*0.515***	*0.433**	*0.133*	*0.772****	*0.552***	*0.129*	*0.097*	*-0.155*
LnDomFFRev	0.476*	0.628***	0.667***	0.554**	0.789***	0.716***	0.681***	*1*	*0.967****	*0.034*	*0.064*	*0.551***	*0.131*	*0.697****	*-0.303*
LnIntStuRev	0.469*	0.572**	0.558**	0.393	0.756***	0.645***	0.566**	0.962***	*1*	*0.095*	*-0.013*	*0.613****	*0.262*	*0.672****	*-0.419**
TCouncil	-0.254	-0.091	-0.039	-0.002	0.419*	0.157	0.174	0.108	0.121	*1*	*0.254*	*0.377*	*0.375*	*-0.375*	*-0.540***
TCampus	-0.131	0.414*	0.600**	0.600**	0.610***	0.723***	0.760***	0.393	0.248	0.414*	*1*	*0.375*	*0.213*	*-0.183*	*-0.077*
TFaculties	0.042	0.616***	0.704***	0.588**	0.912***	0.858***	0.784***	0.686***	0.665***	0.521**	0.711***	*1*	*0.624****	*0.230*	*-0.699****
OpExp_R	-0.530**	0.061	0.059	-0.159	0.394	0.254	0.232	0.067	0.184	0.558**	0.245	0.399	*1*	*0.075*	*-0.846****
Debt/Equity	0.163	0.131	0.160	-0.061	0.237	0.198	0.095	0.619***	0.647***	-0.357	-0.114	0.130	-0.038	*1*	*-0.175*
ROE	0.375	-0.171	-0.078	0.121	-0.532**	-0.248	-0.225	-0.240	-0.355	-0.630***	-0.225	-0.539**	-0.888***	-0.089	*1*

Correlation matrix between variables included in the regression models. Spearman correlations are reported above the diagonal. All variables are defined in Table 2.

Table 5: Results for testing the association between VCs' compensation and external performance measures

$$LnVCPay_{it} = \alpha_0 + \beta_1 \, Performance\ Measures_{it} + \beta_2 \, Alternative\ Size\ Measures_{it} + \beta_3 Institutional\ Controls_{it} + \beta_4 Financial\ Controls_{it} + \mathcal{E}_{it}$$

Dependent Variable		$LnVCPay_{it}$ (1)	$LnVCPay_{it}$ (2)	$LnVCPay_{it}$ (3)	$LnVCPay_{it}$ (4)	$LnVCPay_{it}$ (5)	$LnVCPay_{it}$ (6)	$LnVCPay_{it}$ (7)	$LnVCPay_{it}$ (8)	$LnVCPay_{it}$ (9)
Performance Measures										
Sample Based on		**GUG Obs**	**QS Obs**	**ARWU Obs**	**ARWU Obs**	**ARWU Obs**	**Total Sample**	**GUG Obs**	**QS Obs**	**ARWU Obs**
$LnGUG\ Rank\ Score_{it}$	+	0.089			0.168			0.041		
		0.270			*0.844*			*0.209*		
$LnQS\ Rank\ Score_{it}$	+		0.176			0.349***			0.033	
			1.617			*3.606*			*0.390*	
$LnARWU\ Rank\ Score_{it}$	+			1.135***						0.163
				5.631						*0.556*
Alternative Size Measures										
$LnEndowments_{it}$	+						-0.024	-0.024	-0.006	-0.041
							(-1.386)	*(-1.363)*	*(-0.203)*	*(-1.307)*
$LnGovFund_{it}$	+						0.448***	0.448***	0.295	0.214
							3.068	*3.046*	*1.144*	*0.665*
LnResearch Income	+						-0.033	-0.033	-0.206	-0.173
							(-0.238)	*(-0.235)*	*(-0.856)*	*(-0.777)*
$LnDomFFRev_{it}$	+						0.112*	0.107*	0.500***	0.333*
							1.904	*1.842*	*3.127*	*1.762*
$LnIntStuRev_{it}$	+						0.355***	0.356***	0.267	0.323
							3.037	*3.079*	*1.703*	*1.705*
Institutional Controls										
$TCouncil_{it}$	+/-	-0.025**	-0.009	0.002	-0.015	-0.002	-0.006	-0.006	-0.005	0.012
		(-2.094)	*(-0.783)*	*0.200*	*(-1.084)*	*(-0.168)*	*(-0.825)*	*(-0.801)*	*(-0.570)*	*1.029*
$ChancellorExp_{it}$		0.005	-0.011	0.108	0.093	0.098	0.025	0.026	-0.006	0.084
		0.060	*(-0.105)*	*1.575*	*1.048*	*1.275*	*0.466*	*0.467*	*(-0.073)*	*1.114*
$TCampus_{it}$	+	-0.092*	-0.027	-0.009	-0.017	0.002	-0.023	-0.022	-0.011	-0.004
		(-1.949)	*(-0.689)*	*(-0.163)*	*(-0.293)*	*0.054*	*(-1.678)*	*(-1.590)*	*(-0.550)*	*(-0.140)*
$TFaculties_{it}$	+	-0.016	-0.036	-0.032	-0.049**	-0.042	0.000	0.000	-0.031	-0.035
		(-0.636)	*(-1.571)*	*(-1.511)*	*(-2.428)*	*(-1.600)*	*(-0.010)*	*(-0.016)*	*(-1.498)*	*(-1.681)*
Financial Controls										
$OpExp\_R_{it}$	-	0.242	0.34	-0.204	-0.164	0.054	-0.329	-0.328	-0.408	-0.552
		0.589	*0.739*	*(-0.510)*	*(-0.344)*	*0.106*	*(-1.005)*	*(-0.997)*	*(-0.965)*	*(-1.415)*
$Debt/Equity_{it}$	-	0.342	1.168	3.545	4.003*	2.691	-0.506	-0.511	-1.144	0.534
		0.166	*0.511*	*1.586*	*1.768*	*1.232*	*(-0.506)*	*(-0.507)*	*(-0.646)*	*0.256*
ROE_{it}	+	0.342	1.168	3.545	4.003*	2.691	-0.506	-0.511	-1.144	0.534
		0.166	*0.511*	*1.586*	*1.768*	*1.232*	*(-0.506)*	*(-0.507)*	*(-0.646)*	*0.256*
Constant		14.830***	12.576***	8.662***	11.385***	10.912***	3.252***	3.135**	4.142**	4.825
		6.936	*9.874*	*7.072*	*6.473*	*10.165*	*2.926*	*2.557*	*2.379*	*1.697*
Observations		182	131	103	103	97	182	182	131	103
Adjusted R^2		0.076	0.075	0.202	0.024	0.197	0.609	0.606	0.442	0.434
F-Statistic		2.060	2.102	12.880	3.221	5.622	29.977	28.392	34.155	14.623
Fixed Effects (Uni & Year)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		*t statistics * p<0.10 ** p<0.05 *** p<0.010"*								

Table 6: Results testing the association between changes in VCs' compensation and changes in rankings

$$\%\Delta VCPay_{it} = \alpha_0 + \beta_1 \Delta\updownarrow Performance\ Measure\ Dummy_{it} + \beta_2 \Delta Alternative\ Size\ Measures_{it} + \beta_3 Institutional\ Controls_{it} + \beta_4 Financial\ Controls_{it} + \mathcal{E}_{it}$$

Dependent Variable		%ΔVCPay$_{it}$ (1)	%ΔVCPay$_{it}$ (2)	%ΔVCPay$_{it}$ (3)	%ΔVCPay$_{it}$ (4)	%ΔVCPay$_{it}$ (5)	%ΔVCPay$_{it}$ (6)	%ΔVCPay$_{it}$ (7)	%ΔVCPay$_{it}$ (8)
ΔPerformance Measures (1 = Up 0 = Otherwise)									
Sample Based on		**GUG Obs**	**QS Obs**	**ARWU Obs**	**ARWU Obs**	**ARWU Obs**	**GUG Obs**	**QS Obs**	**ARWU Obs**
ΔGUG Rank Score Dummy$_{it}$	+	0.062**			0.128***		0.015		
		2.101			*2.871*		*0.508*		
ΔQS Rank Score Dummy$_{it}$	+		-0.004			0.000		-0.040	
			(-0.111)			*(-0.002)*		*(-0.990)*	
ΔARWU Rank Score Dummy$_{it}$	+			0.026					0.065
				0.503					*1.306*
Δ Alternative Size Measures									
%ΔEndowments$_{it}$	+						-0.012**	-0.003	-0.022**
							(-2.490)	*(-0.379)*	*(-2.436)*
%ΔGovFund$_{it}$	+						-0.919	-0.609	-0.838
							(-1.270)	*(-0.856)*	*(-1.027)*
%ΔResearch Income$_{it}$	+						-0.104	-0.453	-0.745
							(-0.596)	*(-1.167)*	*(-1.430)*
%ΔDomFFRev$_{it}$	+						0.191***	0.154	0.128
							2.831	*1.229*	*0.651*
%ΔIntStuRev$_{it}$	+						-0.058	-0.238	-0.048
							(-0.255)	*(-0.718)*	*(-0.113)*
Institutional Controls									
TCouncil$_{it}$	+/-	-0.012**	-0.012	-0.001	0.003	-0.003	-0.004	-0.007	0.013
		(-2.036)	*(-1.562)*	*(-0.095)*	*0.177*	*(-0.213)*	*(-0.410)*	*(-0.529)*	*0.548*
ChancellorExp$_{it}$	-	-0.039	-0.043	-0.104	-0.156*	-0.108	0.012	-0.026	-0.048
		(-0.706)	*(-0.889)*	*(-1.455)*	*(-1.914)*	*(-1.600)*	*0.241*	*(-0.600)*	*(-0.669)*
TCampus$_{it}$	+	0.003	-0.026	-0.042	-0.05	-0.034	0.025	-0.034	-0.084
		0.089	*(-0.685)*	*(-0.811)*	*(-0.938)*	*(-0.737)*	*0.520*	*(-0.635)*	*(-1.422)*
TFaculties$_{it}$	+	0.003	0.025***	0.026**	0.033***	0.027**	0.000	0.037**	0.039**
		0.350	*2.955*	*2.238*	*3.806*	*2.219*	*(-0.006)*	*2.274*	*2.308*
Financial Controls									
OpExp_R$_{it}$	-	-0.179	-0.707	-0.103	0.249	-0.247	-2.031	-0.754	0.354
		(-0.172)	*(-0.320)*	*(-0.042)*	*0.110*	*(-0.108)*	*(-1.559)*	*(-0.318)*	*0.140*
Debt/Equity$_{it}$	-	-0.399	-0.471	-0.539	-0.608	-0.563	-0.259	-0.242	-0.005
		(-1.318)	*(-1.012)*	*(-0.804)*	*(-0.959)*	*(-0.892)*	*(-1.358)*	*(-0.790)*	*(-0.012)*
ROE$_{it}$	+	0.504	-0.162	0.773	0.992	0.504	-1.143	0.213	2.556
		0.301	*(-0.046)*	*0.188*	*0.271*	*0.133*	*(-0.750)*	*0.066*	*0.751*
Constant		0.561	1.133	0.425	0.017	0.584	2.142	1.028	-0.356
		0.500	*0.528*	*0.174*	*0.007*	*0.271*	*1.650*	*0.465*	*(-0.152)*
Observations		130	108	78	78	78	130	108	78
Adjusted R^2		0.004	0.016	-0.011	0.059	-0.014	0.120	0.053	0.078
F-Statistic		1.969	6.516	27.068	49.879	37.370	4.893	32.841	242.671
Fixed Effects (Uni & Year)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		*t statistics *p<0.10, ** p<0.05, *** p<0.010*							

Table 7: Results testing the association between next years' VC compensation and current year rankings

$$LnVCPay_{it+1} = \alpha_0 + \beta_1 \, Performance\ Measures_{it} + \beta_2 \, Alternative\ Size\ Measures_{it} + \beta_3 \, Institutional\ Controls_{it} + \beta_4 Financial\ Controls_{it} + \mathcal{E}_{it}$$

Dependent Variable		$VCPay_{t+1}$ (1)	$VCPay_{t+1}$ (2)	$VCPay_{t+1}$ (3)	$VCPay_{t+1}$ (4)	$VCPay_{t+1}$ (5)	$VCPay_{t+1}$ (6)	$VCPay_{t+1}$ (7)	$VCPay_{t+1}$ (8)	$VCPay_{t+1}$ (9)
Performance Measures										
Sample Based on		**GUG Obs**	**QS Obs**	**ARWU Obs**	**ARWU Obs**	**ARWU Obs**	**Total Sample**	**GUG Obs**	**QS Obs**	**ARWU Obs**
LnGUG Rank Score$_{it}$	+	0.075			0.112			-0.310		
		0.219			*0.462*			*(-0.777)*		
LnQS Rank Score$_{it}$	+		0.154			0.256***			0.055	
			1.519			*2.998*			*0.376*	
LnARWU Rank Score$_{it}$	+			1.154***						0.337
				7.049						*1.455*
Alternative Size Measures										
LnEndowments$_{it}$	+						-0.005	-0.005	-0.009	-0.011
							(-0.691)	*(-0.593)*	*(-1.351)*	*(-1.648)*
LnGovFund$_{it}$	+						-0.383	-0.421	0.100	0.690***
							(-1.017)	*(-1.137)*	*0.296*	*4.188*
LnResearch Income	+						-0.178	-0.104	-0.288	-0.844*
							(-0.900)	*(-0.552)*	*(-0.765)*	*(-1.941)*
LnDomFFRev$_{it}$	+						0.019	0.041	0.075	0.331**
							0.175	*0.365*	*0.459*	*2.151*
LnIntStuRev$_{it}$	+						-0.444*	-0.436	-0.165	-0.489**
							(-1.730)	*(-1.653)*	*(-0.605)*	*(-2.471)*
Institutional Controls										
TCouncil$_{it}$	+/-	-0.017*	-0.009	-0.009	-0.022	-0.005	0.020	0.027	0.018	-0.058***
		(-1.798)	*(-0.673)*	*(-0.601)*	*(-1.488)*	*(-0.309)*	*0.515*	*0.649*	*0.392*	*(-3.034)*
ChancellorExp$_{it}$		0.032	0.041	0.114***	0.105***	0.109**	-0.085	-0.092	0.003	0.277***
		0.313	*0.365*	*3.470*	*4.321*	*2.888*	*(-0.659)*	*(-0.821)*	*0.018*	*4.391*
TCampus$_{it}$	+	-0.063*	-0.015	0.000	-0.012	0.012	0.057	0.062	0.017	0.098**
		(-2.026)	*(-0.530)*	*0.000*	*(-0.341)*	*0.433*	*0.587*	*0.600*	*0.225*	*2.221*
TFaculties$_{it}$	+	-0.040*	-0.044***	-0.031***	-0.046***	-0.037**	-0.027	-0.025	-0.026	-0.037*
		(-1.783)	*(-3.482)*	*(-2.988)*	*(-4.908)*	*(-2.702)*	*(-1.664)*	*(-1.599)*	*(-1.117)*	*(-1.846)*
Financial Controls										
OpExp_R	-	-2.084	-0.928	-0.242	0.599	-0.314	-3.088**	-3.102**	-0.824	-0.254
		(-1.444)	*(-0.969)*	*(-0.319)*	*0.634*	*(-0.337)*	*(-2.293)*	*(-2.389)*	*(-1.018)*	*(-0.328)*
Debt/Equity$_{it}$	-	-0.124	0.448*	0.059	0.163	0.483	0.585	0.460	0.865**	0.557*
		(-0.500)	*1.804*	*0.355*	*0.477*	*1.431*	*1.388*	*1.328*	*2.776*	*1.755*
ROE$_{it}$	+	-0.047	-0.352	0.547	2.378	1.12	-1.642	-1.463	0.425	1.037
		(-0.026)	*(-0.235)*	*0.402*	*1.394*	*0.789*	*(-0.858)*	*(-0.777)*	*0.281*	*0.664*
Constant		16.027***	14.201***	10.948***	13.246***	12.887***	15.911***	16.805***	13.576***	13.424***
		7.968	*12.422*	*12.577*	*7.394*	*13.134*	*10.363*	*7.926*	*10.052*	*11.574*
Observations		131	99	75	75	70	90	90	80	55
Adjusted R^2		0.188	0.144	0.359	0.129	0.277	0.158	0.162	0.100	0.510
F-Statistic		4.765	6.403	15.347	15.806	6.665	3.293	3.651	8.936	33.007
Fixed Effects (Uni & Year)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		*t statistics * p<0.10 ** p<0.05 *** p<0.010"*								

Appendix A:

(i) Examples of Annual Performance achievements based on Rankings included in Annual Reports.

Monash University Annual Report 2011 – "The overall indicators were positive with Monash rising 12 places in the Shanghai Jiao Tong (ARWU) rankings and an estimated 61 places in the Times Higher Education rankings scale.

Professor Ed Byrne, AO Vice-Chancellor and President

University of Melbourne Annual Report 2014 – "This is the first time an Australian institution has been ranked in the Top 50 of the best research universities in the world. Ranked 44th in the Academic Rankings of World Universities The University of Melbourne was ranked 44th in the Academic Rankings of World Universities (ARWU) from Shanghai Jiao Tong University, the first time an Australian institution has been ranked in the top 50 on the ARWU list of best research universities in the world."

Professor Glyn Davis AC Vice-Chancellor.

University of Technology Sydney, Annual Report 2016 - For the first time we ranked in the top 200 universities globally by the QS World University Rankings. We also ranked as the top young university in Australia by the Times Higher Education 150 Under 50 Rankings 2016 and the QS Top 50 Under 50 2016-2017. Our rankings success is reflected in our research funding outcomes where we saw improved success rates in almost every Australian Research Council scheme.

Professor Attila Brungs, Vice-Chancellor and President

(iii) Advertisements for the selection and appointment of Vice Chancellors

Australian National University recruitment of Vice Chancellor 2015

"Position Description and Selection Criteria

Role of the Vice –Chancellor

ANU is a research-intensive educational institution of international distinction, one of the top 100 - and, in some rankings, in the top 25 - universities in the world, and one of the top two in Australia.

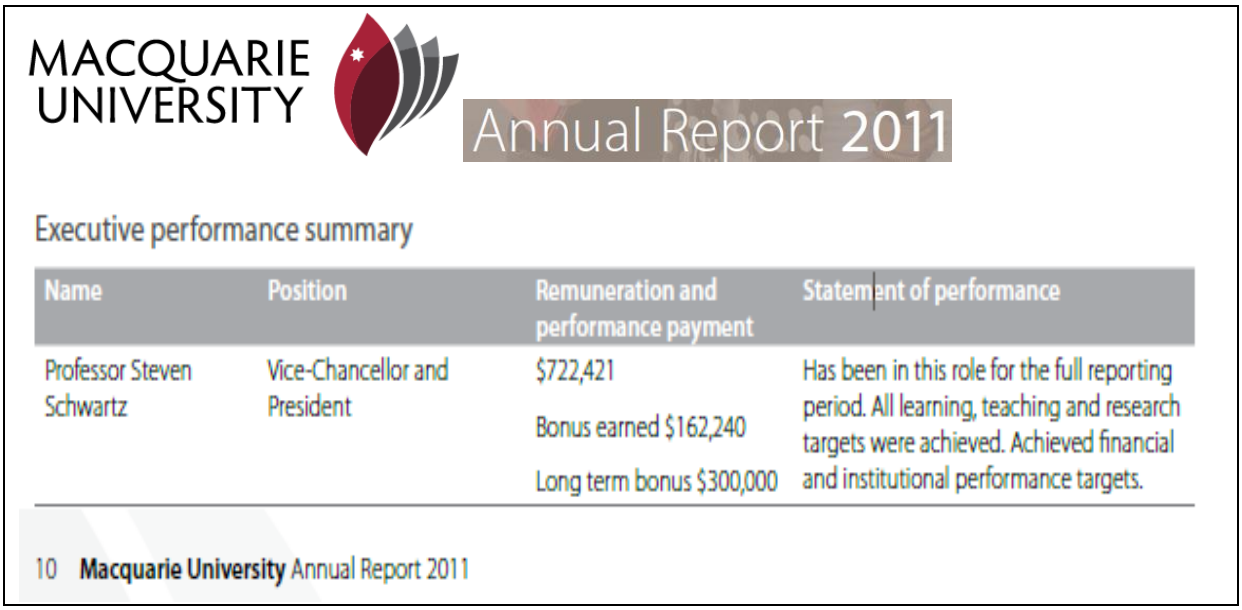
The Vice-Chancellor, as President and Chief Executive Officer, is responsible for leading and managing the University's academic, operational and external affairs—shaping, articulating and implementing the University's strategic objectives in research, education and contribution to public policy development.

The Vice-Chancellor is appointed by the University Council, is responsible to it through the Chancellor for the leadership and management of the University, and works closely with the Council in the exercise of its governance roles of strategic oversight, ensuring effective overall management and ensuring responsible financial management."

Extract from "Appointment of Vice-Chancellor and President – Information for candidates", Australian National University, page 36.

Appendix B:

Extracts from the annual reports issued by Macquarie University 2011, Sydney University 2012 and the University of Technology Sydney 2012, disclosing VCs' compensation, comprising base pay and bonus pay.



MACQUARIE UNIVERSITY

Annual Report 2011

Executive performance summary

Name	Position	Remuneration and performance payment	Statement of performance
Professor Steven Schwartz	Vice-Chancellor and President	$722,421 Bonus earned $162,240 Long term bonus $300,000	Has been in this role for the full reporting period. All learning, teaching and research targets were achieved. Achieved financial and institutional performance targets.

10 **Macquarie University** Annual Report 2011

UNIVERSITY OF TECHNOLOGY SYDNEY University of Technology Sydney – Annual Report 2012 – page 125

Executive performance and remuneration[3]

Name	Position and level[4]	2012 remuneration package (not including performance incentive)	Market relativity	Payment based on 2011 performance	Results
Professor Ross Milbourne	Vice-Chancellor and President – senior staff level 7	$706,793 (including salary: $434,314, superannuation: $73,833, vehicle, inclusive of FBT: $15,746 and accommodation, inclusive of FBT: $182,900)	At/around median for Vice-Chancellors in our selected comparator group of universities	$142,500	The University's performance was strong in 2011, particularly in the areas of research and international. Professor Milbourne successfully met the performance expectations contained in his performance agreement and contributed strongly to building the external profile of UTS and the national higher education debate.

THE UNIVERSITY OF SYDNEY **– Statutory Report 2012 (page 46)**

"Vice-Chancellor and principal **Dr Michael Spence**

BA LLB Sydney DPhil PGDipTheol Oxf

Remuneration: $744,143 Performance bonus: $155,000

This remuneration figure includes use of a residence owned by the University. The residence is required to be available and is used regularly for official University functions and promotional activities.

Dr Spence's leadership of the University in 2012 resulted in a year of considerable success during a difficult time, particularly in a year when the University undertook an unprecedented change management procedure to reduce staffing costs. There were, however, specific and notable achievements. In financial matters, the full-year result shows an operating margin that is in line with budget and reflected the successful execution of a number of operating improvement strategies that were initiated during the year. Faculties and business units were able to increase student load and deliver student fee revenue in line with their overall targets; discretionary academic staff costs were controlled, and salary cap targets were used to control and generate savings across the University. The results of the federal government's 2012 Excellence in Research for Australia (ERA) initiative saw a dramatic improvement compared to the University's performance in the earlier 2010 trial: 51 of the 99 subfields evaluated achieved an improved rating and no ratings were below world standard. In a few cases, ratings leapt from being rated below world standard in 2010 to well above world standard in 2012. The Australian Research Council, when it released its comment on the outcome, ranked Sydney and Melbourne as the two leading universities for research quality. The ERA results are a true reflection of the excellence of research produced by the University's researchers, and of the University's ability under Dr Spence's leadership to set a collective vision and work together in achieving it. Finally, for the second consecutive year, the University generated more philanthropic support than any other Australian university – and by a sizeable margin – demonstrating Sydney's ability to engage our donor community in unprecedented ways."

Appendix C:

Individual Ranking measures used to determine the total rank score.

Components of GUG Ranking Measures	
ST_DemG	Student demand for the university
Res_Grants	Ability to attract research funding.
Research Intensity	Research publications
Prop>25G	Proportion of students aged greater than 25.
International Students	Proportion of international students
Grad_Start_SalG	Graduate starting salary
Get_Job	Ability to get a job.
Pos_Grad_OutG	Positive graduate outcomes
Components of QS Ranking Measures	
$Alumni_{arwu}$	Alumni of an institution winning Nobel Prizes and Fields Medals
$Award_{arwu}$	Staff of an institution winning Nobel Prizes and Fields Medals
$HICI_{arwu}$	Highly cited researchers in 21 broad subject categories
NS_{arwu}	Papers published in Nature and Science*
PUB_{arwu}	Papers in Science Citation Index-expanded & Social Science Citation Index
PCP_{arwu}	Per capita academic performance of an institution
Components of ARWU Ranking Measures	
$Acad\_Rep_{qs}$	Academic reputation - teaching and research quality
Emp_Rep_{qs}	Employer reputation
$Fac\_Stud\_Ratio_{qs}$	Faculty student ratio
$Cits\_per\_faculty_{qs}$	Citations per faculty
$Int\_Faculty\_Ratio_{qs}$	International faculty ratio
$Int\_Stud\_Ratio_{qs}$	International student ratio

Appendix D:

University listing, ranking participation, classification and compensation data

	University	GUG[1]	QS[2]	ARWU[3]	University Grouping	VC Bonus Obs.	Average Salary 2005-2012	Average Growth in VC Pay 2005-2012
1	Australian Catholic University (ACU)	*			Other		693,333	12.01%
2	Australian National University (ANU)	*	*	*	GO8	1	949,396	21.78%
3	Central Queensland University (CQU)	*			Regional		550,833	12.95%
4	Charles Darwin University (CDU)	*			IRU		612,666	12.42%
5	Charles Sturt University (CSU)	*			Other		500,000	
6	Curtin Univesity of Techgnology (CUT)	*	*	*	ATN		646,667	11.69%
7	Deakin University (DEAK)	*	*		Other		648,333	13.95%
8	Edith Cowan University (ECU)	*			Other		586,667	9.35%
9	Flinders University (FLU)	*	*	*	IRU	2	560,666	19.32%
10	Griffith University (GRU)	*	*	*	IRU		609,375	7.56%
11	James Cook University (JCU)	*	*	*	IRU		544,500	12.87%
12	La Trobe University (LAT)	*	*	*	IRU		677,500	15.51%
13	Macquarie University (MACQ)	*	*	*	Other	2	907,577	23.52%
14	Monash University (MON)	*	*	*	GO8	7	807,785	8.84%
15	Murdoch University (MURD)	*	*	*	IRU		752,572	10.69%
16	Queensland University of Technology (QUT)	*	*		ATN		593,554	11.40%
17	Royal Melbourne Institute of Technology (RMIT)	*	*		ATN		702,312	9.29%
18	Southern Cross University (SCU)	*			Regional		658,750	11.30%
19	Swinburne University of Technology (SWN)	*	*	*	Other		503,333	11.11%
20	The University of Adelaide (UADEL)	*	*	*	GO8		568,333	34.70%
21	The University of Melbourne (UMEL)	*	*	*	GO8		728,750	6.91%
22	The University of New South Wales (UNSW)	*	*	*	GO8		595,000	7.98%
23	The University of Newcastle (NEWC)	*	*	*	Other	2	546,666	20.73%
24	The University of Queensland (UQ)	*	*	*	GO8		867,500	4.14%
25	The University of Sydney (USYD)	*	*	*	GO8	3	521,411	12.27%
26	The University of Western Australia (UWA)	*	*	*	GO8		893,785	-6.05%
27	University of Ballarat (UB)	*	*		Regional		601,666	10.54%
28	University of Canberra (UCAN)	*	*		Other		1,012,500	8.77%
29	University of New England (UNE)	*		*	Regional	2	620,000	17.64%
30	University of South Australia (USA)	*	*		ATN		451,833	16.94%
31	University of Southern Queensland (USQ)	*			Regional	1	497,857	15.72%
32	University of Tasmania (UTAS)	*	*	*	Other		884,918	-3.17%
33	University of Technology Sydney (UTS)	*	*	*	ATN	3	459,916	8.48%
34	University of the Sunshine Coast (USC)	*			Regional		668,193	7.43%
35	University of Western Sydney (UWS)	*	*		Other		668,333	17.49%
36	University of Wollongong (UOW)	*	*	*	Other		681,375	7.73%
37	Victoria University (VU)	*			Other		545,000	7.25%
	Number of Universities in Sample	**37**	**27**	**21**		**23**	**657,266**	**11.97%**

Rankings

[1] GUG - Good University Guide Ranking Observations

[2] QS - Quacquarelli Symonds - QS World University Rankings

[3] ARWU - Shanghai Rankings - Academeic Ranking of World Universities

University Groupings	Count
GO8 - Australian University Group of Eight	8
ATN - Australian University Technology Network	5
IRU - Innovative Research Universities	6
Regional - Regional Universities Network	6
Other - No grouping	12
	37