Is there an association between the levels and changes in Vice Chancellors' and Chief Executive Officers' compensation and the performance of Australian universities and Government Business Enterprises?

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Certificate of Authorship / Originality

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as part of the collaborative doctoral degree and/or fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract:

Universities and Government Business Enterprises (GBEs) are economically significant and form part of the Australian public sector. Over the last thirty years both Universities and GBEs have gone through significant regulatory changes with respect to enhancing their efficiency and effectiveness. These changes have led to, amongst other things, explicit and implicit performance requirements for these entities coupled with the deregulation of University Vice Chancellor (VC) and Chief Executive Officer (CEO) of GBEs compensation. This thesis investigates the question of:

> "Is there an association between the levels and changes in VCs' and CEOs' compensation and the performance of Australian universities and GBEs?"

The key findings are: (i) there is no association between external University rankings and levels of and changes in VC compensation, (ii) there is no association between financial performance measures of GBEs and levels of and changes in CEO compensation even after controlling for their community service obligations. The only explanatory variable that is associated with both VCs' and CEOs' compensation is size. Both sets of results are robust with respect to alternative econometric specifications, alternative variable specifications and other sensitivity tests.

Chapter 1

Introduction

Universities and Government Business Enterprises (GBEs) are an economically significant part of the Australian public sector. Universities, which are primarily publicly owned and funded institutions, received total government funding of $16.7 billion.[1] In 2014, universities became the third largest export revenue generator for the Australian economy with $12.5 billion[2] dollars in export income. Similarly, State and Commonwealth owned GBEs had total revenues of $100.2 billion[3] with an operating surplus of $21.2 billion[4] dollars and dividend distributions amounting to $9.9 billion[5] in 2014.

Over the last thirty years, both universities and GBEs have gone through significant regulatory changes with respect to enhancing efficiency and effectiveness. These changes have led to, amongst other things, explicit and implicit performance requirements for these entities and the deregulation of University Vice Chancellor (VC) and Chief Executive Officer (CEO) of GBEs' compensation. While different aspects of the regulatory changes have been examined in prior literature under the heading of "education revolution" (Dawkins 1988; Bradley 2008) and New Public Management (NPM) (Gruening, 2001; Lane, 2000; Hood, 1989), I am not aware of any study that has investigated the question as to whether the deregulation of VCs' and CEOs' compensation has led to a better performance outcome for these institutions. Accordingly, the primary objective of this thesis is to address this issue.

[1] Australian Government, Department of Education Employment and Workplace Relations, Financial Reports of Higher Education Providers, (HEPS) 2014.
[2] Australian Government, Department of Education and Training (November 2015). Export income to Australia from international education activity in 2014–15. Research Snapshot.
[3] Australian Bureau of Statistics - 55120DO001_201314 Government Finance Statistics, Australia, 2013-14
[4] Australian Bureau of Statistics - 5204.0 Australian System of National Accounts, Table 6. Income from Gross Domestic Product (GDP), Current Prices.
[5] Australian Bureau of Statistics - 55120DO001_201314 Government Finance Statistics, Australia, 2013-14.

Traditionally, the university sector has been government funded and administered utilising public sector bureaucratic processes with regulated compensation structures for all management levels, including the VC. Since the 1980's, through a number of reviews and policy changes (Bradley, 2008; Dawkins, 1988), government funding of universities has decreased with funding becoming dependent on the introduction of tuition fees for local students and by attracting an ever increasing number of full fee paying international students.

A significant trend emanating from the regulatory and structural changes in the university sector has been the deregulation of Vice Chancellor and senior university executive salaries. This has led to an explosion in the level of and growth in the salary of the Vice Chancellor. At the same time, there is both an explicit and implicit expectation that the performance of universities has also improved as measured by quality of education, entry qualifications, retention / completion rates and research output. Vice Chancellors themselves often emphasise the importance of achievements in these areas (Hare, 2012; Withers, 2012) and, in fact, they often form part of their job description.[6] University rankings provide independent and externally observable measures of performance with respect to educational outcomes, research quality and overall university reputation. In this thesis, I provide evidence on the association between VC salaries and their performance based on university rankings using hand collected data for the period 2005 to 2012 inclusive.

The key findings are that VC compensation levels and growth are not associated with university rankings but are driven primarily by university size. My results are robust with

[6] Australian National University, 2015. Appointment of Vice – Chancellor and President, Information for candidates. http://www.anu.edu.au/files/resource/VC-Recruitment.PDF

respect to alternative measures for size,[7] institutional characteristics and performance measures.[8]

Since the 1980's, Australian GBEs have also undergone significant transformation under the umbrella of NPM. This has resulted in the removal of traditional bureaucratic structures and employing corporate sector management practice and governance structures for GBEs. This was achieved by the introduction of legislation[9] and regulations[10] making explicit reference to performance based on profitability[11] utilising measures such as profit margin, return on equity, and other financial measures. The clear intent of NPM has been to enhance efficiency and effectiveness of public sector commercial activities based on corporate sector governance structures and managerial practices. Concurrently, the regulated salary structures of CEOs and senior executives have been replaced by three to five year contracts with negotiated compensation contracts.

Despite the emphasis on profitability, some GBEs are required to maintain Community Service Obligations (CSOs) where certain sectors of the community[12] receive preferential treatment by way of subsidised services which may affect their profitability. Accordingly, after controlling for the effects of CSOs, Chapter 3 provides evidence on the association between CEO compensation and GBE performance.

[7] Total Revenue, Total students EFTSL (Effective Full time Student Load) and Total Staff numbers.
[8] Alternative performance measures include Good Universities Guide, Academic Ranking of World Universities (ARWU), and QS Worldwide University Rankings.
[9] Australian Government, Public Governance Performance and Accountability Act (PGPA) 2013, which replaced the Financial Management and Accountability Act (1997).
[10] ("Resource Management Guide No. 126 (RMG 126) 'Commonwealth Government Business Enterprise Governance and Oversight Guidelines' (August 2015).
[11] The profitability measures are derived from results reported in the financial statements contained in the annual reports of GBEs.
[12] Pensioners, Community members suffering disabilities, postal services with a single unit cost rate for postage irrespective of the cost of delivery.

The key findings of Chapter 3 are that the levels and growth of CEOs' compensation are not associated with the financial performance of GBEs. My results are robust with respect to alternative measures of performance,[13] institutional setting, consideration of CSOs, and size.[14]

The remaining sections of this thesis are structured as follows.

In Chapter Two, I provide a detailed description of the regulatory changes applicable to the operations of universities, their institutional setting, details of the experimental design and empirical results for the pay / performance relation of VCs. The results are supported by sensitivity tests utilising alternative variables and econometric designs.

In Chapter Three, I provide a detailed description of the legislation and regulatory requirements, institutional setting, details of the experimental design and empirical results investigating the pay / performance relation of CEOs of GBEs. The results are supported by sensitivity tests utilising alternative variables and econometric designs.

In Chapter Four, I provide a summary of the conclusions of this thesis and highlight governance related issues that policy makers could consider with respect to the determination of senior executive compensation. In addition, commentary on accounting disclosures' shortcomings in both the university and GBE sectors is provided along with the identification of areas for potential future research.

[13] Performance measures utilised include Return on Assets, Profit Margin, Asset Turnover and a combination of Profit Margin and Asset Turnover.
[14] Alternative size measures utilised are Total Revenue in the main tests and Total Assets in the sensitivity.

Chapter 2

Relation between Vice Chancellors' Compensation and the performance of Australian Universities

1 Introduction

There is well-established literature on private sector CEOs' compensation structure, determinants and the relation between pay and performance (e.g. Murphy, 2013; Matolcsy and Wright, 2011; Core et al., 2008). Conversely, the literature on CEO compensation in the public sector, including university Vice Chancellors (VCs) and Presidents is limited. Baimbridge and Simpson (1996) and a number of studies focus on the increases and determinants of VCs' compensation (Essaji and Horton, 2010; Clements and Izan, 2008; Tarbert et al., 2008), whilst others provide evidence on the association between VCs' compensation and some internal or external performance indicators (Cheng, 2014; Parsons and Reitenga, 2014). However, I am not aware of any study addressing the pay and performance relation of VCs / Presidents of universities utilising external and independently determined performance indicators such as university rankings. Accordingly, the objectives of this study are (i) to provide descriptive evidence on the levels and changes of VCs' compensation in Australian universities, and (ii) to evaluate the association between VCs' compensation and the performance of universities as measured by external ranking agencies. University rankings are used because they are independently verifiable performance measures and both university management and the media place importance on them (Hare, 2016; McNeilage, 2014; Dodd, October 2014; Marginson, 2007).

There are a number of motivations for this chapter. First, Australian universities are economically significant, hence VC decisions and actions can have a significant economic impact. For example, Australian universities consume a significant amount of the Australian Government's total education budget with approximately 60% of total

university revenues being government funded.[15] Further, university revenues generated by international student demand represent approximately 16% of total university revenues with the absolute sum of international student revenues making education the third largest export earner for Australia.[16]

Between 2005 and 2012, total revenues for all Australian universities grew by 176% (from $14.3 to $25.2 Billion) and total assets grew by 169.6% (from $35.1 to $59.5 billion).[17] At the same time, the commercialisation changes[18], coupled with the economic significance of the university sector, have resulted in total VC compensation, over the same period (2005 – 2012) growing by 163.6% (from $17.6 to 28.8 million).[19] Due to the economic significance of the university sector, it is worthwhile to examine the determinants of VC compensation and changes to VC compensation over time and ask the question whether this compensation is related to external university performance indicators. To date, however, there is little evidence on the association of VC compensation and changes in VC compensation and university performance. Hence, this chapter provides evidence on the changes in VC compensation from a pay-performance perspective.

Second, universities have been transformed from the traditional collegiate model into academic enterprises managed by academic executives (Clements and Izan, 2008;

[15] As per Higher Education Providers Reports (HEPS) Published by the Department of Education, Employment and Workplace Relations (DEEWR), 2012.
[16] Australian Government, Department of Education and Training (November 2015). Export income to Australia from international education activity in 2014–15. Research Snapshot, November 2015.
[17] Australian Government report titled, "Financial Reports of Higher Education Providers" 2005 – 2012.
[18] 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 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. The education minister in 2014, Christopher Pyne, proposed changes ("Education Revolution," 2014) that are aimed at enhancing the growth and competitiveness between tertiary education providers, once again with the aim of reducing government funding for universities.
[19] Information on VC salaries collected from the Remuneration section of the Annual reports of 37 Australian universities.

Marginson and Considine, 2000), who operate in an unregulated executive salaries market. Both the size and growth of VC compensation in Australian universities have attracted media attention, (McNeilage, 2013; Withers, 2012; Hare, 2012). Similarly, large remuneration packages for CEO's in the commercial sector has also attracted media scrutiny and provided the impetus for extensive academic research investigating the pay-performance link of CEO's (Shan and Walter 2015; Core et al. 2008). Given the growth in the economic significance of universities and VC salaries, there is societal concern about both the level of VC salaries and the non-disclosure of the drivers of the growth in salaries.[20] One way of overcoming these concerns is by demonstrating that society gets 'value for money' from higher levels of VC compensation even in the absence of satisfying the disclosure requirements as specified by AASB124[21] and AASB1046.[22] Thus, it is important to determine if there exists a relation between the university's performance and changes in VC salaries. This chapter addresses this issue by providing empirical evidence on the impact of changes in performance measures and their relation to changes in VC compensation.

In order to examine the pay-performance relation, proxies are required for university performance. Many studies have investigated the pay performance relation in the corporate sector for CEOs using accounting and market based performance measures (Core et al., 1999; Bebchuk and Fried, 2005). However, earnings and market based performance measures do not apply to universities, as universities operate in the not-for-

[20] Dodd, T., Salaries NTEU calls for more transparency – Six university VCs crack the $1m pay club, *The Australian Financial Review,* 30 September 2014.
[21] Australian Government, Australian Accounting Standards Board - AASB124 - Related Party Transactions
[22] Australian Government, Australian Accounting Standards Board - AASB 1046 Director and Executive Disclosures by Disclosing Entities - January 2004

profit sector. Hence, a question arises as to what performance measures are to be used to evaluate VC performance.

Given the overall responsibility of the VC / President, it is not unreasonable to expect that compensation and changes in compensation are tied to performance. However, the annual reports of universities do not provide any detail regarding the setting of performance measures nor whether performance targets have been achieved. Despite this, annual salary growth was in excess of 10% per annum over the period 2005 - 2012. In the absence of performance disclosures, given the emphasis placed on external rankings by both recruitment advertisements[23] for VCs and the annual reports[24] of universities, rankings provide an objective and independently verifiable performance measure to assess both VC and university performance. In fact, the measures used by ranking agencies in many ways mirror the job description of the VC / President. Therefore, based on the premise that the quality of education and university reputation are of significant importance as performance measures, the rankings provided by national and international ranking agencies are used in this chapter as a measure of university performance.

Based on a sample of 37 universities[25] between 2005 and 2012, the results of this study are not indicative of any systematic relation between pay and movements in pay that could be related to identifiable performance metrics such as Hobson's, The Good Universities Guide (GUG) national rankings, Academic Ranking of World Universities (ARWU) and QS World University Rankings (QS). The only factor that is found to consistently explain VC compensation in the regression models is university size.

[23] Australian National University, 2015. Appointment of Vice – Chancellor and President, Information for candidates.
[24] University of Melbourne, Annual Report, 2012.
[25] Australian Government, The Higher Education Support Act (HESA) 2003 has accredited 43 universities as listed in Tables A, B and C of the Act. However, annual reports containing remuneration details for VCs are only available for 37 of the 43 universities.

This chapter makes a number of important contributions. First, there is a societal concern about both the levels and growth in VC compensation. This public concern has been expressed in a number of articles in the Australian financial press with respect to both the amount of and the relative increase in VCs' compensation compared with academic salary increases. For example, Dodd (September 2014) headlines with "*Six university VCs crack the $1m pay club"* whilst McNeilage (2013) notes that *"Uni bosses earn 10 times more than staff", and* Hare (2012) highlights *"Big Pay for Poor Performers".* The results of this thesis provide support for societal concerns in the sense that VCs' compensation is not related to external independent measures of university performance.

Second, it adds to the academic literature on executive CEO / VC compensation in a unique setting where the absence of residual equity interests, profit and wealth motivations pose a significant challenge in the commercialisation of the higher education sector. With respect to universities, the ownership, objectives and governance structures differ significantly from those in the corporate sector. Whilst there have been extensive studies examining the determinants and effectiveness of corporate boards (Adams et al., 2010) and their impact on executive compensation in the corporate sector, these results may not be applicable in the university sector. Hence, this chapter provides indirect evidence on whether university councils develop and administer VC compensation plans that link pay with performance. Third, corporatisation of the university sector has led to the deregulation of VC and senior executive salaries that do not appear to be tied to any performance indicators. Therefore, the findings may assist policy makers to refine university corporate governance mechanisms with respect to their monitoring role of VCs. For example, the university "board of directors" (referred to as council or senate), may be required to set externally quantifiable and verifiable performance measures for

VCs' overall compensation. These measures could include university rankings, raw entry scores of students, external funds raised and employability of graduates.

Finally, this thesis, also makes a contribution to the academic literature by providing the first evaluation and evidence in the Australian setting on the association between VCs' compensation and universities performance measured using external rankings. The rest of this chapter is set out in the following way. Section 2 presents the literature review and theory development. Section 3 describes the sample and data used in the study and outlines the research design. Section 4 reports the main results of the study, section 5 details the results of sensitivity analysis tests and conclusions are detailed in Section 6.

2 Literature Review and Hypothesis Development

2.1 Institutional Setting of Australian Universities

A unique characteristic of the university setting in Australia is that all universities are federally funded but are regulated by their respective state governments.[26] Currently there are 43 recognised universities in Australia spread geographically along population lines in capital cities and the more densely populated regional centres. Of the 43 universities, 37 are public universities and there are six private universities. Universities can be further categorised as either Group of Eight (Gr-8), five Australian Technology Network (ATN), seven Innovative Research Universities (IRU) and six Regional University Network (RUN), with the remaining universities being classified as other including the six private universities.[27]

[26] 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 / amended by the New South Wales Government. Similarly, Melbourne University comes under the legislative jurisdiction of the Victorian State Government. Apart from three private universities (Australian Catholic University, Bond University, and Notre Dame), all other universities are created by state acts of parliament.

[27] See Appendix B for details of individual university affiliations.

Prior to 1973, university funding in Australia comprised Commonwealth funded places via scholarships and the charging of student fees. In 1973, with the election of the Whitlam Government, student fees were abolished and the Federal government assumed responsibility for university funding. Free university education led to increased student demand and a heavy cost burden on the Australian Government. In fact, in 1981, the federal government provided nearly 90% of university income.[28] In 1987, John Dawkins[29] (the Education Minister in the Hawke Labor Government) initiated reforms to tertiary education and its funding. These reforms led to the creation of larger universities (through consolidation of institutions) being able to cater to a larger student body and a reorganisation of funding. Tuition fees were introduced with students given the option to pay upfront fees to the university or utilise a loan system referred to as the Higher Education Contribution Scheme (HECS). Under HECS, the Australian Government provides student loans that are paid directly to the universities in addition to a government funded student subsidy. As a result, university funding for undergraduate programs became dependent on student numbers and were subject to student quotas for courses that were granted by the Federal Government to each institution. Overall, the reforms led to the transformation of Australian universities along commercial lines with universities being the suppliers of education products to students, who are now regarded as customers, (Clements, K.W. and Izan, Y.H., 2008; Soh, 2007).

Twenty years after the Dawkins reforms, the Bradley Review (2008) was established to investigate the structure, organisation and financing of higher education in Australia with the objective of increasing access and participation rates. This report concluded with forty six recommendations with the main focus being the setting of quantitative targets

[28] Dodd, T., "Who pays for Universities," *The Australian Financial Review, 18 Aug 2014*.
[29] Dawkins, J, "Higher Education: A policy Discussion Paper," Australian Government (December 1987); "Higher Education: a policy statement," Australian Government (July 1988)

for university graduates and the discontinuation of the quota system for university places in undergraduate courses. There were no restrictions on post-graduate numbers.[30] The outcomes of the Bradley Review (2008) have resulted in an increase in a fully funded student-demand-driven system[31] with universities being able to enrol full fee paying domestic students in the absence of a government funded place.

The increased student numbers, coupled with increased competition between universities for students, provided the foundations for the commercialisation of management practice and associated administrative structures of the university system. As market forces driven by student (customer) demand is a major contributor to university funding, University managerial philosophy and practice had to adapt to this new environmental setting. The reforms were aimed at improving effectiveness and efficiency by operating universities along commercial lines. In addition, by transferring costs to students via student fees, it enabled successive federal governments to reduce spending on the university sector.[32] As a consequence of these changes, Australian Government funding as a percentage of university income has reduced from 90% in 1981 to approximately 41% in 2012.[33]

The federal education minister in 2014, Christopher Pyne[34], intends to introduce a further reform package for higher education incorporating measures that further enhance the commercialisation of university operations. The reforms include an increase in tertiary education places by up to 80,000 students per year, elimination of the quota system for undergraduate studies, tuition subsidy cuts, the enabling of non-university private

[30] There are no restrictions on fees charged or the number of Post Graduate or International Student enrolments, Bradley et al., 2008.
[31] Hare, J. "Denise Bradley proud of surge in numbers," *The Australian,* January 16, 2013.
[32] Meyers, D., Australian Universities: A Portrait of Decline; AUPOD, www.australianunivesities.id.au; 2012
[33] Dodd, T., Who pays for Universities, *The Australian Financial Review, 18 Aug 2014*.
[34] 'Christopher Pyne's vision for higher education', https://www.pyneonline.com.au/media-centre/articles/op-ed-vision-for-higher-education; *The Sydney Morning Herald,* May 26, 2014.

providers to offer university level courses and fee deregulation. The objective of these reforms is to further reduce the federal government's contribution to university funding. Although these changes are yet to be implemented, it is clear that the deregulation of the sector has led to a more competitive, demand driven market based system.[35]

2.2 Job Description for VCs at Australian Universities

According to the University of Melbourne's 2012 Annual Report (page 18), it is stated that: "the Vice-Chancellor and Principal is the chief executive officer of the University ….. responsible for the effective management and administration of the University". In a recent advertisement for the position of Vice Chancellor at the Australian National University (ANU) under the heading of "The Role of Vice Chancellor" [36], it is stated (page 36): "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".

With respect to the job description for the position of VC at ANU, the first paragraph under the heading of the "Role of Vice Chancellor" on page 36 states in large print:

> "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."

Similarly the Annual Report for Melbourne University for 2012, under the heading of "Introduction and Overview" on page 6, the opening paragraph states:

[35] Withers, G., The solution for universities is more than just a simple boost for competition, Australian Financial Review, 18 August 2014.
[36] Australian National University, 2015. Appointment of Vice – Chancellor and President, Information for candidates.

> "Outstanding rankings for Melbourne in 2012 …. The University was ranked number 28 in the world, up nine places from 2011, according to the Times Higher Education World University Rankings, and number 57 in the world according to the Academic Rankings of World Universities Shanghai Jiao Tong, compared with 60 in 2011. Under both measures, the University of Melbourne stood out as the highest ranked university in Australia."

As the VC is responsible for the overall management and administration of the university and based on the emphasis placed on rankings, in both the job description as well as the annual report, it is not unreasonable to use rankings as a measure of university performance and by default the performance of the VC. Therefore, rankings are likely to be a factor to be considered in the determination of performance measures and targets for VCs. Additionally, rankings also serve as an independent, objectively determined, externally verifiable performance measure. Hence the use of ranking as a performance measure for the examination of the pay / performance relation for VCs of Australian universities.

2.3 Empirical evidence on VC's compensation

Prior research on VC and senior executive compensation in the university sector has been undertaken in Australia and internationally. Soh (2007) compares remuneration practices in Australia for University VCs to corporate sector CEOs. Using data for the period 1995-2002, she investigates the relation between size, as measured by revenues, and the variation in the remuneration of VCs as compared to the remuneration of CEOs. Based on the responsiveness of pay to institution size, the results indicate that an institution that is 10% larger will pays its VC approximately 2.7% more. In addition, the paper finds that VCs on average receive 56% less than CEOs of commercial organisation of a similar size.

Clements and Izan (2008) investigate the market for academic executives using the remuneration of the top five academic executives at Australian universities. Using data for the period 1999 – 2004 for 33 Australian universities, they find that institutional size is the dominant factor in the determination of academic executive remuneration. In addition, they find that over the five year period of the study "academic executive remuneration has increased at a rate almost twice that of teaching and research staff" (Clements and Izan, 2008, page 3).

In the United Kingdom, the only unregulated salary in the university sector is that of VCs. Baimbridge and Simpson (1996) attempt to model the 'financial remuneration' of VCs utilising 22 institutional and 18 personal explanatory variables for 64 universities between1993-94. They conclude that there is very little statistical evidence of significance supporting the 'reward levels' awarded to VCs.

An examination of the impact of the agency model on University President compensation is undertaken by Banker et al., (2009) in a study on "organisational complexity (based on firm size and diversification) and executive compensation (page 5)." The data used in the analysis includes 279 universities over a five year period, (2001-2002 to 2005-2006) giving 1,011 year observations. The key finding of the study is that, although high status universities offer greater pay to their presidents, the higher pay is not supported by performance measures. Using the agency model, this indicates that presidents of high stature universities obtain a better return on their ability but not their effort.

A recent US study by Parsons and Reitenga (2014) examines whether there is a return for compensating university presidents relatively more than their peers and whether a relation

exists between abnormal compensation[37] and subsequent performance when comparing public to private universities. Data for 164 universities comprising 84 public and 80 private universities for the period 2005-2006 and 2007-2008 were used for the analysis. Segmented periods were used to assess whether abnormal compensation in the 2005-2006 period impacted on performance in 2007-2008, thereby using a two year lag to measure performance. The results indicate that private university presidents who are paid relatively more than their peers improve student quality via higher SAT[38] scores and lower acceptance rates as well as being able to charge higher tuition fees in subsequent periods. However, the same results do not hold for the relation between abnormal compensation and future performance in public universities.

These prior studies utilise personal and institutional characteristics as performance measures to analyse VC compensation. The results show that institution size is the major factor impacting on VC (senior executive) compensation. This chapter differs in that the performance measures used are based on rankings provided by independent national and international agencies.[39]

2.4 Theory Development and Hypothesis

There are two alternative theoretical explanations for the pay-performance relation applicable to both the corporate and the public (university) sectors, (i) efficient contracting based on agency theory, (Jensen and Meckling, 1976) and (ii) managerial power (Bebchuk et al., 2002, 2003, 2006).

[37] Abnormal compensation is a residual resulting from the difference between the regression modelling of expected compensation and actual compensation paid to University Presidents.
[38] Scholastic Aptitude Test.
[39] Good Universities Guide, QS and ARWU rankings for the periods 2005 to 2012.

Agency theory suggests that executive compensation is based on optimal or efficient contracting between management (agent) and the owners (principals). Under the agency model, there is a separation of ownership from control that may result in managers maximising their own interest at the expense of the principals. Jensen and Meckling (1976, page 308) state that *"if both parties are utility maximisers there is reason to believe that the agent will not always act in the best interests of the principal."* The intention of optimal contracting is to align the objectives of managers with owners leading to a reduction in agency costs as well as to incentivise via performance-pay. In the corporate sector, this is achieved by the issue of ownership rights in the form of shares or share options as part of a compensation package, (Jensen and Murphy, 1990). That is, if managers are also owners, they should behave in a manner that is favourable to all owners, including themselves.

However, universities are significantly different from private firms in terms of ownership, governance structures and performance measures. In the absence of shareholders, the profit motive and an active market for ownership rights, the application of the optimal contracting approach under agency theory to VC compensation may be inappropriate.

An alternative view of executive compensation is the notion of managerial power, (Bebchuk and Fried, 2006, 2004, 2003). They assert that managers dominate their boards in order to negotiate their own employment agreements as well as effectively set their own pay. As Jensen and Meckling (1976) point out this may lead to a situation where managers are not acting in the best interests of the principal. Given the discretionary power of executive management; *"the greater the ... manager's power, the greater is their ability to extract rents ... subject to outrage costs"*, (Bebchuk and Fried, 2003, p

75). Under the managerial power approach, the CEO is in a position to wield significant influence over the operations of the board which enables the CEO to extract rents.

In the university setting, the VC (President) is the principal executive officer and he/she is appointed by and reports to the Council. The Council is the governing body of the university and one of its core functions is to appoint and monitor the performance of the Vice-Chancellor (President).

The objectives of the university and responsibilities of the senate[40] or council[41] are embedded in Statutes establishing the university. The composition of the council varies between universities and typically comprises: the Chancellor, Vice-Chancellor, chair of academic board, government appointed members, council appointed members and elected members representing the academic, administrative and student bodies of the university. Council size varies between universities and ranges between 11 and 22 members. The number of council meetings held per year by the Council varies across individual universities.[42] Further, the council is supported by a number of sub-committees (ranging from seven to 12) with some (not all) council members also sitting on various university sub-committees. As not all universities disclose the existence of a remuneration committee, future research may focus on the composition of members and the governance processes used to determine VC and senior executive compensation.

In the absence of an active principal and as a university is Commonwealth funded but state regulated, the only authority to which the VC is accountable is the university council.

[40] New South Wales Government, The University of Sydney Act 1989 refers to the Governing body of the university as the Senate.
[41] Victorian Government, The University of Melbourne Act 1989 and the University of Technology Act 1989 refer to the Governing body of the University as the Council.
[42] As per the Annual reports for the 2012 year, University of Melbourne held 12 council meetings, University of Sydney and University of Technology Sydney held 7 council meetings.

At the present time, the Statutory[43] responsibilities of the university council, apart from appointing and monitoring the performance of the VC, incorporate terms such as, "approving", "overseeing" and "monitoring" university activities and policies. The question arises as to whether the council is in a position to develop and administer VC compensation plans that provide high level performance goals benefiting all university participants or whether the VC compensation plans are the result of VC managerial power emanating from council capture.

The consideration of whether university governance structures are effective in aligning VC compensation to performance may be approached via optimal contracting (agency) theory (Jensen & Meckling, 1976) or capture theory, (Bebchuk and Fried, 2003). Given that council members: (i) are not remunerated for council membership, (ii) are either political, honorary or elected student and staff appointments with a limited tenure, (iii) have limited or no prior business administration experience at either the university level or within the private sector, (iv) meet a limited number of times per year, is suggestive of a governance structure which is more in line with capture theory.

Based on the above discussion, it is predicted that university management and, in particular, the VC, capture university councils and, hence my prediction is

H_1: *There is no relation between VC compensation (salary plus bonuses) and university performance.*

Accordingly, the next sections provide evidence on this.

[43] University of Melbourne Act 2009; University of Technology, Sydney Act 1989; University of Sydney Act, 2009.

3 Sample & Data

Evidence for this study is based on a sample of Australian universities for the years 2005 – 2012 inclusive. According to the Higher Education Support Act (HESA), 2003 there are a total of forty three accredited Higher Education Providers in Australia[44] *(see appendix B)*. After excluding small local specialist universities, international and private accredited universities[45] and universities that did not publish annual reports, the final sample comprised 37 universities.

Compensation data is hand collected from respective university annual reports. Observations where the remuneration report did not disclose ascertainable compensation details for the VCs are excluded. Finally, for those universities that changed their VC during or at the end of the year, 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 respectively (Coulton and Taylor, 2002).

Rankings data to be used as a proxy for performance were hand collected from 'The Good Universities Guide (GUG).[46] The GUG relates solely to Australian universities and provides ranking information for the 37 universities to be included in the analysis. After deletions for missing compensation, VC changes and rankings, the sample comprised 37 universities and 182 observations as per Table 1.

[44] Section 16-15 and 16-20; Australian Government Legislation, Higher Education Support Act, No 149, 2003 as amended

[45] Universities excluded comprised (i) Table A Provider – Bachelor Institute of Indigenous Tertiary Education; (ii) Table B Providers – Bond University, The University of Notre Dame and MCD University of Divinity; Table C Providers - Carnegie Mellon University and University College London.

[46] The Good Universities Guide is published in Australia by Hobsons and has been a continuous annual publication since 1991.

Table 1 - Sample Construction for the period 2005-2012.

		Universities	VCPay Observations
1.	Accredited Higher Education Providers	43	344
2.	Exclude International , Indigenous, Religious Higher Education Providers and non-publication of annual reports	6	-48
3.	37 Universities covering an 8 year period	37	296
4.	Add years with 2 or more VCs in the same year, yielding 2 Salary observations for a single period.		11
	Subtotal	37	307
5.	Exclude University years that did not provide VC's compensation Details.		-12
6.	Exclude Departing VC (in final year).		-37
7.	Exclude Incoming VC (in first year)		-36
8.	Exclude missing GUG ranking data		-40
	Final Sample size after exclusions ***(Universities & University years)***	**37**	**182**

As not all universities in the analysis have the same number of yearly observations, the data comprises an unbalanced panel data set. 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.

As the actual amount of compensation is often not reported, VC remuneration is obtained by taking the mid-point of the top band reported in the remuneration table contained in the notes to the accounts of the annual report. It is assumed that the VC is the highest paid executive. Remuneration disclosures vary substantially with respect to consistency and

quality and, although total remuneration paid to VCs is available in most instances, the composition of the remuneration being: salary, bonuses, superannuation benefits, termination or sign-on payments are not disclosed separately, contrary to requirements specified in the accounting standards[47].

Details of the performance measure used in the analysis are provided in Table 2.

Table 2 - Rankings data used as performance measures

University Rankings Criteria - Using Good Universities Guide		
	Total Observations	Final Sample where all 5 measures are available for VC compensation
Student Demand	252	182
Proportion age > 25	312	182
Graduate Starting Salary	301	182
Getting a Full-time Job	296	182
Positive Graduate Outcomes	298	182
Sum of Score = Total GUG Rating		182

GUG rankings comprise a total of 30 separate absolute measurements and use a one to five star rating in assessing performance. The analysis is based on the absolute measure of each of the five variables considered to be the most relevant for measuring VC performance. These GUG measures are: (i) Student Demand, (ii) Proportion Age > 25, (iii) Graduate Starting Salary, (iv) Getting a Full-time Job and (v) Positive Graduate Outcomes. The main variable used in the analysis comprised the sum of the above five measures referred to as TRankG in the analysis. As not all universities in the sample had rankings for the five measures for all eight years 2005 - 2012), an additional 40 VC

[47] Australian Accounting Standards Board - AASB124 - Related Party Transactions; Australian Accounting Standards Board - AASB 1046 Director and Executive Disclosures by Disclosing Entities - January 2004.

compensation observations had to be excluded from the analysis.[48] The justification for the use of these five measures is based on the utilisation of a combination of student characteristics and institution characteristics, both of which are strategic considerations for a VC.

The models used in the analysis incorporate performance variables comprising rankings data, economic controls to cater for size and institutional controls as a proxy for complexity. Performance measures include total rankings and change in rankings, as well as indicator variables signifying movements up or down in the total rankings.

Three separate size measures are used alternatively including, total EFTSL[49], Total Revenue[50] and Total Staff.[51] Institutional controls are used to represent organisation complexity and include International Student ratio,[52] the number of campuses and the number of faculties. The number of council members is also included as a control for institutional governance. For modelling changes in compensation, additional institutional measures comprising a Group of 8 (Gr-8) indicator variable and an indicator variable denoting the presence of a medical faculty (Medicine) are added to the model.

To reduce potential skewness, the natural logarithm of VC compensation and the economic size measures are used in the regression models.

The models used for the analysis of VC compensation are summarised as follows:

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[48] Sensitivity analysis is performed using two additional independent rankings obtained from QS World University Rankings and the Academic ranking of World Universities (ARWU). However, due to a number of Australian universities not being included in the international rankings, the sample size is reduced. This is because only 25 Australian universities achieved a ranking high enough to be included in the QS rankings and this reduced the number of university year observations to 125. For the ARWU rankings, only 21 Australian universities qualified providing 102 university years for analysis.

[49] EFTSL represents Equivalent Full Time Student Load as a measure of size.

[50] Total Revenue included all government funding, local and international student fees and all other income sources as disclosed in the income statement.

[51] Total staff includes the sum of academic and administrative staff.

[52] International Student ratio is a percentage calculated as total international student income ÷ total revenue.

$$\mathbf{LnVCPay_{it} = [(Performance) + (Economic\ Controls) + (Institutional\ Controls)]}$$

Changes in VC's compensation are modelled as:

$$\mathbf{\Delta LnVCPay_{it} = [(\Delta Performance) + (\Delta Economic\ Controls) + (Institutional\ Controls)]}$$

The variables used for the regression modelling are summarised in Table 3:

Table 3 - Variable names and definitions

Variable	Definition
Dependent Variable	
$lnVCPay_{it}$	Natural Log of Total VC Compensation
$\Delta lnVCPay_{it}$	Change in Natural Log of Total VC Compensation
Performance Measures	
$TRankG_{it}$	Sum of "selected"Good Univesity Guide Rankings *(See next)*
Selected GUG Rankings comprising $TRankG_{it}$	
ST_DemG_{it}	Student demand for the university
$Prop>25G_{it}$	Proportion of students aged greater than 25.
$Grad\_Start\_SalG_{it}$	Graduate starting salary
Get_Job_{it}	Ability to get a job.
$Pos\_Grad\_OutG_{it}$	Positive Graduate Outcomes
Changes in Performance Rankings	
$\Delta TRankG_{it}$	Change in sum of "selected" Good Uni Guide Rankings
DTRnkGDit	Dummy Indicator variable if the sum of ranking points Decreased
DTRnkGUit	Dummy Indicator variable if the sum of ranking points Increased
$TRankG_{it+1}$	Total GUG Ranking in t+1 period.
$TRankG_{it+2}$	Total GUG Ranking in t+2 period.
$TRankG_{it-1}$	Total GUG Ranking in t-1 period.
Economic (Size) Controls	
$lnTEFTSL_{it}$	Natural Log of Total EFTSL
$lnTREV_{it}$	Natural log Total Revenue from all sources
$lnTSTAFF_{it}$	Natural Log of Total Staff (Academic and Administrative)
Changes in (Size) Controls	
$\Delta lnTEFTSL_{it}$	Change in Natural Log of Total EFTSL
$\Delta lnTREV_{it}$	Change in Natural log Total Revenue all sources
$\Delta lnTSTAFF_{it}$	Change in Natural Log of Total Staff
Institutional (Complexity) Controls	
$Gr\text{-}8_{it}$	Indicator variable denoting a Group of 8 University
$Medicine_{it}$	Indicator variable denoting presence of a Medical Faculty
$INTSTUR_{it}$	International Student Income ÷ Total Revenue
$TCampus_{it}$	Number of Campuses
$TFaculties_{it}$	Number of Faculties
$TCouncil_{it}$	Number of council members
$ADStaffR_{it}$	Admin Staff Ratio = Admin Staff Numbers ÷ Total Staff
Changes Institutional Controls	
$\Delta INTSTUR_{it}$	Change in International Student Income ÷ Total Revenue
$\Delta TCampus_{it}$	Change in Number of Campuses
$\Delta TCouncil_{it}$	Change in number of council members
$\Delta TFaculties_{it}$	Change in Number of Faculties
$\Delta ADStaffR_{it}$	Change in Admin Staff Ratio

Descriptive statistics for the raw data and log transformed data are included in Panel A of Table 4. Panel B of Table 4 contains summary statistics for the changes in the variables.

Table 4 - Panel A – Descriptive Statistics – Raw and Logged Data

	Mean	Median	Std. Dev.	Minimum	Maximum	No. Obs
$VCPay_{it}$	668,455	630,000	211,075	255,000	1,562,500	182
$lnVCPay_{it}$	13.3667	13.3534	0.3027	12.4490	14.2618	182
$TRankG_{it}$	15.0220	15	3.714918	8	21	182
TREV ('000)	579,732	459,316	407,451	50,839	1,930,935	182
$lnTREV_{it}$	13.0371	13.0375	0.7035	10.8364	14.4735	182
$TEFTSL_{it}$	21,168	18,849	10,210	3,267	49,559	182
$lnTEFTSL_{it}$	9.8317	9.844187	0.5332	8.0916	10.8109	182
$TSTAFF_{it}$	2,853	2,343	1,930	394	8,814	182
$lnTSTAFF_{it}$	7.7437	7.7592	0.6618	5.9764	9.0841	182
$INTSTUR_{it}$	0.1674	0.1534	0.0787	0.0323	0.5218	182
$Medicine_{it}$	0.5165	1	0.5011	0	1	182
$Gr\text{-}8_{it}$	0.2308	0	0.4225	0	1	182
$TCouncil_{it}$	19.1429	19	2.4340	13	27	182
$TCcampus_{it}$	4.9121	4.5	2.7778	1	16	182
$TFaculties_{it}$	6.4890	6	3.3699	2	17	182

All variables are defined in Table 3.

Table 4 Panel B – Descriptive Statistics – Changes Log Data

	Mean	Median	Std. Dev.	Minimum	Maximum	No. Obs
$\Delta lnVCPay_{it}$	0.1005	0.0828	0.1715	(0.4475)	0.8580	146
$\Delta TRankG_{it}$	0.8630	0	2.5988	(4)	11	146
$\Delta lnTEFTSL_{it}$	0.0502	0.0469	0.0576	(0.2454)	0.2568	146
$\Delta lnTREV_{it}$	0.0896	0.0809	0.0869	(0.2101)	0.3759	146
$\Delta lnTSTAFF_{it}$	0.0276	0.0268	0.0666	(0.1758)	0.3125	146
$\Delta INTSTUR_{it}$	0.0016	0.0007	0.0211	(0.0706)	0.0794	146
$\Delta TCouncil_{it}$	(0.4863)	0	2.2353	-13	7	146
$\Delta TCampus_{it}$	(0.0205)	0	0.5567	-6	2	146
$\Delta TFaculties_{it}$	(0.0274)	0	0.9752	-6	6	146

All variable are defined in Table 3.

The average VC compensation *(VCPay)* for the period 2005-2012 is $668,455 with a standard deviation of $211,075. The highest paid VC for the period earned an annual salary of $1,562,500 and the minimum for the same period is $255,000. At the same time, VCcompensation growth *(ΔlnVCPay)* is approximately 10.57% per annum.[53] Total Rank as per the GUG data *(TRankG)*, with a possible maximum score of 25, has a mean of 15.02, with a maximum of 21 and a minimum of 8. The performance measure TRankG is an absolute measure calculated annually based on the sum of the five performance indicators deemed most relevant that have been extracted from Hobson's Good University Guide covering the period 2005 – 2012[54].The change in rank *(ΔTRankG)* is very small with a mean of 0.86 and a standard deviation of 2.60. The three size measures for changes in total revenue *(ΔlnTREV),* total EFTSL *(ΔlnTEFTSL)* and total staff *(ΔlnTSTAFF)* all show positive increases. However, the standard deviations for total revenues and changes is extreme and may not provide as reliable a proxy for size as the other two size controls. All other measures are as expected.

The correlations between the variables used in the regression equations are reported in Table 5. There exists a significant relationship (at the 5% level) between VC compensation *(LnVCPay)* and the GUG ranking *(TRankG)*. As expected, the size measures, comprising total EFTSL *(TEFTSL)*, total revenue *(TREV)* and total staff *(TSTAFF)* show high levels of correlation. As they are used independently of each other as economic size controls, there are no multicollinearity concerns. Apart from the size measures, no two variables with correlations exceeding 80% are used in the same regression model and as such do not pose multicollinearity concerns.

[53] The unlogged ΔlnVCPay (calculated as $e^{.1005}$) yields a 10.57% growth rate.
[54] The statistics relating to the calculation of TRankG are included in Appendix A, Table A13.

From the correlation matrix, although the association between VC compensation and GUG ranking *(TRankG)* (0.3388 Pearson, 0.3183 Spearman) is significant, it is not as large as the size measures For example, Total Revenue *(lnTREV)* (0.6594 Pearson, 0.6622 Spearman) demonstrate that university size[55] has a greater impact on VC compensation.

[55] Other size measures include Student load *(lnTEFTSL)* and total staff *(lnTSTAFF)* with correlation metrics of 0.5132 and 0.5645 respectively.

Table 5 – Pearson and *Spearman* Correlations Matrix – Log Data

	lnVCPay	TRankG	lnTREV	lnTEFTSL	lnTSTAFF	INTSTUR	TCouncil	TCampus	TFaculties
lnVCPay	1	*0.3183**	*0.6622**	*0.5219**	*0.5657**	*0.1606*	*0.1438*	*0.1300*	*0.3315**
TRankG	0.3388*	1	*0.3826**	*0.1978**	*0.3879**	*0.1187*	*0.1741**	*0.054*	*0.5050**
lnTREV	0.6594*	0.4150*	1	*0.8578**	*0.9562**	*0.2755**	*0.4849**	*0.2480**	*0.3745**
lnTEFTSL	0.5132*	0.2227*	0.8698*	1	*0.8328**	*0.4944**	*0.5022**	*0.2841**	*0.2618**
lnTSTAFF	0.5645*	0.4226*	0.9613*	0.8566*	1	*0.1481*	*0.4730**	*0.2425**	*0.3995**
INTSTUR	0.1349	0.1576	0.1672	0.3699*	0.0558	1	*0.2088**	*0.0411*	*-0.0206*
TCouncil	0.1122	0.1289	0.4596*	0.4735*	0.4584*	0.1508	1	*0.116*	*0.1165*
TCampus	0.1088	0.0674	0.2757*	0.2872*	0.2550*	0.1127	0.1662	1	*0.1565*
TFaculties	0.3082*	0.4811*	0.4835*	0.3483*	0.4919*	-0.0487	0.1949*	0.2811*	1

** Significant at the 5% level*

3.1 Experimental Design

The hypothesis is tested using a series of pooled panel data regressions as detailed below.

Details of the complete regression models are as follows:

Model 1: $\mathbf{lnVCPay_{it} = \alpha_0 + \beta_1 TRankG_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + \beta_6 TFaculties_{it} + \varepsilon_i}$

Model 2: $\mathbf{lnVCPay_{it} = \alpha_0 + \beta_1 \Delta TRankG_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + \beta_6 TFaculties_{it} + \varepsilon_i}$

Model 3: $\mathbf{lnVCPay_{it} = \alpha_0 + \beta_1 DTRnkGU_{it} + \beta_2 DTRnkGD_{it} + \beta_3 lnSIZE_{it} + \beta_4 INTSTUR_{it} + \beta_5 TCouncil_{it} + \beta_6 TCampus_{it} + \beta_7 TFaculties_{it} + \varepsilon_i}$

The difference in these models relates to the performance measures used, being (i) the sum of the five performance measures giving total rank *(TRankG);* (ii) the change in the sum of total rank *(ΔTRankG)* and (iii) the use of two (2) indicator variables, with the first measuring an increase in the sum of total rank *(DTRnkGU)* and the second measuring a decrease in the sum of total rank *(DTRnkGD).*

For each of the above models, three separate measures for the economic controls relating to size are utilised alternately. The three measures are Total Revenue *(lnTREV),* Total EFTSL *(lnTEFTSL)* and total staff *(lnTStaff)*. Institutional controls comprise: international student income ratio *(INSTUR)*, total council members *(TCouncil)*, number of campuses *(TCampus)*, and number of faculties *(TFaculties).*[56] The results generated using panel data regression for models 1 to 3 are presented in Table 6.

[56] The Hausman test is used to determine whether Fixed Effects *(FE)* or Random Effects *(RE)* regressions are to be applied to the panel data regression models. The results from the Hausman test confirmed the use of Fixed Effects where only the variables that change over time are included. As such, the time invariant variables being Gr-8 and medical faculty universities are excluded from regressions model (1) - 4.

In order to test whether the five individual performance measures that comprise the total rank score *(TRankG)* individually have any impact on VC compensation, the following model is used:

Model 4: $$\mathbf{lnVCPay_{it} = \alpha_0 + \beta_1 ST\_DemG_{it} + \beta_2 Prop{>}25G_{it} + \beta_3 Grad\_Start\_SalG_{it} + \beta_4 Get\_JobG_{it} + \beta_5 Pos\_Grad\_OutG_{it} + \beta_6 lnSIZE_{it} + \beta_7 INTSTUR_{it} + \beta_8 TCouncil_{it} + \beta_9 TCampus_{it} + \beta_{10} TFaculties_{it} + \varepsilon_i}$$

For the above model, three separate size measures are used generating three separate regression results using Total Revenue *(lnTREV),* Total EFTSL *(lnTEFTSL)* and total staff *(lnTStaff)*. The results are presented in Table 7.

Finally, to assess whether the change in VC compensation *(ΔlnVCPay)* may be explained by a change in total rank *(ΔTRankG)* or change in size *(ΔlnTREV)*, *(ΔlnTEFTSL), (ΔlnTStaff,)* or a change in international student income ratio *(ΔINTSTUR,)* the following model is used. This model also introduces two additional institutional controls being group of eight *(Gr-8)* and the presence of a medical faculty *(medicine)*. These institutional controls remain constant between 2005 and 2012 and based on the results of the Hausman test, Random Effects (RE) regression are to be used for this model.

Model 5: $$\mathbf{\Delta lnVCPay_{it} = \alpha_0 + \beta_1 \Delta TRankG_{it} + \beta_2 \Delta lnSIZE_{it} + \beta_3 \Delta INTSTUR_{it} + \beta_4 Medicine_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 \Delta TCouncil_{it} + \beta_7 \Delta TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i}$$

For the above model, three separate measures for size are utilised, being changes in total revenue *(ΔlnTREV),* change in total EFTSL *(ΔTlnEFTSL),* and change in total staff *(ΔlnTStaff)*. The results are presented in Table 8.

4 Main Results

4.1 Main Results based on the Aggregate GUG Rankings

Table 6 reports the results of the regressions for Models (1), (2) and (3) detailing the impact on VC compensation of (i) the aggregate or total of the performance measures *(TRankG)* utilised *(Model 1, Columns 1-3)*, (ii) the change in total of the performance measure *(ΔTRankG) (Model 2, Columns 4-6)* and (iii) change in performance as denoted by movements up *(DTRnkU)* and down *(DTRnkD)* in the sum of the annual performance measures *(Model 3, Columns 7-9)*. The dependent variable in each case is the log of VC compensation *(lnVCPay)* pay. In all cases, the use of Fixed Effects (FE) with robust standard errors are applied to the panel data regressions. The use of FE precluded the inclusion of field identifiers such as Gr-8 and those with a medical faculty as these are time invariant measures.

Table 6 - Regressions results for Models 1, 2 & 3 - Evaluating VC's compensation

Model 1: $lnVCPay_{it} = \alpha_0 + \beta_1 TRankG_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + \beta_6 TFaculties_{it} + \varepsilon_i$

Model 2: $lnVCPay_{it} = \alpha_0 + \beta_1 \Delta TRankG_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + \beta_6 TFaculties_{it} + \varepsilon_i$

Model 3: $lnVCPay_{it} = \alpha_0 + \beta_1 DTRnkGU_{it} + \beta_2 DTRnkGD_{it} + \beta_3 lnSIZE_{it} + \beta_4 INTSTUR_{it} + \beta_5 TCouncil_{it} + \beta_6 TCampus_{it} + \beta_7 TFaculties_{it} + \varepsilon_i$

		Model 1 - Total Rank Scores			*Model 2 - Change in Total Rank*			*Model 3 - Rank Score UP or Down*		
		1	2	3	4	5	6	7	8	9
Dependant Variable lnVCPay	**Predicted Sign**	**Total GUG Points Rank using Log Total REVENUE as size control**	**Total GUG Points Rank using Log Total EFTSL size control**	**Total GUG Points Rank using Log Total STAFF as size control**	**Change in Total GUG Rank using Log Total REVEUE as size control size**	**Change in Total GUG Rank using Log Total EFTSL as size control**	**Change in Total GUG Rank using Log Total STAFF size control**	**Movement in GUG Points UP-DOWN using Log Total REVENUE as size control**	**Movement in GUG Points UP-DOWN using Log Total EFTSL as size control**	**Movement in GUG Points UP-DOWN using Log Total STAFF as size control**
		β / *t-stat*	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***
TRankG	+	0.003	0.000	0.004						
		(0.310)	*-(0.030)*	*(0.320)*						
ΔTRankG	+ / -				-0.002	-0.002	-0.002			
					-(0.310)	-(0.350)	-(0.280)			
DTRnkGU	+							0.009	0.044	0.090**
								(0.320)	(1.350)	(2.540)
DTRnkGD	-							0.015	0.040	0.082**
								(0.500)	(1.220)	(2.390)
SIZE	+	0.781***	1.353***	1.349***	0.699***	1.223***	1.423***	0.775***	1.323***	1.340***
		(15.430)	*(9.080)*	*(7.330)*	(9.190)	(8.390)	(8.080)	(14.730)	(8.600)	(6.920)
INTSTUR	+	0.932	-0.797	1.201	0.768	-0.974	0.621	0.925	-0.898	0.861
		(1.430)	*-(0.850)*	*-(1.310)*	(1.290)	-(1.500)	(0.960)	(1.530)	-(1.050)	(1.110)
TCouncil	-	0.000	-0.010	-0.023*	0.008	0.010	0.007	0.000	-0.009	0.019
		-(0.010)	*-(0.750)*	*-(1.690)*	(0.790)	(0.840)	(0.570)	(0.000)	-(0.670)	-(1.600)
TCampus	+ / -	-0.025	-0.045*	-0.057**	0.011	0.035	0.016	-0.025	-0.043*	-0.051*
		-(1.290)	*-(1.920)*	*-(2.120)*	(0.280)	(0.860)	(0.440)	-(1.240)	-(1.790)	-(1.890)
TFaculties	+	-0.010	-0.010	-0.010	-0.010	-0.006	-0.012	-0.009	-0.008	-0.005
		-(0.800)	*-(0.630)*	*-(0.500)*	-(1.320)	-(0.320)	-(0.990)	-(0.710)	-(0.510)	-(0.280)
Constant		3.178***	0.687	3.447**	3.996***	1.214	2.153	3.280***	0.920	3.452**
		(4.680)	*(0.440)*	*(2.390)*	(4.130)	(0.830)	(1.630)	(4.630)	(0.580)	(2.260)
Adjusted R^2		0.597	0.536	0.415	0.438	0.412	0.411	0.595	0.540	0.444
F		47.120***	18.110***	10.670***	24.110***	12.520***	13.740***	44.400***	23.950***	9.000***
Number of Observations		182	182	182	146	146	146	182	182	182
Fixed Effects		√	√	√	√	√	√	√	√	√

*T-statistics using robust standard errors are listed below the coefficient estimates. *, **, & *** indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*

All variables are defined in Table 3.

Model (1) employs the total GUG rank score as a performance measure *(TRankG)*, coupled with economic controls as indicated by size[57] metrics and institutional measures[58], to investigate its impact on VC compensation. The adjusted R-squared of the regressions varies between 41.5% and 59.7%, indicating reasonable explanatory power of the models. The results for the *F* statistic are 10.67, 18.11 and 47.12 for regressions 1 - 3 respectively and support the statistical significance of the model. The GUG ranking *(TRankG)* is not significant with any of the three size measures providing evidence on the lack of a relation between this performance measure and VC compensation.

The results confirm findings in prior studies (Clements and Izan, 2008; Soh, 2007) that larger universities pay their VCs more. The size variables for model (1), regressions 1-3 are statistically significant[59] when using the sum of rankings *(TRankG)* as the performance measure. In each case, their impact on VC compensation indicates that for each additional percentage point increase in the size measure, VC compensation increases by 0.781% of total revenue, 1.353% for an additional EFTSL unit and 1.349% for an additional staff member. To measure the economic significance of the size measures on VCs' pay, the size coefficients are applied to mean and median statistics reported in Table 4, Panel A. The results for a 1% change in the size measures increase VC compensation, depending upon which size measure is used, between $43 and $901.[60]

[57] Size being measured by either total revenue *(lnTRev)* total EFTSl *(LnTEFTSL)* or total staff *(lnTStaff,).*
[58] Institutional variables include *INSTUR, TCouncil, TCampus* and *TFaculties.*
[59] At the 1% level.
[60] To discover the economic impact of these results, the growth rates are applied to the mean and median values for VC pay. The results are that for a $1 million increase in total revenue *(lnTREV)*, mean VC pay increases by approximately, $901 (median $1,071). For each additional unit increase in EFTSL *(lnTEFTSL),* mean VC Pay increases by$43 (median $45). For each additional staff member *(lnTSTAFF),* mean VC Pay increases by $316 (median $363). Results obtained by applying the logarithmic regression generated growth rates to the mean and median figures for *TREV, TEFTSL, TSTAFF* as per Table 4 - Panel A, with the regression forecast of increase in VC Pay being scaled by $millions for total revenue, and per unit of EFTSL and STAFF.

The only other indicator variable that appears to affect VC compensation is the number of campuses *(TCampus),* which is a proxy for organisational complexity. However, the coefficient for this variable is negative **(-0.057)** in model (1), Column 3, indicating that an increase in the number of campuses decreases VC compensation. This result is counter intuitive, as common sense dictates that if the number of campuses is a proxy for organisational complexity, more complex organisations usually lead to higher VC compensation. Alternatively, this may be due to regional and non-G8 universities covering a larger geographic area resulting in a greater number of campus sites. Expectedly, the VC compensation is lower for these second tier universities, hence the (+/-) predictor. Further, as *TCampus* is significant in only one of nine regressions, it is not indicative of a reliable predictor of VC's compensation.

Model (2) results are reported in Table 6, Columns 4 to 6. This model incorporates the change in each performance measure *(ΔTRankG),* coupled with the economic and institutional measures as outlined previously. The adjusted R-squared of the regressions varies between 41.1% and 43.8% indicating reasonable explanatory power of the models. The results for the *F* statistics ranging from 13.74 to 24.11 also support the statistical significance of the model. Once again, the ranking measure *(ΔTRankG)* is not significant with any of the three size measures providing further evidence of the absence of a relation between rankings as a performance measure and VC compensation.

As for model (1), the only explanatory variables that significantly impact positively on VC compensation are the different size measures (*lnTREV, lnTEFTSL* and *lnTSTAFF*). In each case, their impact on VC compensation disclosed that, for each additional percentage point increase in the size measure, VC compensation increases by 0.699% of total revenue, 1.223% for an additional EFTSL unit and 1.423% for an additional staff

member. All other explanatory variables including the change performance measure *(ΔTRankG)* are not statistically significant.

The results for model (3), Columns 7 to 9 in Table 6, report the impact on VC compensation by incorporating two indicator variables[61] being an increase *(DTRnkU)* or decrease *(DTRnkD)* in the total rank score in successive years as proxies for performance measures in addition to the economic (size) and institutional controls used previously. The adjusted R-squared of the regressions varies between 44.4% and 59.5% indicating reasonable explanatory power of the models. The results for the *F* statistics ranging from 9.00 to 44.4 also confirm that the variables used in the regression are significantly different from zero. The most notable outcome from model (3), Column 9, is that both dummy variables measuring performance, being increase *(DTRnkU - coefficient = 0.090, t = 2.54)* or decrease *(DTRnkD coefficient = 0.082, t = 2.39)* in year on year ranks are both positive and statistically significant. This result is indicative of the base VC compensation increasing irrespective of whether performance as measured by rankings' increases or decreases. However, this only occurred in one of three separate regressions, hence its robustness may be questioned. On the other hand, average annual VC compensation increases between 2005 and 2012 were approximately 11%, which would signify VC compensation increasing irrespective of rankings. All other institutional explanatory variables are not statistically significant.

Once again the only explanatory variables that significantly[62] impact positively on VC compensation are the different size measures.[63] The economic significance of these

[61] In order to overcome any issues of multicollinearity with the use of dummy variables, three options are possible with regards to ranking point changes, namely increase, decrease or no change. It was decided to include the increases and decreases and omit the no change option.
[62] At the 0.1% level.
[63] The economic impact of the three size measures on VC Pay, are similar in magnitude to Model (1) results. For example, a 1% increase in total revenue *(TREV)* result in 0.775% increase in VC Pay, which results in

measures on VC compensation disclose that, for each additional percentage point increase in the size measure, VC compensation increases by 0.775% of total revenue, 1.323% for an additional EFTSL unit and 1.34% for an additional staff member.

4.2 Main Results based on the Individual GUG Rankings

Table 7 reports the results for the regression models including the individual GUG rankings that comprise the total GUG ranking measure as reported in section 4.1 results.

In addition to the economic and institutional controls, the five (5) individual ranking measures that are considered to have the largest impact on VC performance are included. The performance measures used include (i) student demand, (ii) proportion of students aged over 25, (iii) graduate starting salary, (iv) ability to get a job and (v) positive graduate outcomes. The dependent variable is the log of VC compensation.

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an increase of $893 for each additional $million increase in revenue *(under Model (1)and (2)the coefficient is 0.781% and 0.699% with the economic impact being $901 and $806 respectively for each additional $million in total revenue).* A 1% increase in *TEFTSL* resulted in a 1.323% and increases VC Pay by $39 for a one unit increase in EFTSL (*under Model (1) and (2) the TEFTSL coefficients are 1.353% and 1.223% with the economic impact being $43 and $39 for an additional EFTSL unit).* A 1% increase in *TSTAFF* resulted in a 1.34% increase in VC Pay resulting in an increase of $314 increase in VC pay for a one unit increase in TSTAFF (*under Model (1)and 2, the coefficients are 1.349% and 1.423% and the economic impact is $316 and $333 for an additional staff member).*

Table 7 - Regression using individual performance measures

Model 4: $\ln VCPay_{it} = \alpha_0 + \beta_1 ST\_DemG_{it} + \beta_2 Prop{>}25G_{it} + \beta_3 Grad\_Start\_SalG_{it} + \beta_4 Get\_JobG_{it} + \beta_5 Pos\_Grad\_OutG_{it} + \beta_6 lnSIZE_{it} + \beta_7 INTSTUR_{it} + \beta_8 TCouncil_{it} + \beta_9 TCampus_{it} + \beta_{10} TFaculties_{it} + \varepsilon_i$

Dependant Variable lnVCPay	Predicted Sign	1	2	3
		Individual Ranking Measures using Log Total Revenue as size control	Individual Ranking Measures using Log Total EFTSL as size control	Individual Ranking Measures using Log Total Staff as size control
		β / *t-stat*	**β / *t-stat***	**β / *t-stat***
ST_DemG	+	-0.006	-0.013	-0.005
		-(0.179)	*-(0.364)*	*-(0.124)*
Prop>25G	+	0.035	0.017	0.010
		(0.766)	*(0.351)*	*(0.167)*
Grad_Start_SalG	+	-0.017	0.001	-0.019
		-(0.682)	*(0.048)*	*-(0.710)*
Get_Job	+	0.029*	0.029	0.026
		(1.714)	*(1.490)*	*(1.278)*
Pos_Grad_OutG	+	-0.022	-0.036	-0.012
		-(0.865)	*-(1.225)*	*-(0.366)*
LnSIZE	+	0.774***	1.343***	1.339***
		(16.510)	*(8.931)*	*(7.376)*
INTSTUR	+	1.038*	-0.657	1.277
		(1.726)	*-(0.795)*	*(1.434)*
TCouncil	?	-0.001	-0.011	-0.023*
		-(0.129)	*-(0.900)*	*-(1.702)*
TCampus	+ / -	-0.023	-0.049**	-0.053**
		-(1.333)	*-(2.212)*	*-(2.010)*
TFaculties	+	-0.010	-0.008	-0.011
		-(0.830)	*-(0.530)*	*-(0.559)*
Constant		*3.248****	*0.793*	3.560***
		(5.070)	*(0.500)*	*(2.590)*
AR-sqr		0.596	0.533	0.408
F		37.746***	14.971***	10.163***
Number of Observations		182	182	182
Fixed Effects		FE	FE	FE

*T-statistics using robust standard errors are listed below the coefficient estimates. *, **, & *** indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*

The adjusted R-squared of the regressions varies between 40.8% and 59.6% indicating reasonable explanatory power of the models. The *F* statistics for the three regressions confirm the overall significance of the models. The results show that not one of the five individual ranking measures included in the model return a significant result. Once again, the results confirm that there is no statistical evidence supporting the existence of a relation between rankings used as a performance measure and VC compensation. However, once again all three regression models indicate that the economic indicators relating to size significantly explain the movements in VC compensation.

Apart from the economic controls relating to the size, the only other significant explanatory variables impacting on VC compensation are total campus *(TCampus)*, international student revenues *(INSTUR)* and size of the university council *(TCouncil)*. *TCampus*[64] as in model (1), has a negative impact on VC compensation when regressed with EFTSL as the size measure. This may be due to regional and non-G8 universities having a greater number of campuses and VC compensation being lower at these universities. However, *TCampus* returns a significant result in only two of three regressions and at the 5% level, it does not make it a reliable predictor of VC compensation. The contribution of international students to revenues *(INSTUR)* also returns a positive significant result (at the 10% level) on a single occasion. The size of the university council *(TCouncil)* returned a negative significant result (at the 10% level) on one occasion indicating that an increase in council membership has a negative impact on VC compensation. Apart from size, there is very little evidence linking performance, governance and institutional controls to VC compensation.

[64] *TCampus* is a measure of organizational complexity and is significant at the 5% level with EFTSL being the size measure. The negative result for this measure is counterintuitive as it would be expected that the more complex the organization, the higher would be the executive pay.

4.3 Main Results based on Changes (Δ) for both Dependent and Independent variables

Table 8 reports the results for model (5) utilising the changes in the three size measures separately and incorporating the annual changes for both the dependent and independent variables between the years 2005 and 2012. The model utilised random effects[65] for the panel data regressions, thereby enabling the inclusion of those universities that have a time invariant indicator variable, being medical faculty *(Medicine)* and belonging to the group of eight *(Gr-8)*. For Model (5), the R-squared ranges between 5.08% and 6.71% indicating that he model has fairly weak explanatory power. The Wald chi^2 numbers confirm that the variables used in this model are not significantly different from zero (cannot reject the null hypothesis).

[65] The use of random effects regression is confirmed by the application of the Hausman test (Greene, 2008) and, to control for heteroscedasticity, robust standard errors are determined.

Table 8 - Regression using changes in VC's compensation, size and institutional controls

Model 5: $\Delta lnVCPay_{it} = \alpha_0 + \beta_1 \Delta TRankG_{it} + \beta_2 \Delta lnSIZE_{it} + \beta_3 \Delta INTSTUR_{it} + \beta_4 Medicine_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 \Delta TCouncil_{it} + \beta_7 \Delta TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$

		1	2	3
Dependant Variable lnVCPay	**Predicted Sign**	**Impact of changes using ΔLog Total REVENUE as size control**	**Impact of changes using ΔLog Total EFTSL as size control**	**Impact of changes using ΔLog Total STAFF as size control**
		β / *z-score*	**β / *z-score***	**β / *z-score***
ΔTRankG	+	-0.001	-0.001	-0.002
		-(0.192)	*-(0.216)*	*-(0.330)*
ΔlnSIZE	+	0.014	0.053	0.336
		(0.050)	*(0.150)*	*(0.900)*
ΔINTSTUR	+	1.660*	1.591*	1.730**
		(1.790)	*(1.810)*	*(2.090)*
Medicine	+	-0.015	-0.015	-0.019
		-(0.600)	*-(0.600)*	*-(0.780)*
Gr-8	+	0.011	0.012	0.009
		(0.280)	*(0.300)*	*(0.240)*
ΔTCouncil	+ / -	0.002	0.002	0.001
		(0.410)	*(0.390)*	*(0.310)*
ΔTCampus	+ / -	-0.017	-0.017	-0.023*
		-(1.220)	*-(1.250)*	*-(1.700)*
ΔTFaculties	+	0.018	0.019	0.019
		(1.340)	*(1.320)*	*(1.430)*
Constant	+	0.104***	0.102***	0.098***
		(3.930)	*(5.500)*	*(6.580)*
R^2 *(overall)*		0.0508	0.0511	0.0671
Wald chi^2 (8)		11.940	12.360	12.660
Number of Observations		146	146	146
Random Effects		*RE*	*RE*	*RE*

Z-score robust standard errors are listed below the coefficient estimates.
, **, & * indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*

All variables are defined in Table 3.

The significance of the coefficient of the Constant indicates that, although there were significant increases in VC compensation between 2005 and 2012, the changes cannot be

explained by changes in performance, as measured by rankings, nor as measured by the changes in economic size or institutional controls. Hence, it can be concluded, that irrespective of the change in performance (rankings), institutional size or complexity the pay of VCs is increasing annually between 9.8% and 10.4% annually over the period 2005 - 2012.

The results for Model (5) also disclose that the change in the international student ratio *ΔINSTUR (being the change in the ratio of international student income to total revenue)* has a positive and statistically significant impact on the movement in VC compensation *(at the 5% and 10% level)*. This result only confirms that university reputation positively impacts on international enrolments that have a flow on to revenue measures. The change in the number of campus locations *(ΔTCampus)* had a negative significant effect on changes in VC compensation. Nevertheless, given the low explanatory power of the model overall, this does not provide strong support for these variables to be used as reliable predictors for changes in VC compensation. Further, the non-significance of the inclusion of universities classified as Gr-8 or containing medical faculties indicates that VC compensation is rising industry wide with the rises not confined to the major universities.

In the preceding analysis, the performance measures provided by the GUG rankings between 2005 and 2012 do not provide evidence supporting movements in VC compensation being driven by performance as measured by rankings. In fact, although not statistically conclusive, the results provide evidence that VC compensation increased irrespective of whether the rankings increased or decreased year on year. In the absence of exogenous explanatory performance indicators, the abnormal growth of VC compensation, when compared to the growth in earnings of academics in general, is best

explained by the concept of managerial power. Consequently, the bigger the institution, the larger the VCs compensation as evidenced by the significance of the economic controls associated with size. The results of Models (1), (2), (3) and (4) confirm that size, as measured by total revenue, total student numbers and total staff, are the main drivers of VC compensation.

5 Sensitivity Analysis

5.1 Alternative Performance Measures

Sensitivity tests using the same economic and institutional characteristics but utilising different ranking performance measures are undertaken. The additional performance measures comprised rankings provided by two independent international university ranking agencies namely, namely QS Worldwide University Rankings (QS)[66] and the Academic Ranking of World Universities (ARWU)[67].

One major difference between the rankings data is that there are 38 universities included in the GUG rankings data for the main results whereas only 24 and 21 Australian universities are included in the international QS and ARWU rankings respectively. Hence, the sensitivity analysis is biased towards the larger, more reputable universities.

The variables used for the sensitivity analysis are included in Appendix A, labelled as tables A1 and A2.

5.1.1 Model 1 results based on QS & ARWU Alternative Performance Measures

The findings reported in section 4, for Model (1) are replicated using both the QS and ARWU data with the results detailed in Appendix A, Table A3. The adjusted R-squared

[66] QS Quacquarelli Symonds Limited (2005 – 2012).
[67] ShanghaiRanking Consultancy, Academic Ranking of World Universities (ARWU).

of the regressions varies between 34.3% and 43.6% and, coupled with the *F* statistics *(ranging from 9.80 to 22.56),* is consistent with the main test results. The results indicate that only on two occasions out of six regressions is the ranking variable significant (Table A3, Columns 4 and 6 - only for the ARWU rankings). Given this finding, it is reasonable to conclude overall that there is no association between VC compensation and rankings. Accordingly, for both sets of ranking data, the regression results mirror the findings using the GUG rankings, that there is little evidence of a relation between rankings as a performance measure and VC compensation.

Apart from the size measures being significant in all instances, there is no consistency in the significance of the other explanatory variables.

5.1.2 Model 2 results based on QS & ARWU Alternative Performance Measures

Model (2) results using the QS and ARWU rankings data are reported in Table A4. The adjusted R-squared *(ranged from 19% to 31.9%)* and *F* statistics *(ranging from 16.36 to 54.59)* provide sufficient evidence of the explanatory power of the models and are consistent with the main test results.

The rankings' change performance measure *ΔlnPtsARWU* was significant (at the 5% level) on two occasions, however, on both occasions, it had a negative impact on VC compensation. The results indicate that rankings as a performance measure do not explain the level or increases in VC compensation.

The results confirm the significance, magnitude and economic impact of the size measures on VC compensation in all six regressions. This is consistent with the results reported in Section 4.1, Table 6 using the GUG rankings. The only other significant results are (i) the number of faculties *(TFaculties)* and (ii) number of campuses *(TCampus)*. Total faculties returns a negative coefficient in four from six regressions

ranging from -0.020 to -0.036%. This result is counterintuitive as it would be expected that the greater the number of faculties, the more complex the administrative structure resulting in a positive, not negative, impact on VC compensation. Alternately, more faculties require more Deans and associated administrative structures, thereby reducing the amount available for VC compensation. Total campuses was only significant on two from six regressions and had a positive impact on VC Compensation.

5.1.3 Model 3 results based on QS & ARWU Alternative Performance Measures

Model (3) results using the QS and ARWU rankings data are reported in Table A5 and Table A6. Table A5 reports the impact of the indicator variables moving up or down based on the movement in total ranking points[68], year on year, whereas Table A6 reports the impact of the dummy variables based on movement up or down in the overall rank position[69]. The adjusted R-squared *(ranged from 32.8% to 43.2%)* and *F* statistics *(ranging from 8.20 to 24.48)* provide reasonable support for the explanatory power of the models and are consistent with the main test results.

Only on one occasion in twelve regressions did a ranking dummy performance variable return a significant result. This occurred with ARWU overall rank position data with total staff as the size measure and resulted in a positive coefficient of 0.067 (at the 5% level), thereby supporting the increase in VC compensation for a movement upwards in the country rank. However, as this performance measure returned a significant result in only one of twelve regressions, the results do not provide robust evidence supporting the relation between rankings as a performance measure and VC compensation.

[68] QS and ARWU rankings provide a point score which may increase or decrease in successive years for each University.
[69] QS and ARWU also provide an overall rank position for the top 500 Universities.

Once again, the results confirmed the significance, magnitude and economic impact of the size measures on VC compensation in all twelve regressions. This is consistent with the results reported in Section 4.1, Table 6 using the GUG rankings. The only other significant explanatory variables include (i) the international student ratio *(INSTUR),* which had a positive impact on VC compensation on five occasions, (ii) the number of campuses *(TCampus),* which is a proxy for organisational complexity and whose impact on VC compensation was negative on two occasions, and (iii) Size of Council *(TCouncil),* which had a positive significant result on VC compensation on two occasions.

5.1.4 Model 4 results based on QS & ARWU Alternative Performance Measures

Model (4) results using the QS and ARWU rankings data are reported in Table A7. The adjusted R-squared *(ranged from 36.9% to 44.8%)* and *F* statistics *(ranging from 12.15 to 813.83)* provide reasonable explanatory power of the models and are consistent with the main test results. There are six separate ranking measures with the QS data and six separate ranking measures for the ARWU data. Only on two occasions did an individual ranking measure prove to be significant. This related to international faculty *(score_intfac_qs)* returning a result of 0.004 (at the 5% level) in Table A7, Column three signifying that the presence of international faculty members impacts positively on VC compensation. The other significant explanatory variable was the per capita academic performance *(score_pcp_arwu$_{it}$)* with a positive impact on VC compensation on two occasions. As there were only three out of 12 individual ranking performance measures in six separate regression models with a positive result, the findings do not support the notion that rankings used as a performance measure support current levels or increases in VC compensation. Consistent with the results reported in section 4.2, (i) all size measures

prove to be significant *(at the 1% level)* and (ii) *TCouncil*[70]*, TCampus*[71] and *INSTUR*[72] provide inconclusive significant results impacting on VC compensation.

5.1.5 Model 5 results based on QS & ARWU Alternative Performance Measures

Model (5) results using the QS and ARWU rankings data are reported in Table A8. As per the main test, this model utilises random effects[73] for the panel data regressions enabling the inclusion of universities with a medical faculty and belonging to the group of eight *(Gr-8)*. Consistent with the main test results for Model (5), the R-squared ranges between 5.70% and 8.88% indicating that the model has fairly weak explanatory power. The low Wald Chi^2 (8) on 5 out of 6 regressions *(ranging from 10.46 to 24.33 significant at 5%)* does not provide strong support for the statistical significance of this model.

The statistical significance of the coefficient of the constant, confirm the fact that VC compensation increases (ranging from 6.5% to 11.5%) between 2005 and 2012 are consistent with the main test results. There is no support that changes in performance, as measured by rankings, impact on changes in VC compensation *(ΔlnVCPay)*. Consistent with the main test results, except for Δ*INSTUR*[74] on a single occasion having a positive impact on the change in VC compensation, none of the other size or institutional changes impacted on changes in VC compensation.

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[70] *TCouncil* is significant at the 5% level impacting positively on VC pay, providing weak evidence for the notion that larger councils pay more to their VCs.
[71] *TCampus* is significant at the 10% level on one occasion and had a negative impact on VC compensation.
[72] *INSTUR* on a single occasion returns a positive significant result at the 10% level.
[73] The use of random effects regression is confirmed by the application of the Hausman test (Greene, 2008) and to control for heteroscedasticity, robust standard errors are determined.
[74] This result is applicable when the international student ratio *(ΔINTSTUR)* is regressed with the change in total staff *(ΔlnTSTAFF)* using the ARWU data. This also mirrors the main results as shown in Table 8 Column (3).

5.2 The Association between Current VC Compensation and Future Rankings

Additional sensitivity tests are performed using the rankings data from GUG, QS and ARWU as the dependent variables. The intention is to investigate whether VC compensation used as an explanatory variable impacts on future rankings. Model (1) is tested using (i) next year's rankings *(t + 1)*, and (ii) rankings two years ahead *(t + 2) (to evaluate medium to longer term strategies and their effect on performance)*. The tests performed used either current VC compensation *(lnVCPay)* or current changes in VC compensation *(*Δ*lnVCPay)* as explanatory variables to investigate whether they impact on future rankings. The results tabulated in Appendix A - Tables A9 and A10 disclose that only on 3 occasions did VC compensation impact on rankings and, in each case, the coefficient negatively impacted on rankings (Table A10, Columns 4 – 6). On no occasion, did the current change in VC compensation *(*Δ*lnVCPay)* Appendix A –Tables A11 and A12 impact on rankings. This outcome supports the findings in the main and sensitivity tests relating to model (1) that the levels and changes in VC compensation are not dependent upon rankings. Further, the levels and changes in VC Compensation do not drive future performance as measured by rankings.

The most notable feature using future rankings as a dependent variable is the reduction in the significance of the size measures *(TRev, TEFTSL and TStaff)* where only eleven out of thirty six separate regressions returns a significant result. This may be explained by the use of random effects regressions that enabled the inclusion of the time invariant indicators, being group of eight *(Gr-8),* coupled with the presence of a medical faculty *(Medicine)* as explanatory variables. However, the results vary depending upon whether the national GUG or international, QS and ARWU rankings are used. Using the QS and

ARWU rankings, the Gr-8[75] and the medical faculty[76] indicator variables have, as expected, a significant positive impact on rankings. As this result is only applicable to the larger universities with international rankings, it may explain the reduction in the significance of the size measure. Additionally, the fact that the older established "sand-stone" universities all have medical (and associated dental and veterinary science) faculties enables greater access to research funding leading to higher levels of research and better performance by way of higher rankings.

Other control variables returning a significant result include the international student ratio *(INSTUR)*[77] and the number of faculties *(TFaculties).*[78] As expected, both of these control variables have a positive impact on rankings. This may be explained by the high demand for study at Australian universities from international students, coupled with the larger universities, having a greater number of faculties being able to offer a greater diversity of study.

5.3 The Association between the Different Performance Measures and Abnormal Growth in VC compensation

Abnormal VC compensation is defined as the change in VC compensation minus the average change in compensation of the academic staff for a given year as defined in the enterprise bargaining agreements.[79] Due to enterprise bargaining agreements varying between universities, the tests incorporate a 4% average annual rise for academics

[75] Of the twenty four (36) regressions, the Gr-8 indicator variable is significant at the 1% on 23 occasions and once at the 5% level.
[76] Using the international rankings, the medical faculty returned a significant result in 15 out of 24 regressions and the GUG national rankings resulted in nine of twelve regressions returning a significant result.
[77] Using the GUG rankings, INSTUR is significant in 9 of twelve 12 regressions, whereas with the QS and ARWU rankings, there are 2 significant results from 24 regressions.
[78] Using the GUG rankings, TFaculties is significant in all regression models, whereas the QS and ARWU rankings only have a significant result in 8 of twenty four regressions. .
[79] Enterprise agreements are publicly available documents at the university websites, see for example: University of Technology Sydney Academic Staff Agreement 2014; http://www.hru.uts.edu.au/docs/manual/academic-staff-agreement-2014.pdf.

between 2005 and 2012. Abnormal increase is the difference between the VCs' compensation increases less a 4% charge on the VC earnings. In addition to the above sensitivity analysis, testing occurs for abnormal increases in VC compensation using the GUG, QS and ARWU performance measures and institutional indicators as detailed in Models (1), (2) and (3).

The models utilise both a relative percentage increase (decrease) and the cube root[80] of the abnormal VC compensation as dependent variables as there were instances where VC compensation decreased in a subsequent year.[81] The untabulated results disclose that for Model (1) a significant result was achieved for the GUG rankings' measure impacting positively on VC compensation on 3 occasions. However, there were no significant results for rankings impacting positively on VC compensation when using the QS and ARWU rankings. For Model (2), there were no instances where the change in rankings significantly impacts on abnormal VC compensation. For Model (3), out of eighteen regressions, there was only one instance of a significant relation where rankings impacted on abnormal VC compensation. However, this result is not in the predicted direction as it shows a negative association between abnormal VC compensation and increases in the ranking performance indicator. The results are not tabulated but they are available upon request.

5.4 Alternative Institutional Control Variable – Growth in Administration

Commercialisation of universities, coupled with an enhanced regulatory environment, has necessitated increased oversight and reporting disclosures with regard to all aspects of

[80] The decreases in pay would not be considered as natural logarithms do not consider negative numbers.
[81] For example, in 2007, F. Hilmer, VC at University of New South Wales had gross earnings of $1,425,000 and, in 2008, gross earnings reduced to $795,000 (University of New South Wales Annual Report, (2007 – 2008); similarly, G. Davis, VC at University of Melbourne, earned $765,000 in 2007, $1,055,000 in 2008 and $835,000 in 2009, (University of Melbourne, Annual Report, 2007 – 2009).

university operations. This has led to a growth in administrative structures and related staff. To investigate whether the growth in the size of administrative staff impacts on VC compensation, Models (1), (2), (3) and (5) are re-estimated using the GUG, QS and ARWU rankings data with the inclusion of an additional explanatory variable, being the administrative staff ratio *(ADStaffR)*.[82]

In total, nine regressions are estimated based on three size measures used with the three sets of rankings data.[83] As such, a total of thirty six regressions are performed. Although the results are not tabulated for brevity, the inclusion of *ADStaffR* provides some evidence that the size and growth in administration impacted on VC's compensation. Models (1) and (3) each returned a significant positive relation between *ADStaffR* and VC compensation on five from nine regressions. Model (2) returned a significant positive relation between *ADStaffR* and VC compensation on two from nine regressions. Model (5) results disclosed a significant negative impact of changes in the administrative staff ratio *(*Δ*ADStaffR)* on the change in VC Compensation on three from nine regressions. Overall, it would be expected that administrative support would be greater in larger universities, with these results confirming the impact of size on VC compensation. With regard to the performance measures[84] only on four from 36 regressions did a ranking measure return a significant result *(at the 5% and 10% level)*, This result confirms the main and sensitivity test results, that rankings as a performance measure do not provide strong support for the levels of VC compensation nor changes in VC compensation.

[82] *ADStaffR* calculated as the number of administrative staff divided by total staff.
[83] Based on the results of the Hausman test, Fixed Effects are used for models (1), (2) and (3) and random effects are used for model (5). In all cases robust standard errors are determined to control for heteroscedasticity.
[84] Comprising the ranking measures provided by GUG, QS and ARWU as used in models one, two, three and five.

In Models (1), (2) and (3), the adjusted R-squared *(ranged from 22.59% to 61.5 %)* and *F* statistics *(ranging from 12.69 to 59.09)* provide reasonable explanatory power of the models and are consistent with the main test results. Further, the size explanatory variables are significant in all 27 models and the admin staff ratio is significant and impacts positively on VC compensation in 12 out of 27 regressions. Six of the nine regressions where the *ADSTaffR* ratio is significant, the size measure used related to total staff (*TStaff*). The results in each case showed a higher positive coefficient for *ADStaffR* than *TStaff* indicating that the growth in the bureaucracy had a greater positive impact on VC compensation than the growth in *TStaff*.

For model (5), consistent with the main and sensitivity test results reported previously, the R-squared ranges between 7.5% and 15.90% indicating that the model has fairly weak explanatory power. The low Wald Chi^2 values confirm that this model, in the main, is not a reliable predictor of changes in VC compensation. Only on one occasion did a ranking performance measure positively impact on changes in VC compensation *(*Δ*lnVCPay) (at the 10% level)*. Using the changes data, the Δ*ADSTaffR* has a significant negative impact on changes in VC compensation in three of nine regressions when using the ARWU rankings. The fact that the coefficient of the constant in each case is larger than that reported in the main results compensates for the negative impact of the Δ*ADSTaffR* on the changes in VC's compensation *(*Δ*lnVCPay)*.

6 Conclusions

This chapter provides evidence on the association between VC compensation, changes in VC compensation and university performance where performance is measured by the rankings provided by independent ranking agencies. The use of rankings as an independent exogenous performance measure is based on the importance placed on these

results by both, university management and the media. The evidence provided in this chapter is that rankings used as an independent exogenous performance measure are not associated with the current level of VC compensation nor the growth in VC compensation between 2005 and 2012.

The main driver consistently found to impact on VC compensation was university size.[85] Given that university revenues over the period 2005 – 2012 grew by 176% and, at the same time, VC compensation grew by 164% is indicative of a reasonably strong relationship between these variables. The result suggests that VCs have an incentive to grow the university irrespective of the reduced standards it adopts for entry (Bagshaw, 2016; Hare, 2016). Obviously, the reduced entry standards have a positive impact on the number of students, total staff and total revenues, thereby increasing the size of the university and concurrently VC compensation.

To confirm the main findings, a number of sensitivity tests are undertaken. The first of these tests utilise two additional international university ranking data sets as alternative performance metrics. The results confirm the main test findings that there is no consistently significant observable relation between rankings and VC compensation. Additional sensitivity tests investigated (i) whether rankings in future years are influenced by current levels or changes in VC compensation, and (ii) the impact of the change in the academic and administrative staff ratios on VC compensation. Using these alternative model specifications, the evidence does not support the existence of a statistically significant relation between current or future rankings and VC compensation or changes in VC compensation.

[85] Size as measured by total revenue, student numbers (EFTSL), and total staff.

Overall, the evidence presented in this chapter demonstrates that VC compensation and growth in VC compensation are not a function of independently verifiable performance metrics. Alternately, VC performance measures may be based on internal (endogenous) university benchmarks rather than external rankings. Whilst many universities claim to have performance indicators for their VCs, they are neither publicly available nor do they necessarily relate to the performance of the university as measured by national and international rankings.[86] Hence, the level of VC compensation and the historical growth in VC compensation may best be described as a consequence of managerial power.

Given current university governance structures, VCs are in a powerful position to influence the university council. Further, most VCs are members of the remuneration committee and influence the compensation of senior executives (Deputy Vice Chancellors (DVC) and senior university bureaucrats), whose salary structures have also been deregulated. Hence, the oversight provided by the VC in determining university executive pay would no doubt have a flow on effect on VC compensation even if the VC absents himself when the remuneration (or Human Relations) committee determines a VC's compensation. To further complicate the issue, the determination of a VC's compensation could be influenced by the recommendations of an external compensation consultant. (Note: Unless you go on to discuss 'flow on issues', don't include). Finally, many universities do not disclose the existence of a remuneration committee, its membership nor the governance processes used to determine VC and senior executive compensation. Given the transformation of universities from academic institutions to academic enterprises with corporate style executive leadership (Marginson and

[86] "Thus, it is plausible to hypothesise that a notional 'going rate' or efficiency wage for the position of vice chancellor has prevailed, which is largely insensitive to any set of specific factors. This could be reflected, for instance, in that many of the key managerial and performance indicators currently fail to offer any explanation for reward levels" (Baimbridge and Simpson, 1996, page 637).

Considine, 2000), the governance structures applicable to academic institutions may need to be updated to reflect this change. Therefore, areas of interest for future research may relate to university governance with respect to (i) council membership, structure and qualifications required for membership, and (ii) justification and disclosure of performance standards with respect to VC and senior executive compensation using a formalised remuneration administration process employing independently verifiable performance metrics.

Appendix A – Tables supporting the sensitivity analysis

Table A1 – QS Rankings - Variables names and definitions

Variable	Definition
Dependent Variable	
$lnVCPay_{it}$	Natural Log of Total VC Compensation
$\Delta lnVCPay_{it}$	Change in Natural Log of Total VC Compensation
Performance Measures	
$TQSPoints_{it}$	Total Points as per QS rankings
$lnTQSPoints_{it}$	Log of Total QS points
QS Ranking Measures comprising TQSPoints	
score_acadrep_qs	Academic Reputation
score_cits_qs	Citations per Faculty
score_emprep_qs	Employer Reputation
score_facstud_qs	Faculty Student
score_intfac_qs	International Faculty
score_intstud_qs	International Students
Changes in Performance Rankings	
$\Delta lnTQSPoints_{it}$	Change in sum of total QS ranking points
$DTPointsQD_{it}$	Indicator variable for DECREASE in Total QS Rank Points
$DTPointsQU_{it}$	Indicator variable for INCREASE in Total QS Rank Points
$DTRnkQD_{it}$	Dummy Variable if County Ranking has moved DOWN
$DTRnkQU_{it}$	Dummy Variable if County Ranking has moved UP
$LTQSPoints_{it+1}$	Total QS Points in period t+1
$LTQSPoints_{it+2}$	Total QS Points in period t+2
$LTQSPoints_{it-1}$	Total QS Points in period t-1
Economic (Size) Controls	
$lnTEFTSL_{it}$	Natural Log of Total EFTSL
$lnTREV_{it}$	Natural log Total Revenue all sources
$lnTSTAFF_{it}$	Natural Log of Total Staff (Academic and Administrative)
Changes in (Size) Controls	
$\Delta lnTEFTSL_{it}$	Change in Natural Log of Total EFTSL
$\Delta lnTREV_{it}$	Change in Natural log Total Revenue all sources
$\Delta lnTSTAFF_{it}$	Change in Natural Log of Total Staff
Institutional (Complexity) Controls	
Gr-8	Group of 8 University
Medicine	Medical Faculty
$INTSTUR_{it}$	International Student Income ÷ Total Revenue
$TCampus_{it}$	Number of Campuses
$TFaculties_{it}$	Number of Faculties
$TCouncil_{it}$	Number of council members
$ADStaffR_{it}$	Admin Staff Ratio = Admin Staff Numbers ÷ Total Staff
Changes Institutional Controls	
$\Delta INTSTUR_{it}$	Change in International Student Income ÷ Total Revenue
$\Delta TCampus_{it}$	Change in Number of Campuses
$\Delta TCouncil_{it}$	Change in number of council members
$\Delta TFaculties_{it}$	Change in Number of Faculties
$\Delta ADStaffR_{it}$	Change in Admin Staff Ratio

Table A2 – ARWU Rankings - Variables names and definitions

Variable	Definition
Dependent Variable	
$lnVCPay_{it}$	Natural Log of Total VC Compensation
$\Delta lnVCPay_{it}$	Change in Natural Log of Total VC Compensation
Performance Measures	
$TPtsARWU_{it}$	Total Points as per ARWU rankings
$lnTPtsARWU_{it}$	Log of Total ARWU points
ARWU Ranking Measures comprising TQSPoints	
score_alumni_arwu	Number of Alumni of Nobel Laureates and Fields Medalist
score_award_arwu	Number of Staff of Nobel Laureates and Fields Medalists
score_hici_arwu	Number of Highly Cited Researchers
score_natsci_arwu	Number of Nature and Science Papers
score_public_arwu	Number of SCIE (science) and SSCI (social science) Papers
score_pcp_arwu	Per capita academic performance of an institution
Changes in Performance Rankings	
$\Delta lnTPtsARWU_{it}$	Change in sum of total QS ranking points
$DTPtsARWUD_{it}$	Dummy Indicator variable for DECREASE in Total QS Rank Points
$DTPtsARWUU_{it}$	Dummy Indicator variable for INCREASE in Total QS Rank Points
$DTRnkARWUD_{it}$	Dummy Variable if Australian Ranking has moved DOWN
$DTRnkARWUU_{it}$	Dummy Variable if Australian Ranking has moved UP
$LTPtsARWU+1_{it}$	Ln Total ARWU Ranking in t+1 period. (next period)
$LTPtsARWU+2_{it}$	Ln Total ARWU Ranking in t+2 period. (2 periods into the future)
$LTPtsARWUi-1_{it}$	Ln Total ARWU Ranking in t-1 period. (last period)
Economic (Size) Controls	
$lnTEFTSL_{it}$	Natural Log of Total EFTSL
$lnTREV_{it}$	Natural log Total Revenue all sources
$lnTSTAFF_{it}$	Natural Log of Total Staff (Academic and Administrative)
Changes in (Size) Controls	
$\Delta lnTEFTSL_{it}$	Change in Natural Log of Total EFTSL
$\Delta lnTREV_{it}$	Change in Natural log Total Revenue all sources
$\Delta lnTSTAFF_{it}$	Change in Natural Log of Total Staff
Institutional (Complexity) Controls	
Gr-8	Group of 8 University
Medicine	Medical Faculty
$INTSTUR_{it}$	International Student Income ÷ Total Revenue
$TCampus_{it}$	Number of Campuses
$TFaculties_{it}$	Number of Faculties
$TCouncil_{it}$	Number of council members
$ADStaffR_{it}$	Admin Staff Ratio = Admin Staff Numbers ÷ Total Staff
Changes Institutional Controls	
$\Delta INTSTUR_{it}$	Change in International Student Income ÷ Total Revenue
$\Delta TCampus_{it}$	Change in Number of Campuses
$\Delta TCouncil_{it}$	Change in number of council members
$\Delta TFaculties_{it}$	Change in Number of Faculties
$\Delta ADStaffR_{it}$	Change in Admin Staff Ratio

Table A3 - Regression results for Model 1 using QS and ARWU Rankings

Model 1 - QS Rankings:

$$lnVCPay_{it} = \alpha_0 + \beta_1 lnTQSPoints_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + T_6 Faculties_{it} + \varepsilon_i$$

Model 1 - ARWU Rankings:

$$lnVCPay_{it} = \alpha 0 + \beta_1 lnTPtsARWU_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + \beta_6 TFaculties_{it} + \varepsilon_i$$

		1	2	3	4	5	6
Dependent Variable $lnVCPay_{it}$	Predicted Sign	QS Ranking Data			ARWU Ranking Data		
		Total QS Points Rank using Log Total REVENUE as size control	Total QS Points Rank using Log Total EFTSL size control	Total QS Points Rank using Log Total STAFF as size control	Total ARWU Points Rank using Log Total REVENUE as size control	Total ARWU Points Rank using Log Total EFTSL size control	Total ARWU Points Rank using Log Total STAFF as size control
		β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*
$lnTQSPoints_{it}$	+	0.044	0.086	0.106			
		(0.460)	*(1.050)*	*(1.150)*			
$lnTPtsARWU_{it}$	+				0.326**	0.161	0.498***
					(2.070)	*(1.150)*	*(2.910)*
$lnSIZE_{it}$	+	0.689***	1.501***	1.241***	0.530***	1.417***	0.834***
		(6.410)	*(6.550)*	*(4.970)*	*(6.460)*	*(6.830)*	*(4.110)*
$INTSTUR_{it}$	+	1.830*	-0.066	0.676	2.274	0.420	2.574*
		(1.840)	*-(0.060)*	*(0.590)*	*(1.770)*	*(0.250)*	*(1.770)*
$TCouncil_{it}$	?	0.015	0.013	0.012	0.019**	0.015	0.013
		(1.110)	*(0.800)*	*(0.810)*	*(2.390)*	*(1.520)*	*(1.200)*
$TCampus_{it}$	+ / -	-0.006	-0.031	-0.034	-0.015	-0.042**	-0.031
		-(0.220)	*-(1.220)*	*-(1.130)*	*-(0.660)*	*-(2.190)*	*-(1.030)*
$TFaculties_{it}$	+	-0.005	-0.015	-0.029	-0.010	-0.018	-0.018
		-(0.280)	*-(1.090)*	*-(1.490)*	*-(0.460)*	*-(1.070)*	*-(0.890)*
Constant		3.505**	-1.968	3.053	4.923***	-1.118	4.998***
		(2.560)	*-(0.950)*	*(1.610)*	*(4.590)*	*-(0.660)*	*(3.410)*
Adjusted R^2		0.406	0.431	0.343	0.390	0.436	0.350
F		22.56***	16.82***	9.80***	15.81***	19.19***	13.65***
No. Obs.		129	129	129	103	103	103
Fixed Effects		√	√	√	√	√	√

, **, & * indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*
T-statistics using robust standard errors are listed below the coefficient estimates.

All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.

Table A4 - Regression results for Model 2 using QS and ARWU Rankings

Model 2 – QS Rankings:

$$lnVCPay_{it} = \alpha_0 + \beta_1 \Delta lnTQSPoints_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + T_6 Faculties_{it} + \varepsilon_i$$

Model 2 – ARWU Rankings:

$$lnVCPay_{it} = \alpha 0 + \beta_1 \Delta lnTPtsARWU_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 TCampus_{it} + \beta_6 TFaculties_{it} + \varepsilon_i$$

		1	2	3	4	5	6
Dependent Variable $lnVCPay_{it}$	Predicted Sign	QS Ranking Data			ARWU Ranking Data		
		Change in Total QS Rank using Log Total REVEUE as size control size	Change in Total QS Rank using Log Total EFTSL as size control	Change in Total QS Rank using Log Total STAFF size control	Change in Total ARWU Rank using Log Total REVEUE as size control size	Change in Total ARWU Rank using Log Total EFTSL as size control	Change in Total ARWU Rank using Log Total STAFF size control
		β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*
$\Delta lnTQSPoints_{it}$	+	0.063	0.056	0.028			
		(1.510)	*(1.140)*	*(0.590)*			
$\Delta lnTPtsARWU_{it}$	+				-0.281	-0.217*	-0.309*
					-(1.570)	*-(1.640)*	*-(1.810)*
$lnSIZE_{it}$	+	0.610***	1.432***	1.324***	0.353*	1.203***	0.934***
		(4.880)	*(5.790)*	*(5.470)*	*(1.910)*	*(4.080)*	*(3.290)*
$INTSTUR_{it}$	+	1.523	-0.395	0.509	1.151	-1.308	0.304
		(1.390)	*-(0.370)*	*(0.500)*	*(0.700)*	*-(0.790)*	*(0.190)*
$TCouncil_{it}$	?	0.004	0.003	0.008	0.006	0.003	0.007
		(0.260)	*(0.150)*	*(0.450)*	*(0.790)*	*(0.350)*	*(0.740)*
$TCampus_{it}$	+ / -	0.063*	0.043	0.055	0.099**	0.057	0.075
		(1.670)	*(0.800)*	*(1.530)*	*(2.060)*	*(1.170)*	*(1.560)*
$TFaculties_{it}$	+	-0.011	-0.016	-0.020*	-0.031*	-0.035***	-0.036***
		-(0.890)	*-(1.570)*	*-(1.860)*	*-(1.880)*	*-(2.620)*	*-(2.580)*
Constant		4.691***	-1.051	2.385	8.228***	1.614	5.646***
		(2.730)	*-(0.440)*	*(1.280)*	*(3.310)*	*(0.580)*	*(2.620)*
Adjusted R^2		0.286	0.319	0.287	0.190	0.269	0.217
F		16.36***	18.94***	25.88***	29.11***	43.23***	54.59***
No. Obs.		111	111	111	82	82	82
Fixed Effects		√	√	√	√	√	√

, **, & * indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*
T-statistics using robust standard errors are listed below the coefficient estimates.

All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.

Table A5 - Regression results for Model 3 using QS and ARWU Rankings

Model 3 - QS Rankings: (Dummy for movement DOWN or UP in Total Points)

$$lnVCPay_{it} = \alpha_0 + \beta_1 DTPointsQD_{it} + \beta_2 DTPointsQU_{it} + \beta_3 lnSIZE_{it} + \beta_4 INTSTUR_{it} + \beta_5 TCouncil_{it} + \beta_6 TCampus_{it} + T_7 Faculties_{it} + \varepsilon_i$$

Model 3 – ARWU Rankings: (Dummy for movement DOWN or UP in Total Points)

$$lnVCPay_{it} = \alpha_0 + \beta_1 DTPtsARWUD_{it} + \beta_2 DTPtsARWUU_{it} + \beta_3 lnSIZE_{it} + \beta_4 INTSTUR_{it} + \beta_5 TCouncil_{it} + \beta_6 TCampus_{it} + T_7 Faculties_{it} + \varepsilon_i$$

		1	2	3	4	5	6
		QS Ranking Data			ARWU Ranking Data		
Dependent Variable $lnVCPay_{it}$	Predicted Sign	Movement in Points UP-DOWN using Log Total REVENUE as size control	Movement in Points UP-DOWN using Log Total EFTSL as size control	Movement in Points UP-DOWN using Log Total STAFF as size control	Movement in Points UP-DOWN using Log Total REVENUE as size control	Movement in Points UP-DOWN using Log Total EFTSL as size control	Movement in Points UP-DOWN using Log Total STAFF as size control
		β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*
$DTPointsQD_{it}$ *(Dummy Va*	-	0.054	0.061	0.092			
		(0.990)	*(1.050)*	*(1.490)*			
$DTPointsQU_{it}$ *(Dummy Va*	+	0.024	0.028	0.087			
		(0.440)	*(0.490)*	*(1.380)*			
$DTPtsARWUD_{it}$ *(Dummy*	-				0.029	0.032	0.083
					(0.470)	*(0.560)*	*(1.230)*
$DTPtsARWUU_{it}$ *(Dummy*	+				0.027	0.026	0.058
					(0.780)	*(0.690)*	*(1.520)*
$lnSIZE_{it}$	+	0.680***	1.489***	1.182***	0.601***	1.475***	1.088***
		(8.020)	*(6.140)*	*(5.650)*	*(6.840)*	*(6.920)*	*(4.850)*
$INTSTUR_{it}$	+ / -	1.973**	0.177	0.770	2.232*	0.372	2.424*
		(2.060)	*(0.160)*	*(0.650)*	*(1.670)*	*(0.220)*	*(1.790)*
$TCouncil_{it}$	?	0.017	0.015	0.014	0.018**	0.014	0.012
		(1.320)	*(0.980)*	*(1.130)*	*(1.970)*	*(1.400)*	*(1.070)*
$Tcampus_{it}$	+ / -	-0.005	-0.031	-0.030	-0.013	-0.040*	-0.031
		-(0.180)	*-(1.100)*	*-(0.920)*	*-(0.560)*	*-(1.730)*	*-(0.930)*
$Tfaculties_{it}$	+	-0.004	-0.014	-0.025	-0.011	-0.018	-0.019
		-(0.240)	*-(1.180)*	*-(1.420)*	*-(0.500)*	*-(1.140)*	*-(1.030)*
Constant		3.693***	-1.635	3.777**	4.841***	-1.275	4.294**
		(3.050)	*-(0.710)*	*(2.190)*	*(4.080)*	*-(0.690)*	*(2.280)*
Adjusted R^2		0.410	0.431	0.355	0.379	0.432	0.346
F		22.63***	10.38***	9.30***	14.64***	17.53***	10.45***
No. Obs.		129	129	129	103	103	103
Fixed Effects		√	√	√	√	√	√

, **, & * indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*
T-statistics using robust standard errors are listed below the coefficient estimates.

All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.

Regressions based on the sum of TOTAL points going UP or DOWN using separate indicator variables for UP and DOWN for the period 2005 -2012 for both QS and ARWU ranking data.

Table A6 - Regression results for Model 3A using QS and ARWU Rankings

Model 3A – QS Rankings: (Dummy for movement DOWN or UP in overall RANK position

$lnVCPay_{it} = \alpha_0 + \beta_1 DTRnkQD_{it} + \beta_2 DTRnkQU_{it} + \beta_3 lnSIZE_{it} + \beta_4 INTSTUR_{it} + \beta_5 TCouncil_{it} + \beta_6 TCampus_{it} + T_7 Faculties_{it} + \varepsilon_i$

Model 3A – ARWU Rankings: (Dummy for movement DOWN or UP in overall RANK position

$lnVCPay_{it} = \alpha_0 + \beta_1 DTRnkARWUD_{it} + \beta_2 DTRnkARWUU_{it} + \beta_3 lnSIZE_{it} + \beta_4 INTSTUR_{it} + \beta_5 TCouncil_{it} + \beta_6 TCampus_{it} + T_7 Faculties_{it} + \varepsilon_i$

		1	2	3	4	5	6
		QS Ranking Data			ARWU Ranking Data		
Dependent Variable $lnVCPay_{it}$	Predicted Sign	D-UP & D-Down for Country Position using Log Total REVENUE as size control	D-UP & D-Down for Country Position using Log Total EFTSL as size control	D-UP & D-Down for Country Position using Log Total STAFF as size control	D-UP & D-Down for Country Position using Log Total REVENUE as size control	D-UP & D-Down for Country Position using Log Total EFTSL as size control	D-UP & D-Down for Country Position using Log Total STAFF as size control
		β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*
$DRnkQD_{it}$	-	-0.033	-0.010	0.017			
		-(0.610)	*-(0.180)*	*(0.300)*			
$DRnkQU_{it}$	+	-0.020	-0.014	0.032			
		-(0.400)	*-(0.270)*	*(0.540)*			
$DTRnkARWUD_{it}$	-				-0.041	-0.025	-0.001
					-(1.470)	*-(0.880)*	*-(0.050)*
$DTRnkARWUU_{it}$	+				0.021	0.017	0.067**
					(0.620)	*(0.490)*	*(2.170)*
$lnSIZE_{it}$	+	0.723***	1.561***	1.250***	0.633***	1.521***	1.138***
		(8.520)	*(6.230)*	*(5.880)*	*(8.350)*	*(7.560)*	*(5.020)*
$INTSTUR_{it}$	+ / -	1.904*	0.057	0.798	2.040	0.198	2.288*
		(1.980)	*(0.050)*	*(0.640)*	*(1.640)*	*(0.120)*	*(1.720)*
$TCouncil_{it}$	?	0.015	0.013	0.013	0.017*	0.014	0.014
		(1.040)	*(0.760)*	*(0.870)*	*(1.860)*	*(1.210)*	*(1.110)*
$TCampus_{it}$	+ / -	-0.008	-0.037	-0.036	-0.016	-0.043**	-0.036
		-(0.270)	*-(1.190)*	*-(0.990)*	*-(0.710)*	*-(2.120)*	*-(1.090)*
$TFaculties_{it}$	+	-0.006	-0.015	-0.029	-0.013	-0.020	-0.022
		-(0.360)	*-(1.250)*	*-(1.610)*	*-(0.590)*	*-(1.270)*	*-(1.200)*
Constant		3.234**	-2.204	3.355*	4.506***	-1.647	3.936**
		(2.540)	*(-0.94)*	*(1.890)*	*(4.300)*	*-(0.960)*	*(2.180)*
Adjusted R^2		0.402	0.419	0.328	0.382	0.431	0.338
F		15.65***	9.47***	8.20***	24.48***	17.76***	12.16***
No. Obs.		129	129	129	103	103	103
Fixed Effects		√	√	√	√	√	√

, **, & * indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*
T-statistics using robust standard errors are listed below the coefficient estimates.

All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.

Regressions based on the movement UP or DOWN in Overall RANK using separate indicator variables for UP and DOWN for the period 2005 -2012 for both QS and ARWU ranking data.

Table A7 - Regression results for Model 4 using QS and ARWU Rankings

Model 4 – QS Rankings

$$lnVCPay_{it} = \alpha_0 + \beta_1 score\_acadrep\_qs + \beta_2 score\_cits\_qs + \beta_3 score\_emprep\_qs + \beta_4 score\_facstud\_qs + \beta_5 score\_intfac\_qs + \beta_6 score\_intstud\_qs + \beta_7 lnSIZE_{it} + \beta_8 INTSTUR_{it} + \beta_9 TCouncil_{it} + \beta_{10} TCampus_{it} + \beta_{11} TFaculties_{it} + \varepsilon_i$$

Model 4 – ARWU Rankings

$$lnVCPay_{it} = \alpha_0 + \beta_1 score\_alumni\_arwu_{it} + + \beta_2 score\_award\_arwu_{it} + \beta_3 score\_hici\_arwu_{it} + \beta_4 score\_natsci\_arwu_{it} + \beta_5 score\_public\_arwu_{it} + \beta_6 score\_pcp\_arwu_{it} + \beta_7 lnSIZE_{it} + \beta_8 INTSTUR_{it} + \beta_9 TCouncil_{it} + \beta_{10} TCampus_{it} + \beta_{11} TFaculties_{it} + \varepsilon_i$$

Dependent Variable $lnVCPay_{it}$	Predicted Sign	1	2	3	4	5	6
		QS Ranking Data			ARWU Ranking Data		
		Individual Ranking Measures using log Total REVENUE as size control	Individual Ranking Measures using log Total EFTSL as size control	Individual Ranking Measures using log Total STAFF as size control	Individual Ranking Measures using log Total REVENUE as size control	Individual Ranking Measures using log Total EFTSL as size control	Individual Ranking Measures using log Total STAFF as size control
		β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*
$score\_acadrep\_qs_{it}$	+	0.000	0.001	0.003			
		(0.260)	*(0.820)*	*(1.550)*			
$score\_cits\_qs_{it}$	+	0.000	-0.001	-0.002			
		-(0.210)	*-(0.340)*	*-(1.390)*			
$score\_emprep\_qs_{it}$	+	-0.001	-0.001	0.000			
		-(0.580)	*-(0.460)*	*(0.230)*			
$score\_facstud\_qs_{it}$	+	0.000	0.001	-0.001			
		-(0.090)	*(0.820)*	*-(0.740)*			
$score\_intfac\_qs_{it}$	+	0.002	0.002	0.003**			
		(1.590)	*(1.320)*	*(2.270)*			
$score\_intstud\_qs_{it}$	+	0.002*	0.001	0.001			
		(1.650)	*(0.820)*	*(1.140)*			
$score\_alumni\_arwu_{it}$	+				0.000	-0.002	0.000
					(0.030)	*-(0.850)*	*-(0.020)*
$score\_award\_arwu_{it}$	+				0.003	0.001	-0.001
					(0.610)	*(0.400)*	*-(0.320)*
$score\_hici\_arwu_{it}$	+				0.003	0.001	0.004
					(0.270)	*(0.120)*	*(0.370)*
$score\_natsci\_arwu_{it}$	+				-0.012	-0.010	-0.014
					-(0.940)	*-(0.800)*	*-(1.190)*
$score\_public\_arwu_{it}$	+				0.003	0.000	0.005
					(0.350)	*(0.050)*	*(0.650)*
$score\_pcp\_arwu_{it}$	+				0.021	0.024*	0.029**
					(1.350)	*(1.800)*	*(2.020)*
$lnSIZE_{it}$	+	0.619***	1.361***	1.086***	0.491***	1.327***	0.848***
		(5.170)	*(5.380)*	*(4.240)*	*(3.340)*	*(5.620)*	*(2.880)*
$INTSTUR_{it}$	+	1.527	-0.202	0.365	2.192	0.467	2.245*
		(1.360)	*-(0.180)*	*(0.330)*	*(1.610)*	*(0.310)*	*(1.720)*
$TCouncil_{it}$	?	0.020*	0.019	0.019	0.021*	0.019*	0.019*
		(1.910)	*(1.590)*	*(1.730)*	*(2.220)*	*(1.730)*	*(1.850)*
$TCampus_{it}$	+ / -	-0.021	-0.033	-0.04*	-0.005	-0.027*	-0.018
		-(0.860)	*-(1.470)*	*-(1.660)*	*-(0.280)*	*-(1.670)*	*-(0.740)*
$TFaculties_{it}$	+	-0.001	-0.013	-0.024	-0.001	-0.008	-0.003
		-(0.040)	*-(0.780)*	*-(1.200)*	*-(0.030)*	*-(0.450)*	*-(0.170)*
Constant		4.400*	-0.572	4.265*	5.706**	-0.421	5.317**
		(2.600)	*-(0.240)*	*(2.100)*	*(3.550)*	*-(0.220)*	*(2.440)*
Adjusted R^2		0.407	0.432	0.371	0.388	0.448	0.369
F-Statistic		37.50***	22.15***	12.15***	492.43***	813.83***	293.19***
Number of Observations		129	129	129	103	103	103
Fixed Effects		√	√	√	√	√	√

, **, & * indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*
T-statistics using robust standard errors are listed below the coefficient estimates.

All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.

Regressions using individual ranking measures employed by QS and ARWU rating agencies to investigate whether any individual ranking measure has an impact on VC's compensation.

Table A8 - Regression results for Model 5 using QS and ARWU Rankings

Model 5 – QS Rankings:

$$\Delta lnVCPay_{it} = \alpha_0 + \beta_1 \Delta lnTQSPoints_{it} + \beta_2 \Delta lnSIZE_{it} + \beta_3 \Delta INTSTUR_{it} + \beta 4 Medicine_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 \Delta TCouncil_{it} + \beta_7 \Delta TCampus_{it} + \beta_8 \Delta TFaculties_{it} + \varepsilon_i$$

Model 5 – ARWU Rankings:

$$\Delta lnVCPay_{it} = \alpha_0 + \beta_1 \Delta lnTPtsARWU_{it} + \beta_2 \Delta lnSIZE_{it} + \beta_3 \Delta INTSTUR_{it} + \beta 4 Medicine_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 \Delta TCouncil_{it} + \beta_7 \Delta TCampus_{it} + \beta_8 \Delta TFaculties_{it} + \varepsilon_i$$

Dependent Variable ΔlnVCPay	Predicted Sign	1	2	3	4	5	6
		QS Ranking Data			ARWU Ranking Data		
		Impact of Changes using ΔLOG Total REVENUE as size control	Impact of Changes using ΔLOG Total EFTSL as size control	Impact of Changes using ΔLOG Total STAFF as size control	Impact of Changes using ΔLOG Total REVENUE as size control	Impact of Changes using ΔLOG Total EFTSL as size control	Impact of Changes using ΔLOG Total STAFF as size control
		β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*
$\Delta lnTQSPoints_{it}$	+	0.108	0.112	0.097			
		(1.140)	*(1.170)*	*(1.160)*			
$\Delta lnTPtsARWU_{it}$	+				0.163	0.103	0.030
					(1.037)	*(0.575)*	*(0.160)*
$\Delta lnTSIZE_{it}$	+	0.041	0.550	0.447	-0.115	0.230	0.770
		(0.110)	*(0.940)*	*(0.660)*	*-(0.272)*	*(0.309)*	*(0.871)*
$\Delta INTSTUR_{it}$	+	1.070	0.670	0.994	2.440	2.456	2.718**
		(0.750)	*(0.760)*	*(1.130)*	*(1.318)*	*(1.613)*	*(1.984)*
$Medicine_{it}$	+	0.002	-0.002	-0.004	-0.009	-0.007	-0.020
		(0.100)	*-(0.110)*	*-(0.180)*	*-(0.292)*	*-(0.254)*	*-(0.609)*
$Gr\text{-}8_{it}$	+	-0.031	-0.023	-0.028	-0.035	-0.029	-0.032
		-(1.160)	*-(0.840)*	*-(1.040)*	*-(1.309)*	*-(1.012)*	*-(1.266)*
$\Delta TCouncil_{it}$	?	0.001	0.002	0.002	0.011	0.012	0.011
		(0.450)	*(0.420)*	*(0.440)*	*(1.199)*	*(1.266)*	*(1.132)*
$\Delta TCampus_{it}$	+ / -	-0.001	-0.003	-0.009	-0.008	-0.009	-0.023
		-(0.060)	*-(0.220)*	*-(0.510)*	*-(1.319)*	*-(0.947)*	*-(1.096)*
$\Delta TFaculties_{it}$	+	0.022	0.024	0.021	0.026	0.025	0.023
		(1.370)	*(1.600)*	*(1.440)*	*(1.022)*	*(1.079)*	*(1.081)*
Constant		0.086**	0.065**	0.075***	0.115**	0.090**	0.083**
		(2.470)	*(2.290)*	*(3.100)*	*(2.433)*	*(1.987)*	*(2.517)*
R^2 *(overall)*		0.057	0.067	0.070	0.059	0.059	0.088
Wald chi^2 (8)		10.980	12.450	10.460	24.33**	13.380	12.960
Number of Observations		104	104	104	82	82	82
Random Effects		√	√	√	√	√	√

Z-score robust standard errors are listed below the coefficient estimates.
, **, & * indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*

All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.

Table A9 - Regression results for Model 1 Using Next period's Total Ranking Points (t + 1) as the Dependent Variable with the current period VC's compensation being the key independent variable

Model 1: GUG Rankings

$$TRankG_{it+1} = \alpha_0 + \beta_1 lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 1: QS Rankings

$$LTQSPoints_{it+1} = \alpha_0 + \beta_1 lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 1: ARWU Rankings

$$LTPtsARWU_{it+1} = \alpha_0 + \beta_1 lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

		1	2	3	4	5	6	7	8	9
Dependent Variable = Next Years RANKINGS (t+1)	Predicted Sign	GUG Ranking Data			QS Ranking Data			ARWU Ranking Data		
		Total GUG Points Rank using Log Total REVENUE as size control	Total GUG Points Rank using Log Total EFTSL as size control	Total GUG Points Rank using Log Total STAFF as size control	Total QS Points Rank using Log Total REVENUE as size control	Total QS Points Rank using Log Total EFTSL as size control	Total QS Points Rank using Log Total STAFF as size control	Total ARWU Points Rank using Log Total REVENUE as size control	Total ARWU Points Rank using Log Total EFTSL size control	Total ARWU Points Rank using Log Total STAFF as size control
Dependent Variable		$TRankG_{it+1}$	$TRankG_{it+1}$	$TRankG_{it+1}$	$LTQSPoints_{it+1}$	$LTQSPoints_{it+1}$	$LTQSPoints_{it+1}$	$LTPtsARWU_{it+1}$	$LTPtsARWU_{it+1}$	$LTPtsARWU_{it+1}$
		β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*
$lnVCPay_{it}$	+	-0.864	-0.260	-0.687	-0.033	0.047	0.041	0.005	0.057	0.034
		-(0.619)	*-(0.218)*	*-(0.556)*	*(-0.260)*	*(0.340)*	*(0.270)*	*(0.150)*	*(1.180)*	*(0.850)*
Log $SIZE_{it}$	+	0.117	-1.125	-0.255	0.238*	0.081	0.086	0.178***	0.052	0.202**
		(0.105)	*-(1.272)*	*-(0.255)*	*(1.830)*	*(0.460)*	*(0.710)*	*(2.720)*	*(0.390)*	*(1.980)*
$INTSTUR_{it}$	+	16.494***	19.020***	16.844***	0.848	0.654	0.414	0.110	0.465	0.335
		(3.023)	*(3.573)*	*(3.312)*	*(1.080)*	*(0.600)*	*(0.590)*	*(0.240)*	*(0.780)*	*(0.830)*
$TCouncil_{it}$	?	0.055	0.101	0.070	-0.018	-0.021	-0.020	-0.009	-0.014	-0.013
		(0.382)	*(0.723)*	*(0.483)*	*-(0.870)*	*-(0.960)*	*-(0.960)*	*-(0.930)*	*-(1.440)*	*-(1.380)*
$Gr\text{-}8_{it}$	+	1.970	2.092	2.208	0.542**	0.698***	0.652***	0.539***	0.670***	0.524***
		(1.122)	*(1.213)*	*(1.223)*	*(2.460)*	*(3.660)*	*(4.110)*	*(4.430)*	*(5.090)*	*(3.780)*
$Medicine_{it}$	+	1.779**	2.033**	1.872**	-0.155	-0.152	-0.146	0.165***	0.184***	0.166**
		(1.995)	*(2.496)*	*(2.064)*	*-(1.370)*	*-(1.290)*	*-(1.270)*	*(2.610)*	*(3.290)*	*(2.270)*
$TCampus_{it}$	+ / -	-0.094	-0.060	-0.084	-0.017	-0.015	-0.014	0.001	0.004	-0.002
		-(0.661)	*-(0.498)*	*-(0.636)*	*-(1.040)*	*-(1.010)*	*-(0.990)*	*(0.150)*	*(0.540)*	*-(0.300)*
$TFaculties_{it}$	+	0.282***	0.317***	0.289***	0.009	0.006	0.005	-0.002	-0.004	-0.004
		(2.897)	*(3.581)*	*(3.023)*	*(0.540)*	*(0.330)*	*(0.320)*	*-(0.380)*	*-(0.580)*	*-(0.640)*
Constant		17.528	20.154	18.119	1.561	2.838	2.982	0.029	1.165	0.471
		(1.026)	*(1.114)*	*(1.052)*	*(0.590)*	*(1.170)*	*(1.590)*	*(0.030)*	*(0.880)*	*(0.460)*
R^2 Overall		0.326	0.355	0.332	0.606	0.584	0.600	0.829	0.811	0.805
Wald chi^2 (8)		65.77***	81.09***	67.03***	152.77***	125.34***	121.69***	468.49***	353.33***	394.92***
Number of observations		147	147	147	102	102	102	82	82	82
Random Effects		*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*	*RE*
		*Z-score robust standard errors are listed below the coefficient estimates. *, **, & *** indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*								
		GUG Variables are defined in Table 3. All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.								

Table A10 - Regression results for Model 1 Using Total Ranking Points two years ahead (t + 2) as the Dependent Variable with the current period's VC Pay being the key independent variable

Model 1: GUG Rankings

$$TRankG_{it+2} = \alpha_0 + \beta_1 lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 1: QS Rankings

$$LTQSPoints_{it+2} = \alpha_0 + \beta_1 lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 1: ARWU Rankings

$$LTPtsARWU_{it+2} = \alpha_0 + \beta_1 lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

		1	2	3	4	5	6	7	8	9
		GUG Ranking Data			QS Ranking Data			ARWU Ranking Data		
Dependent Variable = Rankings TWO (t + 2) years ahead	Predicted Sign	Total GUG Points Rank using Log Total REVENUE as size control	Total GUG Points Rank using Log Total EFTSL size control	Total GUG Points Rank using Log Total STAFF as size control	Total QS Points Rank using Log Total REVENUE as size control	Total QS Points Rank using Log Total EFTSL size control	Total QS Points Rank using Log Total STAFF as size control	Total ARWU Points Rank using Log Total REVENUE as size control	Total ARWU Points Rank using Log Total EFTSL size control	Total ARWU Points Rank using Log Total STAFF as size control
Dependent Variable		$TRankG_{it+2}$	$TRankG_{it+2}$	$TRankG_{it+2}$	$LTQSPoints_{it+2}$	$LTQSPoints_{it+2}$	$LTQSPoints_{it+2}$	$LTPtsARWU_{it+2}$	$LTPtsARWU_{it+2}$	$LTPtsARWU_{it+2}$
		β / *t-stat*	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***	**β / *t-stat***
$lnVCPay_{it}$	+	1.394	1.370	0.704	-0.179*	-0.201**	-0.225**	0.000	0.035	0.008
		(1.016)	*(0.945)*	*(0.498)*	*-(1.790)*	*-(2.031)*	*-(2.189)*	*(0.000)*	*(0.910)*	*(0.280)*
Log $SIZE_{it}$	+	-1.445	-2.202**	-0.892	-0.065	-0.007	0.129	0.143**	0.071	0.227***
		-(1.370)	*-(2.090)*	*-(0.830)*	*-(0.753)*	*-(0.051)*	*(1.163)*	*(2.340)*	*(0.720)*	*(2.860)*
$INTSTUR_{it}$	+	10.691	13.697**	9.089	0.845**	0.792	0.686*	0.223	0.368	0.258
		(1.575)	*(1.962)*	*(1.278)*	*(2.275)*	*(1.640)*	*(1.864)*	*(0.640)*	*(0.980)*	*(0.850)*
$TCouncil_{it}$	?	0.124	0.184	0.124	-0.013	-0.013	-0.014	-0.017**	-0.021***	-0.021***
		(0.848)	*(1.209)*	*(0.866)*	*-(0.911)*	*-(0.843)*	*-(0.941)*	*-(2.500)*	*-(3.020)*	*-(3.320)*
$Gr\text{-}8_{it}$	+	2.310	1.585	2.041	0.886***	0.841***	0.739***	0.567***	0.662***	0.503***
		(1.145)	*(0.951)*	*(1.043)*	*(8.266)*	*(8.060)*	*(6.422)*	*(4.420)*	*(5.370)*	*(4.070)*
$Medicine_{it}$	+	2.151*	2.229**	2.078*	0.005	0.005	0.006	0.238***	0.252***	0.256***
		(1.894)	*(2.109)*	*(1.755)*	*(0.059)*	*(0.065)*	*(0.077)*	*(5.470)*	*(6.060)*	*(4.820)*
$TCampus_{it}$	+ / -	-0.063	-0.061	-0.082	-0.002	-0.002	-0.005	0.005	0.006	0.000
		-(0.400)	*-(0.414)*	*-(0.508)*	*-(0.311)*	*-(0.383)*	*-(0.678)*	*(1.230)*	*(1.360)*	*(0.100)*
$TFaculties_{it}$	+	0.333***	0.370***	0.318***	0.009	0.010*	0.01*	-0.003	-0.005	-0.005
		(3.025)	*(3.400)*	*(2.821)*	*(1.570)*	*(1.730)*	*(1.780)*	*-(0.540)*	*-(0.740)*	*-(0.710)*
Constant		6.631	7.995	4.553	6.864***	6.380***	5.700***	0.638	1.384	0.738
		(0.312)	*(0.385)*	*(0.225)*	*(7.120)*	*(5.840)*	*(5.510)*	*(0.790)*	*(1.360)*	*(0.960)*
R^2 Overall		0.341	0.362	0.320	0.772	0.779	0.794	0.832	0.808	0.814
Wald chi2 (8)		43.58***	54.76***	43.64***	189.04***	197.5***	239.69***	358.11***	378.71***	280.45***
Number of observations		112	112	112	78	78	78	62	62	62
Random Effects		√	√	√	√	√	√	√	√	√
		*Z-score robust standard errors are listed below the coefficient estimates. *, **, & *** indicate two tailed statistical significance at 10, 5 and 1 per cent level.*								
		GUG Variables are defined in Table 3. All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.								

Table A11 - Regression results for Model 2 Using Next period's Ranking Points as the Dependent Variable with the current period changes in VC's compensation being the key independent variable

Model 2: GUG Rankings

$$TRankG_{it+1} = \alpha_0 + \beta_1 \Delta lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 2: QS Rankings

$$LTQSPoints_{it+1} = \alpha_0 + \beta_1 \Delta lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 2: ARWU Rankings

$$LTPtsARWU_{it+1} = \alpha_0 + \beta_1 \Delta lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

		1	2	3	4	5	6	7	8	9
		GUG Ranking Data			QS Ranking Data			ARWU Ranking Data		
Dependent Variable = Next Years (t+1) RANKINGS	Predicted Sign	Total GUG Points Rank using Log Total REVENUE as size control	Total GUG Points Rank using Log Total EFTSL as size control	Total GUG Points Rank using Log Total STAFF as size control	Total QS Points Rank using Log Total REVENUE as size control	Total QS Points Rank using Log Total EFTSL as size control	Total QS Points Rank using Log Total STAFF as size control	Total ARWU Points Rank using Log Total REVENUE as size control	Total ARWU Points Rank using Log Total EFTSL as size control	Total ARWU Points Rank using Log Total STAFF as size control
Dependent Variable		$TRankG_{it+1}$	$TRankG_{it+1}$	$TRankG_{it+1}$	$LTQSPoints_{it+1}$	$LTQSPoints_{it+1}$	$LTQSPoints_{it+1}$	$LTPtsARWU_{it+1}$	$LTPtsARWU_{it+1}$	$LTPtsARWU_{it+1}$
		β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*	β / *t-stat*
$\Delta lnVCPay_{it}$	+	-2.562	-2.612	-2.536	0.023	0.023	0.025	0.005	0.001	0.005
		-(1.207)	*-(1.208)*	*-(1.186)*	*(0.720)*	*(0.790)*	*(0.870)*	*(0.320)*	*(0.060)*	*(0.330)*
Log $SIZE_{it}$	+	-0.670	-2.009*	-1.003	-0.121	-0.129	-0.119	0.192**	0.098	0.307**
		-(0.644)	*-(1.919)*	*-(0.962)*	*-(1.070)*	*-(0.870)*	*-(0.850)*	*(2.810)*	*(0.640)*	*(3.030)*
$INTSTUR_{it}$	+	15.874**	19.416***	15.548**	-0.625	-0.640	-0.661	0.300	0.650	0.399
		(2.793)	*(3.850)*	*(2.922)*	*-(1.190)*	*-(1.070)*	*-(1.600)*	*(0.480)*	*(0.790)*	*(0.660)*
$TCouncil_{it}$	?	0.009	0.065	0.032	-0.022	-0.022	-0.021	0.002	0.001	0.002
		(0.046)	*(0.345)*	*(0.166)*	*-(1.400)*	*-(1.260)*	*-(1.280)*	*(0.220)*	*(0.090)*	*(0.180)*
$Gr\text{-}8_{it}$	+	2.372	2.260	2.627	0.828***	0.757***	0.824***	0.512***	0.650***	0.420**
		(1.272)	*(1.447)*	*(1.381)*	*(4.600)*	*(5.330)*	*(5.230)*	*(4.250)*	*(4.330)*	*(2.720)*
$Medicine_{it}$	+	1.765*	1.937**	1.827*	-0.131	-0.135	-0.127	0.229***	0.244***	0.240***
		(1.790)	*(2.190)*	*(1.864)*	*-(0.740)*	*-(0.730)*	*-(0.710)*	*(4.780)*	*(5.140)*	*(3.820)*
$TCampus_{it}$	+ / -	-0.133	-0.096	-0.130	-0.004	-0.004	-0.005	-0.003	0.006	-0.006
		-(0.787)	*-(0.641)*	*-(0.785)*	*-(0.290)*	*-(0.330)*	*-(0.380)*	*-(0.310)*	*(0.490)*	*-(0.500)*
$TFaculties_{it}$	+	0.298***	0.339***	0.305***	0.018*	0.021**	0.020**	-0.004	-0.008	-0.006
		(2.621)	*(3.292)*	*(2.722)*	*(1.770)*	*(2.170)*	*(2.120)*	*-(0.590)*	*-(0.970)*	*-(0.830)*
Constant		17.649	26.477**	16.122**	5.716***	5.396***	5.039***	-0.352	1.127	-0.195
		(1.332)	*(2.514)*	*(1.964)*	*(3.410)*	*(3.470)*	*(3.790)*	*-(0.370)*	*(0.720)*	*-(0.220)*
R^2 Overall		0.297	0.334	0.297	0.682	0.678	0.682	0.799	0.755	0.752
Wald chi^2 (8)		49.11***	65.69***	48.87***	135.99***	126.69***	161.09***	363.96***	311.77***	356.72***
Number of observations		111	111	111	84	84	84	62	62	62
Random Effects		√	√	√	√	√	√	√	√	√
		*Z-score robust standard errors are listed below the coefficient estimates. *, **, & *** indicate two tailed statistical signifcance at 10, 5 and 1 per cent levels.*								
		GUG Variables are defined in Table 3. All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.								

Table A12 - Regression results for Model 2 Using Total Ranking Points two years ahead (t + 2) as the Dependent Variable with the current period changes in VC's compensation being the key independent variable

Model 2: GUG Rankings

$$TRankG_{it+2} = \alpha_0 + \beta_1 \Delta lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 2: QS Rankings

$$LTQSPoints_{it+2} = \alpha_0 + \beta_1 \Delta lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

Model 2: ARWU Rankings

$$LTPtsARWU_{it+2} = \alpha_0 + \beta_1 \Delta lnVCPay_{it} + \beta_2 lnSIZE_{it} + \beta_3 INTSTUR_{it} + \beta_4 TCouncil_{it} + \beta_5 Gr\text{-}8_{it} + \beta_6 Medicine_{it} + \beta_7 TCampus_{it} + \beta_8 TFaculties_{it} + \varepsilon_i$$

		1	2	3	4	5	6	7	8	9
		GUG Ranking Data			**QS Ranking Data**			**ARWU Ranking Data**		
Dependent Variable = Rankings TWO (t + 2) years ahead	Predicted Sign	Total GUG Points Rank using Log Total REVENUE as size control	Total GUG Points Rank using Log Total EFTSL size control	Total GUG Points Rank using Log Total STAFF as size control	Total QS Points Rank using Log Total REVENUE as size control	Total QS Points Rank using Log Total EFTSL size control	Total QS Points Rank using Log Total STAFF as size control	Total ARWU Points Rank using Log Total REVENUE as size control	Total ARWU Points Rank using Log Total EFTSL size control	Total ARWU Points Rank using Log Total STAFF as size control
Dependent Variable		$TRankG_{it+2}$	$TRankG_{it+2}$	$TRankG_{it+2}$	$LTQSPoints_{it+2}$	$LTQSPoints_{it+2}$	$LTQSPoints_{it+2}$	$LTPtsARWU_{it+2}$	$LTPtsARWU_{it+2}$	$LTPtsARWU_{it+2}$
		β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*	β / *z-score*
$\Delta lnVCPay_{it}$	+	0.692	0.605	0.663	-0.020	-0.017	-0.016	-0.005	-0.008	-0.006
		(0.515)	*(0.442)*	*(0.485)*	*-(0.631)*	*-(0.508)*	*-(0.400)*	*-(0.257)*	*-(0.320)*	*-(0.265)*
Log $SIZE_{it}$	+	0.247	-1.003	-0.373	-0.108	-0.167	-0.071	0.199***	0.206	0.408***
		(0.193)	*-(0.687)*	*-(0.266)*	*-(1.149)*	*-(1.263)*	*-(0.918)*	*(2.948)*	*(1.370)*	*(2.955)*
$INTSTUR_{it}$	+	12.705	15.761*	13.696*	0.398	0.663	0.310	0.154	0.025	-0.018
		(1.432)	*(1.934)*	*(1.775)*	*(0.842)*	*(1.076)*	*(0.767)*	*(0.411)*	*(0.060)*	*-(0.054)*
$TCouncil_{it}$	?	0.050	0.106	0.077	-0.020	-0.013	-0.019	-0.017	-0.02	-0.021
		(0.335)	*(0.672)*	*(0.520)*	*-(1.155)*	*-(0.718)*	*-(1.075)*	*-(1.109)*	*-(1.098)*	*-(1.247)*
$Gr\text{-}8_{it}$	+	1.644	2.084	2.124	0.855***	0.805***	0.827***	0.525***	0.613***	0.324**
		(0.748)	*(1.221)*	*(0.982)*	*(6.261)*	*(7.758)*	*(6.564)*	*(5.097)*	*(4.606)*	*(2.482)*
$Medicine_{it}$	+	1.601	1.789	1.737	-0.217**	-0.227**	-0.210**	0.253***	0.307***	0.344***
		(1.243)	*(1.547)*	*(1.435)*	*-(2.268)*	*-(2.273)*	*-(2.221)*	*(5.072)*	*(5.842)*	*(6.666)*
$TCampus_{it}$	+ / -	-0.376*	-0.340*	-0.359*	-0.004	-0.003	-0.004	-0.008	-0.002	-0.012
		-(1.700)	*-(1.678)*	*-(1.713)*	*-(0.486)*	*-(0.523)*	*-(0.556)*	*-(0.657)*	*-(0.179)*	*-(0.784)*
$TFaculties_{it}$	+	0.369**	0.404***	0.388*	0.014**	0.016**	0.015**	-0.003	-0.005	-0.004
		(2.361)	*(2.721)*	*(2.530)*	*(2.040)*	*(2.379)*	*(2.137)*	*-(0.412)*	*-(0.690)*	*-(0.579)*
Constant		5.708	16.549	10.709	5.425***	5.500***	4.569***	-0.008	0.585	-0.495
		(0.354)	*(1.205)*	*(0.994)*	*(4.310)*	*(5.110)*	*(6.650)*	*-(0.010)*	*(0.369)*	*-(0.508)*
R^2 Overall		0.296	0.316	0.303	0.835	0.838	0.835	0.808	0.753	0.766
Wald chi^2 (8)		21.41**	25.42**	23.13**	183.80***	246.23***	210.49***	570.85***	512.64***	697.84***
Number of observations		111	111	111	60	60	60	43	43	43
Random Effects		√	√	√	√	√	√	√	√	√
		*Z-score robust standard errors are listed below the coefficient estimates. *, **, & *** indicate two tailed statistical signifcance at 10, 5 and 1 per cent level.*								
		GUG Variables are defined in Table 3. All QS and ARWU variables are defined in Appemnix A - Table1 and 2 respectively.								

Table A13 – Details of the Total Rank score and descriptive statistics by University and year.

TRankG	YEAR								University Specific Descriptive Statistics				
University	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**Number of Obs**	**Institution Maximium**	**Institution Minimum**	**Institutional Average**	**Standard Deviation**
ACU	16	16			19	17	18	18	6	19	16	17.33	1.21
ANU	20	21	21	14	19	21			6	21	14	19.33	2.73
CDU						15	11	9	3	15	9	11.67	3.06
CQU	18	20	20	18			18	17	6	20	17	18.50	1.22
CSU				15		20			2	20	15	17.50	3.54
CUT			14	10	9	16	15	13	6	16	9	12.83	2.79
DEAK	12	13	11	8			8	11	6	13	8	10.50	2.07
ECU			8	7	7	12	10	9	6	12	7	8.83	1.94
FLU	14	14			14	12	14	13	6	14	12	13.50	0.84
GRU	12	12	13	10	10	11	11	12	8	13	10	11.38	1.06
JCU	10			11	16	18	16	19	6	19	10	15.00	3.69
LAT	11			9	15	12			4	15	9	11.75	2.50
MACQ			21	14	13	14	14		5	21	13	15.20	3.27
MON	15	16	15	10		18	19	9	7	19	9	14.57	3.78
MURD	10	10	10	11	15	14		14	7	15	10	12.00	2.24
NEWC	15	13	12	12	15	14		12	7	15	12	13.29	1.38
QUT	13	17	14	10	18	18	19	19	8	19	10	16.00	3.30
RMIT	16	17	16	12	16	14	11	11	8	17	11	14.13	2.47
SCU	12	12	11			9	9	10	6	12	9	10.50	1.38
SWN	16	13	12	7	9			14	6	16	7	11.83	3.31
UADEL	16	14	14	9	16	15			6	16	9	14.00	2.61
UB						12	13	15	3	15	12	13.33	1.53
UCAN	18			18	20	17	18	19	6	20	17	18.33	1.03
UMEL	20	20	21	15	18	19	18	18	8	21	15	18.63	1.85
UNE			13	11			15	17	4	17	11	14.00	2.58
UNSW	20		19	15	20	19	20	21	7	21	15	19.14	1.95
UOW	20	20	20	17	20	20			6	20	17	19.50	1.22
UQ	20	19			16	19			4	20	16	18.50	1.73
USA	11	10		8	12	12	12		6	12	8	10.83	1.60
USC	8	8	13	10	8			9	6	13	8	9.33	1.97
USQ	12	11	10	9	12	11	18		7	18	9	11.86	2.91
USYD	21	20			21	20	16	16	6	21	16	19.00	2.37
UTAS	17	16	16	12	15			15	6	17	12	15.17	1.72
UTS	17	18	18	15	18	14	15	15	8	18	14	16.25	1.67
UWA	16	9	20	14	21	21			6	21	9	16.83	4.79
UWS	10	12	10	7	8	4	8	8	8	12	4	8.38	2.39
VU	8	8	11	8	12			14	6	14	8	10.17	2.56
Yearly and Overal Descriptive Statistics relating to *TRankG*													
Count	30	26	26	30	29	30	24	27	37	37	37	37.000	37.000
Maximum	21	21	21	18	21	21	20	21	8	21	17	19.500	4.792
Minimum	8	8	8	7	7	4	8	8	2	12	4	8.375	0.837
Average	14.800	14.577	14.731	11.533	14.897	15.267	14.417	13.963	6.000	16.946	11.270	14.294	2.277
Sample Std Dev	3.881	4.042	4.065	3.277	4.229	4.017	3.717	3.726	1.453	3.109	3.364	3.312	0.909

Appendix B – Schedule of Higher Education Providers in Australia

	University	State	Classification
1	Australian National University	ACT	G08
2	The University of Canberra	ACT	Other
3	Australian Catholic University	Multiple	Other
4	Charles Sturt University	Multiple	Other
5	The University of Notre Dame Australia - *Not included in final sample*	Multiple	Other
6	Macquarie University	NSW	Other
7	Southern Cross University	NSW	RUN
8	The University of New England	NSW	RUN
9	The University of New South Wales	NSW	G08
10	The University of Newcastle	NSW	IRU
11	The University of Sydney	NSW	G08
12	The University of Technology, Sydney	NSW	ATN
13	The University of Western Sydney	NSW	Other
14	The University of Wollongong	NSW	Other
15	Batchelor Institute of Indigenous Tertiary Ed. - *Not included in final sample*	NT	Other
16	Charles Darwin University	NT	IRU
17	Bond University - *Not included in final sample*	QLD	Other
18	Central Queensland University	QLD	RUN
19	Griffith University	QLD	IRU
20	James Cook University	QLD	IRU
21	Queensland University of Technology	QLD	ATN
22	The University of Queensland	QLD	G08
23	The University of Southern Queensland	QLD	RUN
24	The University of the Sunshine Coast	QLD	RUN
25	Carnegie Mellon University - *Not included in final sample*	SA	Other
26	Flinders University	SA	IRU
27	The University of Adelaide	SA	G08
28	The University of South Australia	SA	ATN
29	University College London - *Not included in final sample*	SA	Other
30	The University of Tasmania	TAS	Other
31	Deakin University	VIC	Other
32	Federation University - (Previously The University of Ballarat)	VIC	RUN
33	La Trobe University	VIC	IRU
34	Monash University	VIC	G08
35	Royal Melbourne Institute of Technology	Vic	ATN
36	Swinburne University of Technology	VIC	Other
37	The University of Melbourne	VIC	G08
38	University of Divinity - *Not included in final sample*	VIC	Other
39	Victoria University	VIC	Other
40	Curtin University	WA	ATN
41	Edith Cowan University	WA	Other
42	Murdoch University	WA	IRU
43	The University of Western Australia	WA	G08

Chapter 3

The relation between CEOs' compensation and performance of Government Business Enterprises

1 Introduction

Similar to other western economies, Australian Federal and State Government owned Business Enterprises (GBEs)[87] have gone through significant changes over the last three decades. These changes are typically summarised under the heading of "New Public Management" (NPM) (Hood, 1989; Lane, 2000; Gruening, 2001) and, amongst other things, it has resulted in the corporatisation and commercialisation of GBEs[88] (Hoque and Moll, 2001). This process arguably started in the 1980's (Kajimbwa, 2013) under the Thatcher Government in Great Britain and has since been adopted by many developed and developing countries.[89]

The objective of NPM has been and continues to be the enhancement of the economic efficiency and effectiveness of the public sector (Brignall and Modell, 2000). The intention has been the creation of GBEs that operate in a manner that is consistent with managerial practice and governance characteristics utilised in the corporate sector. Further, the transformation of government business along commercial lines has led to the development of compensation structures for Chief Executive Officers (CEOs) and senior executives, which mirror compensation structures in the corporate sector.

A "controversial" outcome associated with NPM implementation, has been the deregulation and subsequent abnormal growth in CEO compensation (Sibillin, 2011). Compared to traditional public sector bureaucratic salary structures, compensation for

[87] Government Business Enterprises (GBE) are also referred to State Owned Enterprises (SOE) or State Owned Corporations (SOC) or Public Trading Enterprises (PTE).

[88] Some of these Australian GBEs, have subsequently been privatised, for example, Qantas, Telstra, Medibank, Commonwealth Bank.

[89] NPM policy has been globalised with adoption initially in Organisation for Economic Co-operation and Development (OECD) nations. This was followed by, due to the influence of international agencies (World Bank, International Monetary Fund, World Trade Organisation, Asian Development Bank, African Development Bank, Inter-American Development Bank, United Nations Development Programme) imposing market based public sector reforms based on NPM principles in Asia, Africa, Latin-America as well as transitional societies in Eastern Europe (Haque, 2004).

CEOs of GBEs has increased significantly in both absolute amounts as well as in relative growth. Over the period 2006 -2013, the growth in CEO compensation amounted to 9.29% per annum[90], which is more than double the growth in average annual earnings of the Australian population.[91] These above average increases are assumed to be driven by improved performance as measured by the efficient generation of the outputs of GBEs (Frey, Homberg and Osterloh, 2013). Although prior studies have investigated pay-for performance in the public sector (Weibel et al., 2009; Hasnain et al., 2014), I am not aware of any empirical evidence which has specifically addressed the pay-performance relation of CEOs in commercially transformed GBEs.[92]

Accordingly the objective of this chapter is to provide evidence on whether the compensation of CEOs in GBEs is driven by publicly available and independently verifiable financial performance measures. As many GBEs do not disclose if their CEOs have specific performance targets, accounting based measures of performance are used to investigate the association between GBE performance and CEO compensation both in terms of levels and changes after controlling for Community Service Obligations (CSOs), if any, of GBEs.

There are a number of motivations for this study. First, GBEs represent a significant proportion of the Australian economy. For example, during the period 2006-2013, the average total assets "of all levels of Government Public Non-Financial Corporations" represented approximately 28% (approx. $368 billion) of GDP.[93] Further, Government

[90] As per the Remuneration and or Related Party transactions disclosed in the annual reports of Federal and State owned GBEs as per the sample used in this chapter - refer Table 4.
[91] As per Australian Bureau of Statistics (ABS) (2015) report 6302.0 – Average weekly Earnings.
[92] As some GBEs may have community service obligations (CSOs) that may impact on their financial performance, an indicator variable has been included in the study to measure the impact of CSOs.
[93] ABS Tables, 55120DO069_201314 Government Finance Statistics, Australia, 2013-14; 55120DO033_201314 Government Finance Statistics, Australia, 2013-14, Table 3 Total all levels of Government Public Non-financial Corporations Balance Sheet; 5206.0 Australian National Accounts:

Public Non-Financial Corporations revenues and dividend distributions over the same period represented 5.35% (approx. $70 billion) and 0.5% (approx. $6.1 billion) of GDP respectively.[94] Accordingly, governments and society in general have a vested interest in ensuring the effectiveness of asset utilisation, efficiency in revenue generating capabilities and the maximisation of dividends it receives from GBEs. Consequently, both the government and board of directors need to ensure that CEO remuneration practices are designed to achieve optimal outcomes in accordance with legislative requirements.

Second, in Australia, most infrastructure development and operations, including ports, roads, rail, water, electricity amongst others, are traditionally managed as separate government sub-units or departments that form part of a larger industry related ministerial portfolio. Historically, the operation and management of these infrastructure projects were based on public sector bureaucratic and administrative practices using regulated CEO compensation structures with the ultimate responsibility for performance resting with the relevant minister.[95] The foundations of NPM are based on the decentralisation and transformation of GBEs utilising corporate sector governance and management structures with the objective being to improve efficiency and effectiveness. In order to achieve these gains, a major departure from the traditional form of public service bureaucracy has been the deregulation of CEO and senior executive compensation so as to enable the attraction of managerial talent. This paper investigates and provides

National Income, Expenditure and Product Table 34. Key Aggregates and analytical series, Annual - Gross domestic product: Current prices.

[94] ABS Tables, 55120DO069_201314 Government Finance Statistics, Australia, 2013-14; 55120DO033_201314 Government Finance Statistics, Australia, 2013-14, Table 1 and Table 2 - Total all levels of Government Public Non-financial Corporations Income Statement and Cash Flow Statement; 5206.0 Australian National Accounts: National Income, Expenditure and Product Table 34. Key Aggregates and analytical series, Annual - Gross domestic product: Current prices.

[95] The GBE traditionally is operated as a sub-unit of a minister's portfolio with the ultimate decision authority being the minister. The minister bears the responsibility for general government as well as all the sub-units comprising the portfolio. The corporatisation of GBEs enabled the transfer of accountability and responsibility to an independent board of directors.

evidence on whether CEO compensation of GBEs is tied to performance and, hence, supports the objectives for creating the GBEs.[96]

Based on hand collected data for a sample of 432 GBE years between 2006 and 2013 (inclusive), the results do not provide evidence of a systematic relation between CEO pay and changes in pay that are related to accounting based financial performance metrics. The only explanatory factor that is found to consistently explain CEO pay levels is GBE size as measured by both revenues and / or total assets. CEO pay is also positively associated with movements in board compensation. These results are consistent for both GBEs affected by CSOs as well as those GBEs that do not have CSOs.

This chapter makes a number of important contributions. First, it adds to the academic literature on CEO compensation in a unique setting. The transformation of public sector services into GBEs has led to the deregulation of salaries of these organisations and, consistent with corporate sector practice, has resulted in significant increases in the levels and growth of CEO compensation (Sibillin, 2011; Smith and Chittenden, 2007). This paper provides evidence on whether the levels of and changes in CEO compensation support the objectives of government policy in relation to the creation of GBEs.

Second, in contrast to corporate sector practice, GBE strategy, objectives and governance structures may be impacted by political influences due to their ownership structure[97] and societal responsibilities.[98] Whilst there have been numerous studies in the corporate sector examining the determinants and effectiveness of corporate boards (Murphy, 2013; Adams et al., 2010; Bebchuk and Fried, 2003) and their impact on executive compensation, these

[96] The objective being the enhancement of efficiency and effectiveness of government business operations.
[97] The shareholders are usually the Treasurer and the responsible minister, which may change at any time due to a change of government or a cabinet reshuffle.
[98] Essential services comprising water, electricity, gas, roads, transport and postal are billed based on a user-pay commercial system and in many instances are subject to regulated pricing.

results may not be applicable to GBEs. For example, unlike corporate sector boards, the boards of GBEs can only recommend levels and changes to CEO compensation that subsequently requires the approval of the shareholder minister.[99] This situation relieves the board of the ultimate responsibility for the approval of CEO compensation, which is inconsistent with corporate sector governance practice. Based on the evidence of these results, policy makers may consider a more enhanced role for the boards in setting CEOs' compensation.

The rest of this chapter is set out as follows. The next section presents the literature review and theory development. Section 3 describes the sample and data used in the study and details the research design. Section 4 reports the main results of the study, section 5 details the results of sensitivity analysis tests and the conclusions are detailed in section 6.

2 Institutional setting and hypothesis development

2.1 Institutional setting

In Australia, the transformation of separable government business activities, under the umbrella of NPM gained traction in the 1980s. This resulted in successive federal (Commonwealth) governments, irrespective of political persuasion, passing legislation[100] enabling the creation of GBEs as separate legal entities. This process was then replicated across all Australian states and territories.[101] The legislation enabled both Commonwealth and state governments to corporatise and commercialise traditional public sector

[99] The shareholder minister(s) are temporary appointments as determined by a shift in personnel for portfolio responsibility and/or the possibility of a change in government.
[100] Australian Government, Government Business Enterprises (Miscellaneous Reforms) Act 1988.
[101] The Australian Capital Territory passed legislation in 1990 enabling the creation of 'Territory Owned Corporations'(TOCs); New South Wales in 1989 enabling the creation of State Owned Corporations' (SOCs); Queensland in 1993 and the Northern Territory in 2014 enabling the creation of 'Government Owned Corporations' (GOCs); Tasmania in 1995 and South Australia in 1996 enabling the creation of Government Business Enterprises (GBEs); Victoria in 1992 enabling the creation of State Owned Enterprises (SOEs) and Western Australia in 1916 with the passing of the 'State Trading Concerns Act'.

activities. This resulted in the transformation of large bureaucratic government departments into smaller, decentralised government owned business units utilising management structures and governance processes replicating practices employed in the corporate sector. Under NPM philosophy, it was generally accepted that corporate sector management practice, governance structures and processes result in a more efficient utilisation of resources than the traditional public sector, multi-layered government administrative bureaucracies (Felts and Jos, 2000).

The principles of corporatisation and commercialisation were applied in those situations where a unique identifiable consumer or geographic market existed. This enabled the transfer of authority, accountability and responsibility to an independent board of directors under the umbrella of a separate, legally incorporated entity or unincorporated business agency operating on a commercial basis. The main industries in Australia affected by the commercialisation process included electricity generation and distribution, forestry, gas, water and transport infrastructure. Prior empirical studies confirm that NPM reforms resulted in lower rates (as opposed to higher rates) of input per unit of output, thereby enhancing efficiencies overall (Andrews, 2011). The efficiency gains of GBEs are presumed to be the result of the commercialisation of operations utilising governance processes that emulate the corporate sector.

Additionally, GBEs in most instances operate in those sectors in which there is a natural monopoly and their creation in many instances was based on the provision of critical infrastructure irrespective of the economics of their creation. To hand over a monopoly

product, market or critical infrastructure[102] to a commercial organisation with a profit objective may lead to unfavourable electoral outcomes for the government of the day.

Hence, the main reasons for not privatising GBEs are: (i) Governments do not want to hand monopolies to private operators and (ii) political reasons due to electorate expectations about service levels, pricing and profitability concerns. This was reinforced in the 2017 Western Australian state elections where the sitting Liberal Government lost an election and one of the key issues the sitting government took to the electorate was the privatisation of the electricity generation and distribution network (Taylor, P., 2017). Consequently there is a perception in the community that critical infrastructure in monopoly situations are best kept under government ownership and operated as a separate GBE due to the efficiency and effectiveness advantages associated with corporatisation and commercialisation.

Accordingly, the government is in a much better situation to provide and control for CSOs and in many instances the CSOs provided by GBEs were shown in the annual report of the GBEs as a "revenue" line item[103] due to the government reimbursing the GBE for revenue foregone as a result of consumer subsidies provided in the form of CSOs. Hence, it is not unreasonable to use profit measures to assess the pay / performance relationship of CEOs of GBEs even in those situations where the GBE is subject to regulated pricing as detailed by the legislative requirements applicable to GBEs as described below in section 2.1.1 below.

[102] Critical Infrastructure assets include water and sewerage, power generation and distribution networks, maritime and transport assets.
[103] Sydney Water Corporation Annual Reports; Queensland Bulk Water Supply Authority T/as SEQ Water annual reports.

2.1.1 Legislation specifying the Objectives of GBEs

The Australian Government's 'Public Governance, Performance and Accountability Act 2013' (PGPA Act 2013), Section 5 states, "*The objects of this Act are: (a) to establish a coherent system of governance and accountability across Commonwealth entities; and (b) to establish a performance framework across Commonwealth entities …… (d) to require Commonwealth companies to meet high standards of governance, performance and accountability."*

Further, in the Australian Government Department of Finance publication, "Resource Management Guide No. 126 (RMG 126) 'Commonwealth Government Business Enterprise Governance and Oversight Guidelines' (August 2015)" it is stated on page 3:

"1.8 A principal objective for each GBE is that it adds to its shareholder value. To achieve this it should:

a. operate efficiently, that is, at minimum cost for a given scale and quality of outputs

b. price efficiently (i) …taking into account economic forces, including the level of demand for, and the enterprise's capacity for and cost of supplying, individual goods and services ….. (ii) the Government may impose price conditions on GBEs providing goods and services in a monopolistic market or Community Service Obligations (CSOs). … in addition to those arising from regulation by the Australian Competition and Consumer Commission…

c. earn at least a commercial rate of return, given the obligations in (a) and (b) above to price and operate efficiently: (i) This means

> recovering the full cost of the resources employed, including the cost of capital (ii) Working towards a principal financial target and a dividend policy, agreed in advance with the Shareholder Ministers" (Australian Government, PGPA Act 2013, pages 3-4).

The legislation specifying the achievement of financial targets provides the foundations for evaluating GBE business operations and management performance utilising efficiency measures extracted and based on the financial reports prepared using Generally Accepted Accounting Principles (GAAP). However, the specifications of financial targets are rarely disclosed in advance. The objectives, targets and performance measurement systems as specified by the Commonwealth government are also evident in the legislation created by the individual states and territories in Australia, which comprise an additional eight jurisdictions.[104]

2.1.2 Legislation with respect to Ownership Structure and Responsibility for GBEs

Australian Government Resource Management Guide No. 126[105] (RMG 126, page 3) states that **"**ownership interest is generally represented by two 'Shareholder Ministers'… being the responsible minister for the GBE and the Finance Minister …," who then report to parliament on the performance of the GBEs. In the same document, it is stated that the

[104] ACT Parliament, Territory-owned Corporations Act 1990. Northern Territory of Australia, 'Government Owned Corporations Act 2014'. New South Wales Government Australia, State Owned Corporations Act 1989. Queensland Government, Government Owned Corporations Act 1993; South Australian Government, "Government Business Enterprises (Competition) Act 1996'. Tasmanian Government, 'Government Business Enterprises Act 1995'. Victorian Government, State Owned Enterprises Act 1992. Western Australia, 'State Trading Concerns Act 1916.'

[105] Australian Government, Department of Finance, Resource Management Guide No. 126, "Commonwealth Government Business Enterprise – Governance and Oversight Guidelines.

responsibility for operations, performance[106] and governance[107] of the GBE is delegated to the Board of Directors.

Similar ownership structures and responsibilities are also evident in the legislation of the states and territories. Irrespective of the type of institution structure, whether incorporated or unincorporated, the responsibility and accountability lies with the Board of Directors, with the shareholder minister(s), as owner(s), possessing the power to override any board decision. To date, although there have been incidents of direct shareholder minister intervention into GBE activities (Ackerman, 2006), these interventions were not related to board or CEO compensation matters.

The legislation has enabled the deregulation of the compensation paid to GBE directors, chief executive officers (CEOs) and senior executives (Australian Government, 2011).[108] This has facilitated the *"*setting of performance targets in terms of acceptable rates of return … giving management more autonomy and at the same time making them more accountable for performance" (Queensland Treasury, 2010, page 10). Hence, it is not unreasonable to utilise accounting based performance measures relating to profitability and asset utilisation for ex-ante setting of goals and ex-post evaluation of both business and managerial performance (Guthrie, 1998).

The corporatisation and the accompanying governance changes for GBEs has resulted in empowering the board of directors, subject to ministerial approval, to appoint the CEO utilising fixed term contracts using unregulated compensation structures that may

[106] Australian Government RMG 126 - Principle 1.6 states "Boards have ultimate responsibility for the performance of the GBE, and are fully accountable for this to the Shareholder Minister(s)."
[107] Australian Government RMG 12 - Principle 2.2 states "Boards should implement effective governance frameworks to support their role and responsibilities, and report on their implementation in the Annual Report."
[108] Australian Government, Department of Finance and Deregulation (October 2011), 'Commonwealth Government Business Enterprise, Governance and Oversight Guidelines' (pages 13, 32).

incorporate a bonus payment based on the achievement of predefined performance targets (which in most cases are not disclosed in the annual report, ex-ante nor ex-post). Alternately, the ability of the board to retain and attract highly qualified CEOs' has necessitated rises in the level and growth of CEO compensation.

In summary, the commercial operations of government were decoupled from general government as separate legal entities with independent boards being accountable and responsible for its management and operations. This process necessitated the development of management and governance structures based on commercial practice with the objectives of:

(i) removing political influences imposed by the government of the day,

(ii) reducing costs associated with bureaucratic administrative and operational structures, thereby enhancing the efficiency of activities undertaken in the delivery of service,

(iii) introducing operational and financial performance measures with the aim of reducing the quantity of inputs per unit of output (Australian Government, 2015; Osborne and Gaebler 1992), and

(iv) encouraging competition in those situations where end markets are large enough and / or barriers to entry were low as competition is deemed to impact positively on efficiency.[109]

The separation of ownership from management yields an agency construct requiring oversight that is usually provided by the governance structures employed in and based on corporate sector ideology.

[109] Queensland Treasury 2010 – 'Commercialisation of Government Business Activities in Queensland', Policy Framework, (pages 10 – 11).

2.1.3 Legislation covering the Reporting Requirements of GBEs.

The Public Governance , Performance and Accountability Act (PGPA) 2013, Section 41 sub-section 2 states, "The annual financial statements must: (a) comply with the accounting standards and any other requirements prescribed by the rules; and (b) present fairly the entity's financial position, financial performance and cash flows. …" and section 46 subsection (1) specifies that "After the end of each reporting period for a Commonwealth entity, the accountable authority of the entity must prepare and give an annual report to the entity's responsible Minister…"

Australian Government RMG 126 states in "Part 3 – Planning and Reporting" that in addition to satisfying the PGPA Act requirements, GBEs in the preparation of their Financial Statements must comply with the requirements of the Corporations Act (2001). Section 295-(4)(ca) of the Corporations Act (2001) under the heading of "Directors' Declaration" require directors to make "an explicit and unreserved statement of compliance with international financial reporting standards" in addition to the requirement that the applicable accounting standard were used in the preparation of the financial statements.[110]

2.2 Corporate Governance Mechanisms of GBEs

In Australia, the governance structures imposed by legislation on GBEs are consistent with those applicable in the corporate sector. Further, it is usual practice for the shareholder minister to delegate authority to the board for operations including CEO appointment, succession, termination and remuneration subject to ministerial approval.[111]

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[110] The legislation relating to annual and financial reports as detailed above are also incorporated into the legislation for the States and Territories in Australia and are applicable to both incorporated and unincorporated GBEs.

[111] Australian Government Department of Finance publication, "Resource Management Guide No. 126 (RMG 126) 'Commonwealth Government Business Enterprise Governance and Oversight Guidelines' (August 2015)" paragraphs 2.7 to 2.11 (pages 5-6).

The need for ministerial approval allows the possibility that CEO appointments may be influenced by the applicants' political status or their political affiliation.[112] Consequently, the shareholder minister(s) has the power to override any decision, including CEO appointment or dismissal, made by the board in relation to the operation of the GBE. Unincorporated GBEs or agencies that have been commercialised also utilise governance and management structures based on corporate sector practice. Once again, it is the responsible government shareholder minister(s) who appoint the board of directors, who then appoint the CEO.

There is an abundance of interrelated legislation that is applicable for the creation, governance and management of GBEs at both the Commonwealth and State level. Although a comprehensive legal analysis is outside the scope of this chapter, the common theme and intention of the legislation is to adopt corporate sector style management and governance structures. The commonality and main features of the Commonwealth and State legislation in relation to governance are detailed in the next sub-section.

2.2.1 Legislation relating to Board Appointments

Australian Government RMG 126, paragraph 2.3 states that the Shareholder Minister(s) is/are responsible for the appointment of the Board as well as determining the "term of appointment" and "remuneration arrangements." The main departure from corporate sector governance is the overriding power of the shareholder minister(s). Further, RMG 126, paragraph 2.18 states that "The Shareholder Minister(s) may, at their discretion,

[112] In Australia there are three main political parties, namely the Liberal, Labor and Green party with a number of independents who under certain conditions may wield the balance of power for one of the major parties. Appointments may be made on the basis of the ex-politician's status irrespective of their affiliation or it may be a result of their political affiliation. That is, a Labor government may appoint ex-Liberal politicians and vice versa (for example, Peter Costello in December, 2009, ex treasurer and retired politician from the Liberal government being appointed by a Labor Government to the board / chairman of the Australian Government Future Fund).

remove directors at any time prior to the completion of their term of appointment" (Davies 2015; Bibby et al., 2010).

The legislation relating to board appointments, remuneration and terminations as detailed above are replicated in the eight State and Territory jurisdictions and apply to both incorporated and unincorporated GBEs. For example, the 2013 Annual Report of Australia Post (Commonwealth GBE) under the heading of "The Board" on page 44 states that "Non-executive directors are nominated by the portfolio minister and appointed by the Governor-General for a period of up to five years." Similarly, the 2013 Annual Report of Sydney Water (State GBE) states on page 49 "All members of the Board of directors … are appointed by the shareholders for terms of up to five years," with shareholders being the responsible minister(s).

2.2.2 Legislation covering the Appointment of the CEO of GBEs.

Australian Government RMG 126 (page 6) states:

> "2.8b(v.) - Through the Chair, the board should advise the Shareholder Minister(s) about its preferred candidate for the position of CEO. The CEO is directly accountable to the board and it is expected that potential candidates would be identified through public advertising or executive search processes.
>
> 2.9 The Shareholder Minister(s) may elect to appoint a candidate not proposed by the Chair."

The board recommendation and ministerial approval requirement for the appointment of CEOs are replicated, if not in exact words, but by intent in the legislation of the eight jurisdictions comprising the States and Territories of Australia and are applicable to both incorporated and unincorporated GBEs. Hence, in GBEs there is the emergence of a

multi-tiered agency relationship comprising the public, the government of the day, the shareholder minister(s) of the day and the board of directors running an organisation that has no direct residual equity ownership rights.

2.2.3 Legislation covering the Remuneration of Directors

Australian Government RMG 126 states, "Part 2.14 - The (Remuneration) Tribunal determines remuneration for directors that is compatible with their roles and responsibilities." The Tribunal, in setting directors fees "may take into consideration a range of information including but not limited to the workload and work value of the office, fees in the private sector, wage indices and other economic indices and rates set for other bodies" (Australian Government RMG 126, page 7). The Commonwealth legislation gives overriding power to the shareholder government minister(s) as does the State and Territory legislation which also require ministerial approval for the determination of director's fees.

Evidence of the amounts paid as Directors' fees including chairperson compensation should be disclosed in the Annual Reports of GBEs.[113] However, not all GBE's disclose this information.[114] In addition to directors being paid for board membership, payments are also made for sitting on board sub-committees.[115] Further, although gross board compensation is disclosed, in many instances individual board member compensation and chairperson compensation is not disclosed separately. [116]

[113] The annual report of Australia Post for the 2012 year (page 46) states under the heading "Director remuneration" that the "Remuneration for Australia Post's non-executive directors is determined by the Commonwealth Remuneration Tribunal."
[114] Ausgrid, NSW; Gladstone Area Water Board, Qld, etc.
[115] Australia Post, Annual Report, 2012 (page 96).
[116] The Annual Report of Sydney Water under the heading "Board of Directors" specifies that "Each non-executive director's remuneration is set by the shareholder(s)" but gives no disclosure of payments made to individual directors (page 81 of 2013 financial report or page 143 of 2013 Annual Report).

2.2.4 Legislation covering the Remuneration of CEOs.

Australian Government RMG 126 states in Part 5.1 that "the CEOs of GBEs are covered by the Remuneration Tribunal's Principal Executive Offices (PEO) Classification Structure."[117] Commonwealth[118], State[119] and territory legislation delegates the determination of CEO compensation to the board of directors, and as the employing body, may determine remuneration for the office, consistent with the PEO framework. The Tribunal may seek the views of Shareholder Minister(s) prior to agreeing to any new or changed arrangements to these packages. However, the Tribunal rarely overrules the recommendation of the minister, who rarely overturns the recommendations of the board of directors (Sibillin, 2011).

The move from traditional regulated public sector salary structures to deregulated CEO compensation for GBEs has resulted in higher absolute amounts as well as higher growth rates for CEOs of GBEs as compared to average earnings in Australia[120] (Sibillin, 2011) and overseas (Johnston, 2014; Branigan, T., 2006).

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[117] The Government first created the designation of Principal Executive Office (PEO) when it introduced reform measures for Government Business Enterprises (GBEs) in 1988. The designation of the Chief Executive as a PEO allowed the Board of a GBE to set remuneration for that office. Boards were expected to consult the Remuneration Tribunal before any remuneration changes were implemented. *Australian Government Remuneration Tribunal*- (http://www.remtribunal.gov.au/offices/principal-executive-offices/principal-executive-office-background).

[118] Australia Post annual report for 2013 on page 46 states under the heading of 'Executive Remuneration' that 'The board is responsible for setting the remuneration and it follows a set of principles approved by the Commonwealth Remuneration Tribunal which are designed to link the level of remuneration with the financial and operational performance of the corporation'.

[119] The annual report of Queensland Rail for 2013 on page 61 states under the heading 'Principle 8 – Remunerate fairly and responsibly' states 'The Board has established a People and Safety Committee that, among other things, reviews Queensland Rail's remuneration framework…. The Committee assists the Board by reviewing and providing recommendations on the recruitment, retention, remuneration and performance measurements of the CEO…'

[120] Australian Bureau of Statistics, (2015); '6302.0 Average Weekly Earnings, Australia. Series ID A85002157R

Earnings; Persons; Total earnings.'

2.2.5 Legislation specifying Performance Measures and Community Service Obligations

Australian Government RMG 126, section 3 (table 4, page 12) specifies performance measures to be reported in relation to (i) financial (ii) business efficiency (iii) leverage / solvency (iv) customer and stakeholders and (v) staff. These performance measures require the use of information included in financial statements prepared in accordance with applicable accounting standards. Examples of financial performance measures listed include Total Shareholder Return, Dividend yield, Return on Capital Employed etc. In the preparation of the annual report, paragraph 3.13(a) page 14, states that "The annual report of GBEs must also include an Annual Performance Statement." Paragraph 3.13(c) requires the inclusion of "comments on performance against the financial and non-financial expectations outlined in the Corporate Plan for publication relating to that financial year …" Independent verification of the accounts are specified in paragraph 3.15 stating that "financial statements of GBEs …. are to be audited and reported on, by the Auditor-General."[121]

Management responsibility and accountability is measured similar to the corporate sector, utilising quantifiable performance measures provided in audited financial statements (Fowles, 1993; Humphrey, et al., 1993). GBEs operating under the NPM reforms are shaped and driven by market oriented financial controls that are facilitated by the use of financial statement numbers (Ezzamel and Willmott, 1993).

However, there are instances where the GBEs' performance may be adversely affected by government imposed community service obligations (CSOs) incorporated in their charter. These CSOs affect performance in those situations where services are required to

[121] Performance measurement and reporting utilising audited financial statements are also required under State and Territory legislation and in all cases incorporate financial performance measures prepared using accrual accounting and complying with applicable accounting standards.

be provided even if it is a loss making activity. For example, discounted rates for pensioners and people suffering disability negatively impact on revenues. Further, Australia Post have uniform pricing for mail delivery regardless of the remoteness of the destination location and the associated delivery cost. Hence the resulting accounting performance measures for GBEs with CSOs are impaired and whether this affects levels and growth in CEO compensation is tested. Consequently an indicator variable for GBEs with CSOs has been included to test whether GBEs with CSOs pay their CEOs less.

Prior research in the corporate sector utilise metrics extracted from financial statements, coupled with market based measures to investigate the pay-performance relation of CEOs (Matolcsy and Wright, 2011; Core et al., 1999). Accordingly, the use of accounting numbers extracted from financial statements provide the foundations for the evaluation of the pay-performance relation of CEOs of GBEs with the one exception being the absence of periodic movements in the market valuation of ownership.

2.2.6 Summary of Governance Legislation

The Joint Committee of Public Accounts (JCPA 1995, page 150), under the heading of Ministerial Responsibility, described the chain of accountability as follows:

> "Staff of a GBE are accountable to management who are in turn accountable to the board of directors. The directors, individually and collectively, are accountable to the relevant portfolio minister who, in turn, is accountable to Parliament for the performance of GBEs in that portfolio."

The clear lines of responsibility and accountability are supported by legislation that specify the governance requirements associated with the management and operation of GBEs. The fact that the responsible minister(s) has/have overriding power may lead to actions that override good governance for political gain or bias (Davies, 2015; Ackerman, 2006).Alternately, the responsible (shareholder) minister(s) may be too busy with other

ministerial portfolio responsibilities as well as having only temporary shareholder responsibilities and status.[122] In either case, it is a departure from corporate sector governance practice. Good governance "refers to the set of mechanisms that influence the decisions made by managers when there is a separation of ownership and control" (Larcker et al., 2007, p.964). In the corporate sector, the agency construct, the principal being the shareholder, has a direct economic interest that fluctuates in value as determined by market forces (Grosse et al., 2015). Although agency constructs are applicable to both GBEs and corporate sector firms in terms of board and management structure, the major differences in governance relate to the authority, ownership and participation role of the principal(s), coupled with the absence of market based control mechanisms.

2.3 Political Interference in the Corporate Governance Mechanism of GBEs

Although one of the objectives of NPM is to remove politics from administration, especially for GBEs that have been corporatised and commercialised, this has not always been the case as evidenced in board appointments for both Commonwealth and State GBEs (Davies, 2015; Salusinszky and Hepworth, 2010). A newspaper article titled "Coalition government appoints its political friends and colleagues to boards", disclosed that there have been "…more than 50 appointments of ex- Liberal or National politicians, relatives of politicians, or prominent conservative thinkers since October 2013 after the Coalition government came to power" (Davies, 2015). Although appointments are supposedly based on expertise, it is not unusual for board appointments to be made on the basis of political affiliations and / or political reputation. Additionally, it is not uncommon for politicians who lose their seat in an election or who retire from parliament to be appointed to boards of GBEs (Davies, 2015). Consequently, political interference in the

[122] Temporary status may relate to a reshuffle of portfolio responsibilities or change of government, etc.

appointment of board members may have implications that compromise effective monitoring.

Both Commonwealth and State legislation give overriding authority to the shareholder minister(s), who has/have the power to overturn or reject any board recommendation. As stated in Australian Government RMG 126, paragraph 2.18, page 7:

> "The Shareholder Minister(s) may, at their discretion, remove directors at any time prior to the completion of their term of appointment."

The power of the shareholder minister(s) to appoint or remove directors was evidenced in 2010 when the NSW Government Treasurer, Eric Roozendaal, after a major disagreement with the board over the proposed sale price for the privatisation of two state-owned electricity companies replaced the majority of board members. New board members were appointed within a twenty-four hour period and the new board members subsequently approved the discounted sale price of these GBEs (Bibby et al., 2010). In November 2006, the NSW Treasurer, Mr Michael Costa replaced the Chairman of TransGrid (a state owned GBE), Mr Phillip Higginson, for refusing to withdraw his nomination of TransGrid CEO Kevin Murray as TransGrid's representative on the board of EISS[123] instead of Treasurer Costa's preferred nomination of former TransGrid CEO, David Croft (Ackerman, 2006). In summary, the relevant minister of a political party in power at any given time may interfere with the corporate governance mechanism of GBEs.

[123] Electricity Industry Superannuation Scheme.

2.4 Empirical Evidence on the Pay / Performance relation in the Public Sector

Cutler and Waine (2005) review Performance-Related-Pay (PRP) in the United Kingdom public sector and conclude that there are two problematic aspects associated with the transparency of this practice, the first being (i) the complexity of pay determination and the second comprising (ii) difficulties in finding "unproblematic" performance measures that can be linked with pay. It may be that the decentralisation of responsibility and accountability of GBE operations has led to CEO remuneration practices in the corporate sector being employed in the public sector. This situation, coupled with the market for managerial talent, has facilitated the abnormal growth in public sector senior executive compensation (Sibillin, 2011; Smith and Chittenden, 2007; Branigan, 2006).

Using meta-analysis[124] and a vignette study, Weibel et al. (2009) find that the impact of financial rewards on extrinsic and intrinsic motivation leads to only "modest success of pay for performance in the public sector (page 19)". Their meta-analysis looked at a range of Pay-for-Performance (PFP) behavioural issues in both operational (police, hospitals, teachers etc.) and managerial roles. Their vignette study finds that PFP in some instances undermine performance in so far as it strengthens extrinsic motivation while weakening intrinsic motivation thus producing hidden costs. The hidden costs relate to the decline or loss of intrinsically motivated behaviour being compensated for by external rewards. Hasnain et al. (2014) also utilise a meta-analysis approach and find that PFP for senior administrators is based on subjective performance evaluations due to (i) task complexity, and (ii) difficulties associated with measuring outputs.

To date, public sector research has not directly addressed the pay-performance issue as it relates specifically to the determination of CEO compensation. Further, I am not aware

[124] A meta-analysis uses statistical analytical techniques combining the results of multiple prior studies.

of any prior research that has addressed the pay-performance relation of CEOs in GBEs using large scale statistical evidence. Evidence will be provided in this paper on this issue based on performance measures developed from information contained in the financial statements of the annual reports prepared by GBEs over the period 2006 – 2013 in Australia. As Hopwood (1985, p. 15) concluded, "Accounting seemingly has been seen as a manifestation of sound economic management, of appropriate organisational arrangements and of a commitment to the objective of efficiency." Consequently, the use of financial performance measures represents a core component of NPM in supporting the "philosophical drive for a more 'efficient,' 'effective' and 'accountable' public sector' (Guthrie et al., 2003, page 3).

2.5 Alternative Theoretical Perspectives on the Pay Performance Relation for CEOs of GBEs

There are two alternative theoretical explanations for the CEO pay-performance relation that are applicable to both the corporate and GBE sectors, being (i) efficient contracting based on the principal-agent model (Jensen and Meckling, 1976) and (ii) managerial power leading to board capture (Bebchuk and Fried, 2006,2003,2002).

Agency theory proposes that principals (shareholders) appoint managers who may behave opportunistically in order to maximise their own welfare (Jensen and Meckling, 1976). This agency problem can be mitigated by corporate governance structures that address the issues of ownership, board size and structure and their impact on performance (Core et al., 1998; Hermalin and Weisbach, 1998). One possible vehicle to reduce the conflict between managers and shareholders is to provide incentive based compensation to management.

A major difference between GBEs and firms in the corporate sector is the authority and role of shareholders. The consideration of residual claims gives rise to agency issues that apply to both open (corporate sector) and closed (GBE) ownership forms (Fama and Jensen, 1983). In the corporate sector, shareholders (being the principals) have alienable residual equity ownership rights and are responsible for the appointment of directors. For GBEs, there is no residual equity ownership by the shareholder minister(s), however, the shareholder minister has overriding decision authority over the appointment of board members as well as any decisions made by the board. In both cases, the board has the delegated authority to appoint the CEO and determine remuneration in order to mitigate agency issues and one method of achieving this is by linking pay to performance. The absence of a market for residual ownership, coupled with the overriding authority of the minister over the GBE board, is inconsistent with corporate practice. Hence, it is not obvious that agency theory is the appropriate framework to base a formal hypothesis for investigating the pay performance relation for CEOs of GBEs.

An alternate theoretical approach explaining the determination of CEO compensation in GBEs is the notion of managerial power (Bebchuk and Fried, 2005). The proposition that the CEO is in a powerful position enabling him/her to dominate both the board and its sub-committees[125] gives rise to the notion of "managerial power". Because GBEs have political influence on board appointments (Davies, 2015) and dismissals (Salusinszky and Hepworth, 2010), this may adversely impact on the monitoring relationship between government minister(s), the board and CEO. Given that the GBE may only be a small segment of the overall portfolio minister's responsibility and that board recommendations are unlikely to be overruled by the minister appointing the board, gives rise to the

[125] Includes the remuneration sub-committee.

possibility that the current monitoring practice and governance structures may be inadequate. Hence, it is not unrealistic that the CEO has a high degree of control over the board (board capture) and this control facilitates extracting rents by enabling the CEO to determine his / her own compensation, subject to outrage costs[126] (Bebchuk and Fried, 2005). If the managerial power theory is used to justify the compensation of CEOs of GBEs, then this framework is inconsistent with the intent of NPM.

Given the institutional setting and regulatory framework of GBEs and their CEOs' compensation as discussed in Sections 2.1 – 2.4, neither theoretical framework provides clear guidance for a formal hypothesis. Accordingly, the association between GBEs' performance and their CEOs' compensation is an empirical issue on which evidence is provided in the following sections.

3 Sample, Data and Research Design

Investigating the pay-performance relation based on independently verifiable quantifiable financial measures should provide an insight into the determinants of CEO compensation. At the present time, the only quantitative performance measures available to evaluate this relation emanate from the analysis of the audited financial reports that have been prepared using accrual accounting, supposedly in accordance with applicable accounting standards. As there are a number of performance measures referred to in the legislation that utilise information contained in the financial statements including return on assets (ROA), profit margin (PM), asset turnover or similar measures, it is not unreasonable to use these measures to investigate the pay-performance relation for CEOs of GBEs.[127]

[126] Outrage costs occur due to a public reaction to perceived excessively high levels of executive compensation.

[127] Australian Government RMG 126, (2015) section 3 (table 4, page 12) specifies performance measures to be reported in relation to (i) financial (ii) business efficiency (iii) leverage /solvency (iv) customer and stakeholders and (v) staff.

3.1 Sample

The sample used in this study is based on hand collected data for both Commonwealth (Australian Government) and State and Territory owned GBEs for the years 2006 – 2013 inclusive. In those instances where the remuneration report or the related party transaction note to the accounts did not disclose ascertainable compensation details for the CEO, these observations were excluded. For those GBEs where the CEO was appointed or retired at the start, end or during the year, the outgoing CEO in their final year and the incoming CEO in their first year are excluded due to the non-disclosure of termination payments and sign-on bonuses (Coulton and Taylor, 2002).

The initial sample comprised 115 GBEs with 814 firm year observations as depicted in Table 1.

Table 1 – Sample Construction covering the period 2006 – 2013 inclusive

Sample Selection – Number of GBEs and GBE Years

	GBEs	Observations
1. Number of GBEs - Commonwealth and State (116)	115	814
2. Exclude GBEs and observations where there is no Annual Report	-9	-51
3. Exclude GBEs and observations where there is inconclusive or missing remuneration data	-19	-142
Subtotal	87	621
4. Exclude Observations for Departing CEO in final year		-91
5. Exclude Observations for Incoming CEO in first year		-91
6. Exclude Observations for GBEs where there is less than 2 complete years of operations	-4	-7
Final Sample Size after exclusions	83	432

Observations were deleted due to (i) the non-availability and/or inability to locate annual reports due to the GBEs not being incorporated or discontinuance following amalgamation with other GBEs being 9 GBEs with 51 firm year observations, (ii) the non-disclosure of CEO remuneration in the annual reports of GBEs comprising 19 GBEs with 142 firm year observations, (iii) CEO retirements and new appointments being 182 firm year observations and (iv) the number of observations available for a GBE was less than two complete years representing four GBEs and seven firm year observations. After deletions the sample comprised 83 Commonwealth, State and Territory GBEs and 432 firm year observations as disclosed in Table 1.

Table 2 displays the results for GBEs with and without CSOs.

Table 2 – Classification of Observations by Community Service Obligations

	GBEs	Observations
1. GBEs with CSOs	21	115
2. GBEs with No CSOs	62	317
Final Sample Size after exclusions	83	432

The costs associated with the provision of CSOs of the different GBEs are not always explicitly stated. For example, some GBEs state that they offer discounts for pensioners and people with disabilities but do not disclose the costs of subsidies provided. However, other GBEs, for example, Australia Post, who are obliged to charge a single rate for letter postage irrespective of the remoteness of the location and cost of delivery, clearly state in their annual report the estimated cost of CSOs. Further, in many instances the CSOs were

reported as revenue line items representing government reimbursement for the CSOs incurred. Those GBEs that reported CSOs as revenue in their annual report were classified as GBEs without CSOs.

Accordingly, I have divided the sample into GBEs with and without CSOs either on the basis of explicit legislative requirements of CSOs or where I could ascertain the provision of CSOs from the Annual Reports of the GBEs.

The sample was further classified according to the Global Industry Classification Scheme (GICS) codes. Overall, five GICS Sector codes were identified as relevant. The largest being Electric Power and Water, both being classified as Utilities (GICS Sector 55) with 51.85% of observations.

Table 3 shows the classification of GBEs by GICS sector.

Table 3 – Sample Observations Classified by GICS Sector

Sector	GICS Sector Name	Number of GBEs	Number of Observations	% of Observations
15	Materials	7	38	8.80%
20	Industrials	18	105	24.31%
40	Financials	11	59	13.66%
50	Telecommunications	1	6	1.39%
55	Utilities	46	224	51.85%
		83	432	100.00%

The sample was also classified by jurisdiction comprising Commonwealth, State and Territory regions as well as the subsamples representing GBEs with and without CSOs. The state with the most observations is Victoria (VIC) with 27 GBEs and 141 observations comprising 32.87% of the sample as detailed in Table 4.

Table 4 – Sample Observations by State and CSOs

Number of GBEs and Observations by Jurisdiction and with / without CSOs					
Jurisdictions	Number of GBEs	Number of Observations	GBEs Without CSOs	GBEs with CSOS	% of Observations
Australian Capital Territory (ACT)	3	10	4	6	2.31%
Commonwealth Government	3	18	18	0	4.17%
New South Wales (NSW)	12	69	69	0	15.97%
Northern Territory (NT)	1	4	4	0	0.93%
Queensland QLD	14	71	71	0	16.44%
South Australia (SA)	1	6	6	0	1.39%
Tasmania (TAS)	4	10	10	0	2.31%
Victoria (VIC)	27	142	45	97	32.87%
Western Australia (WA)	18	102	90	12	23.61%
Total	83	432	317	115	100.00%

3.2 Data

Compensation and governance data were hand collected from the annual reports of the GBEs. Financial statement data and operating statistics were also hand collected from the annual reports of the GBEs with the performance measures used based on accounting information.

The determination of the amount of CEO remuneration in situations where the exact amounts are not given are obtained by taking the mid-point of the highest band reported in the remuneration report or the related party note to the accounts. In the absence of information to the contrary, it is assumed that the CEO is the highest paid executive. Remuneration disclosures vary substantially with respect to consistency and quality. Although total remuneration paid to CEOs is ascertainable in most instances, the composition of the remuneration being salary, bonus, superannuation benefits, termination and sign-on payments in many instances were not disclosed separately. Consequently, the total dollar value of CEO compensation was the base used for the

analysis. In 94 observations, bonus details were separately disclosed and these observations are analysed in the sensitivity analysis (part 5) to further investigate the pay-performance relation.

As not all GBEs included in the analysis have the same number of annual observations, the data comprises an unbalanced panel data set. For example, the sample includes two contiguous ranges for Transgrid, a NSW state owned GBE for the years 2006 – 2009 and 2012 – 2013, with 2010 and 2011 being excluded due to a departing CEO in 2010 and an incoming CEO in 2011.

The explanatory variables include three independent measures of performance that are used alternately comprising (i) return on assets *(ROA)* as an overall performance measure, (ii) profit margin *(PM)* as a measure of efficiency and (iii) asset turnover *(ATO)* as a measure of resource utilisation (Australian Government, 2015). Economic variables used to control for size include total revenue *(Ln Total Revenue)* in the main tests and total assets *(Ln Total Assets)* in the sensitivity analysis. Total revenue was deemed to be a more accurate measure to proxy for size as opposed to total assets. Total assets are used as an alternative size measure in sensitivity tests. Institutional and governance controls include board size *(#Board Size)*, which is the total number of board members; percentage of independent directors *(%Indep Directors),* which is the percentage of non-executive directors to total directors and which may include the CEO; and lastly net board compensation[128] (*Ln $Net Board Comp),* which excludes CEO compensation in those situations where the CEO is a board member. Indicator variables used in the tests include: a government grants *(Gov_Grants_Dummy)*, net loss *(Net Loss Dummy)* and regulated price *(Regulated Price Dummy)* and community service obligations *(CSO Dummy)*. The

[128] Net Board Compensation was calculated by deducting Total CEO Compensation from total board compensation in those situations where the CEO was also a board member.

amounts received for government grants are included in total revenues, however, not all GBEs receive government grants, hence the indicator variable *(Gov_Grants_Dummy)* was introduced to examine whether direct government funding impacted on CEO compensation. The net loss indicator variable *(Net Loss Dummy)* was introduced to examine whether a loss affected CEO compensation or changes in CEO compensation. The regulated pricing indicator *(Regulated Price Dummy)* variable was also introduced to examine whether capped pricing of output impacted on CEO compensation and / or changes in CEO compensation. An indicator variable for GBEs with CSOs has been included to test whether GBEs with CSOs pay their CEOs less.

The variables used for the analysis are summarised in Table 5.

Table 5 – Variables used in Empirical tests

Dependent Variables	
Total CEO Compensation	*Ln CEO Total Comp*
% Change in CEO Compensation	*% Δ CEO Comp*
CEO Bonus Payment	*$CEO Bonus*
Independent Variables	
Performance Metrics	
Return on Assets = After Tax Operating Profit ÷ Total (EOY) Assets	*ROA%*
Profit Margin = After Tax Net Profit ÷ Total Operating Revenue	*PM - Profit Margin %*
Asset Turnover = Total Operating Revenue ÷ Total (EOY) Assets	*ATO - Asset Turnover*
Economic Size Controls	
Total Revenue	*Ln Total Revenue*
Total Assets	*Ln Total Assets*
Governance Control Metrics	
Number of Directors	*Board Size*
% Independent Variable (Ind Directors ÷ Total Directors)	*%Indep Director*
Government Grants & CSO *(1 = Gov Grants)*	*Gov Grants Dummy*
Net Board Compensation *(Total Board Comp – Total CEO Comp)*	*Ln $Net Board Comp*
Loss Dummy *(1 = Loss)*	*Net Loss Dummy*
Regulated Pricing Dummy *(1 = Legislated Pricing)*	*Regulated Price Dummy*
Community Service Obligations	*CSO Dummy*

Descriptive statistics for the data are included in Table 6.

Table 6 - Descriptive Statistics

Statistics	Mean	Median	Std. Dev.	Minimum	Maximum	No. Obs.
$CEO Total Comp ($000)	434.5	355.0	381.30	67.5	4,751.8	432
% Δ CEO Comp	9.29%	5.35%	19.43%	-44.31%	196.67%	332
CEO Bonus Compensation ($000)	165.01	67.25	286.66	2.00	1,998.95	94
$Total Revenue ($000)	730,000	214,000	1,170,000	5,938	6,830,000	432
$Total Assets ($000)	2,460,000	986,000	3,430,000	8,442	21,500,000	432
After Tax Operating Profit ($000)	66,400	11,700	199,000	- 1,250,000	1,570,000	432
ROA %	2.61%	2.35%	5.76%	-45.69%	30.35%	432
Profit Margin % (PM)	7.24%	9.23%	27.79%	-294.64%	85.68%	432
Asset-Turnover (ATO)	0.43	0.20	0.61	0.02	3.67	432
Board Size	7	7	1	2	12	432
%Ind Director	90.54%	87.50%	9.38%	50.00%	100%	432
$Net Board Compensation ($000)	291.87	248.80	226.95	23.38	1,440.00	432
Government Grants Dummy	42%	0%	49%	0%	100%	432
Net Loss Dummy	20%	0%	40%	0%	100%	432
Regulated Price Dummy	63%	100%	48%	0%	100%	432
CSO Dummy	27%	0%	44%	0%	100%	432

The average CEO compensation for the period 2006-2013 is $434,766 with a standard deviation of $381,330. The highest paid CEO for the period earned an annual salary of $4,751,831 and the minimum over the same period is $67,500. At the same time, CEO compensation growth is approximately 9.29% per annum, which is more than double the 4.45% growth in average annual earnings.[129]

The performance measures report mean (median) results of 2.61% (2.35%) for ROA, 7.24% (9.23%) for PM and 0.43 (0.20) for ATO. The standard deviation for each performance measure is quite large evidencing volatility in the results. The two economic measures, which are Total Revenue and Total Assets proxy for firm size and resource intensity, display significant dispersion for GBEs resulting from variations in (i) firm size, which may range from national coverage to major capital cities and smaller country

[129] As per ABS report: 6302.0 Average Weekly Earnings - Table 3: reference table A85002151A.

towns and (ii) investment size due to the capital intensity requirements of GBEs. In order to reduce potential skewness, the natural logarithm of CEO compensation, economic size measures and net board compensation are used in the regression models.

The correlations between the variables used to investigate the pay performance relation are reported in Table 7.

Table 7 – Correlation Matrix – PEARSON & *SPEARMAN (above the diagonal)*

	Ln CEO Total Comp	% Δ CEO Comp	ROA %	Profit Margin %	Asset-Turnover	Ln Total Revenue	Ln Total Assets	# Board Size	% Indep Directors	Ln Net Board Comp
Ln CEO Total Comp	1	*0.069*	*0.295**	*0.131**	*0.417**	*0.825**	*0.683**	*0.115**	*-0.021*	*0.626**
% Δ CEO Comp	0.177*	1	*0.106*	*0.095*	*0.055*	*-0.034*	*-0.049*	*0.015*	*0.076*	*-0.087*
ROA %	0.165*	*0.081*	1	*0.767**	*0.528**	*0.164**	*-0.053*	*-0.111**	*-0.019*	*0.133**
Profit Margin %	0.085	*0.054*	0.736*	1	*0.083*	*0.018*	*0.022*	*-0.086*	*-0.002*	*0.102*
Asset-Turnover	0.258*	*0.030*	0.150*	-0.009	1	*0.389**	*-0.081*	*-0.123**	*0.011*	*0.144**
Ln Total Revenue	0.772*	*-0.010*	0.101	0.051	0.258*	1	*0.863**	*0.218**	*-0.050*	*0.664**
Ln Total Assets	0.588*	*-0.043*	-0.055	-0.015	-0.230*	0.843*	1	*0.280**	*-0.066*	*0.635**
Board Size	0.154*	*-0.004*	0.017	0.020	-0.063	0.237*	0.303*	1	*0.134**	*0.260**
% Indep Directors	-0.025	*0.106*	0.076	0.088	0.031	-0.058	-0.083	0.155*	1	*-0.151**
Ln $Net Board Comp	0.582*	*0.007*	0.026	0.021	0.049	0.608*	0.575*	0.189*	-0.213*	1

** Significant at 5% level.*

As expected, the size measures, comparing total revenue and total assets, apart from being highly correlated with each other, also display high levels of correlation with both CEO compensation and net board compensation, thereby indicating that size is a significant factor impacting on both executive and board compensation. Additional significant relationships disclosed in the correlation matrix exist between CEO compensation and Board Size. In addition, the performance measures of ROA, PM and ATO also report that a significant relation exists between these measures and CEO compensation. Both the economic size measures and performance measures are used alternately in the regression testing to avoid potential multicollinearity. Otherwise, there are no variables with correlations exceeding 80% used in the same regression model and, consequently, do not pose multicollinearity concerns.

3.3 Experimental Design

The hypothesis is tested using a series of pooled panel data regressions.[130]

Model (1) examines the association between CEOs' Total Compensation and GBEs' performance based on four alternative performance measures.

$$\textbf{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1\textbf{Performance}_{it} + \beta_2\textbf{Economic Control}_{it} + \beta_3\textbf{Governance Controls}_{it} \quad \textbf{(1)}$$

The dependent variable for Model (1) is the log of total CEO compensation *(ln CEO Total Comp)*. To test the pay-performance relation, the current year's performance measures utilised include (i) *ROA* (ii) *PM* (iii) *ATO* and (iv) *PM & ATO* simultaneously. The economic measure used to proxy for size is Total Revenue *(ln Total Revenue)*. Governance and institutional controls include: the total number of directors *(Board Size)*,

[130] To reduce the impact of heteroscedasticity, log transformed variables for CEO Total Compensation, Total Revenues, Total Assets and Net Board Compensation are used in the regression models *(as opposed to the raw data).*

the percentage of independent directors *(%Indep Directors)*, the government grants indicator variable *(Gov Grants Dummy)*, net board compensation *(Ln $Net Board Comp)*, a net loss indicator variable *(Net Loss Dummy)*, an indicator variable to control for GBEs which are subject to regulated pricing *(Regulated Price Dummy)* and an indicator variable for CSOs *(CSO Dummy)*.

Model (2) examines the association between the percentage change in CEO Total Compensation and the current year change in the GBEs' performance measures, size, net board compensation and indicator variables related to institutional and governance controls.

$$\%\Delta\text{CEO Comp}_{it} = \alpha_t + \beta_1\Delta\text{Performance}_{it} + \beta_2\%\Delta\text{Economic Controls}_{it} + \beta_3\%\Delta\text{Governance Controls}_{it} + \beta_4\text{Governance Controls}_{it} \quad (2)$$

For Model (2) the dependent variable is the percentage change in CEO total compensation *(%Δ CEO Compensation)* calculated as $[(\text{CEO Total Comp}_{t0} - \text{CEO Total Comp}_{t-1}) \div \text{CEO Total Comp}_{t-1}]$. To test the pay-performance relation, current changes in (i) ΔROA $[(ROA_{t0} - ROA_{t-1}) \div (ROA_{t-1})]$ (ii) ΔPM $[(PM_{t0} - PM_{t-1}) \div (PM_{t-1})]$ (iii) ΔATO $[(ATO_{t0} - ATO_{t-1}) \div (ATO_{t-1})]$, coupled with the economic change measure being percentage change in total revenue *(%Δ Total Revenue),* are utilised. Governance controls include: the total number of directors *(Board Size)*, the percentage of independent directors *(%Indep Directors)*, the government grants indicator variable *(Gov Grants Dummy)*, the percentage change in net board compensation *(%Δ$Net Board Comp)*, a net loss indicator variable *(Net Loss Dummy)*, an indicator variable to control for industries subject to regulated pricing *(Reg Pricing Dummy)* and an indicator variable for GBEs with CSOs *(CSO Dummy)*.

Model (3) utilises next year's Performance Measures as the dependent variable to test whether current levels of CEO compensation provide an adequate incentive for improving next year's performance.

$$\textbf{Performance}_{t+1} = \alpha_t + \beta_1 \textbf{ Ln CEO Total Comp}_{it} + \beta_2 \textbf{Economic Controls}_{it} + \beta_3 \textbf{Governance Controls}_{it} \quad \textbf{(3)}$$

Model (3) examines the pay performance relation from an "incentives" perspective, by making next year's performance measure (i) ROA_{it+1} (ii) PM_{it+1} and (iii) ATO_{it+1} the dependent variable and using the current years CEO Total Compensation *(ln CEO Total* $Comp_{t0}$*)* as an explanatory variable. The size measure is Total Revenue *(ln Total Revenue)* and Governance controls include the total number of directors *(#Board Size)*, the percentage of independent directors *(%Ind Directors)*, the government grants indicator variable *(Gov Grants Dummy)* and net board compensation *(Ln $Net Board Comp)*. In addition, a net loss indicator variable *(Net Loss Dummy)*, an indicator variable to control for GBEs subject to regulated pricing *(Regulated Price Dummy)* and an indicator variable for CSOs *(CSO Dummy)* are also included in the test.

The development and analysis of Model (3) may be subject to endogeneity concerns associated with reverse causality. The issue of reverse causality may arise as a result of CEO compensation impacting on performance measures as well as performance measures impacting on CEO compensation. That is, pay drives performance and performance drives pay. To control for endogeneity, an instrumental variable (IV) was developed and introduced and a two stage regression analysis (2SLS) was performed in addition to the ordinary least squares (OLS) regression analysis. The data, process and results are discussed in Section 4.

Model (4) uses changes in Next Year's Performance Measures (t_{+1} - t_0) as the dependent variable with current year's changes (t_0 – t_{-1}) in CEO Compensation, Total Revenue and

governance variables used to test whether the current level of change (growth) in CEO compensation provides an adequate incentive for improvements in next year's performance.

$$\Delta\textbf{Performance}_{t+1} = \alpha_t + \beta_1 \%\Delta\textbf{CEO Total Comp}_{it} + \beta_2 \%\Delta\textbf{Economic Control}_{it} + \beta_3 \%\Delta\textbf{Governance Controls}_{it} + \beta_4\textbf{Governance Controls}_{it} \quad \textbf{(4)}$$

Model (4) analyses if the percentage change in next year's performance measures, which are ΔROA_{t+1}, ΔPM_{t+1} and ΔATO_{t+1} *[calculated respectively as ($ROA_{t+1} - ROA_{t0}$), ($PM_{t+1} - PM_{t0}$) and ($ATO_{t+1} - ATO_{t0}$)]* can be attributed to current changes in CEO Total compensation *(%Δ CEO Compensation)*, changes in the economic measure *(% Δ Total Revenue)* and/or change in the governance measure of Board compensation *(%Δ$Net_Board_Comp)*. The institutional and governance indicator variables are the same as used in Models (1) to (3).

Model (5) and (6) repeat Model (1) and (2) respectively with two additional indicator variables representing the largest[131] industry being Utilities *(GICS code 55)* and the largest State jurisdiction, being Victoria *(VIC)*.

Model (5):

$$\textbf{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1\textbf{Performance}_{it} + \beta_2\textbf{Economic Control}_{it} + \beta_3\textbf{Governance Controls}_{it} + \beta_4\textbf{Industry}_{it} + \beta_5\textbf{State}_{it} \quad \textbf{(5)}$$

Model (6):

$$\%\Delta\textbf{CEO Comp}_{it} = \alpha_t + \beta_1\Delta\textbf{Performance}_{it} + \beta_2\%\Delta\textbf{Economic Controls}_{it} + \beta_3\%\Delta\textbf{Governance Controls}_{it} + \beta_4\textbf{Governance Controls}_{it} + \beta_4\textbf{Industry}_{it} + \beta_5\textbf{State}_{it} \quad \textbf{(6)}$$

The inclusion of the largest Industry and State indicator variables are introduced to investigate whether greater concentration of GBEs by industry and / or region impacts on the levels of and changes in CEO Compensation.

[131] Largest in terms of the number of observations included in the sample.

4 Main Results

Table 8 reports the results for Model (1) detailing the impact on CEO Total Compensation of the four performance measures being (i) ROA (Col 1), (ii) PM (Col 2), (iii) ATO (Col 3) and (iv) PM & ATO collectively (Col 4). The dependent variable in each case is the log of CEO Total Compensation (Ln CEO Total Comp). Random Effects (RE) regression with robust standard errors is applied to the panel data regressions due to the time invariant nature of the indicator variables relating to regulated price and CSOs.

Table 8 - Model 1 investigating the association between CEO Total Compensation and performance.

$$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1 \text{Performance}_{it} + \beta_2 \text{Economic Control}_{it} + \beta_3 \text{Governance Controls}_{it}$$

Dependent Variable ln CEO Total Comp	Predicted Sign	ROA *(Col 1)*	Profit Margin *(Col 2)*	Asset Turnover *(Col 3)*	Profit Margin + Asset T/O *(Col 4)*
$ROA\%_{it}$	+	-0.080			
		-(0.344)			
Profit Margin %	+		-0.077*		-0.077*
			-(1.865)		*-(1.848)*
$\text{Asset Turnover}_{it}$	+			0.023	0.018
				(0.479)	*(0.381)*
$\text{Ln Total Revenue}_{it}$	+	0.202***	0.209***	0.198***	0.207***
		(7.545)	*(8.257)*	*(7.414)*	*(8.273)*
$\text{Net Loss Dummy}_{it}$	-	0.020	-0.003	0.027	-0.002
		(0.567)	*-(0.104)*	*(1.005)*	*-(0.078)*
Board Size_{it}	+	-0.010	-0.010	-0.010	-0.010
		-(0.967)	*-(0.947)*	*-(0.951)*	*-(0.932)*
$\%\ \text{Indep Directors}_{it}$	+	-0.053	-0.030	-0.054	-0.028
		-(0.236)	*-(0.131)*	*-(0.236)*	*-(0.121)*
$\text{Gov Grants Dummy}_{it}$	+	0.052	0.052	0.054	0.053
		(1.184)	*(1.181)*	*(1.228)*	*(1.206)*
$\text{Ln \$Net Board Comp}_{it}$	+	0.193***	0.189***	0.197***	0.191***
		(3.559)	*(3.530)*	*(3.485)*	*(3.451)*
$\text{Regulated Price Dummy}_{it}$	-	0.073	0.068	0.078	0.069
		(0.834)	*(0.761)*	*(0.870)*	*(0.763)*
CSO_Dummy	-	-0.072	-0.064	-0.071	-0.060
		-(0.638)	*-(0.573)*	*-(0.616)*	*-(0.528)*
Constant		6.622***	6.525***	6.648***	6.531***
		(8.055)	*(7.948)*	*(8.216)*	*(8.067)*
R^2 *(Overall)*		0.600	0.601	0.603	0.603
Wald chi^2		200.63***	211.55***	199.6***	209.69***
Number of Observations		432	432	432	432
Random Effects		√	√	√	√

Note:

(i) *The 'z' score statistics are determined using robust standard errors and are reported in brackets.*

(ii) *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

The adjusted R-Squared of the regressions varies between 60% (Col 1) and 60.3% (Cols 3 & 4) and the Wald Chi^2 statistic ranges from 199.6 to 211.55 (Col 1 to Co 4) indicating that the model is statistically significant. Of the four separate performance measures used, only Profit Margin (PM) (Col 2 and Col 4) returns a significant result at the 10% level, and in both instances, contrary to expectations, it negatively impacts CEO compensation. Hence a 1% increase in PM will result in CEO compensation decreasing by 0.077% (Col 2 and 4). Firm size and board compensation are both positively associated with CEO compensation. Consequently, Model (1) does not provide evidence supporting a pay performance relation. In fact, the evidence suggests a negative association between performance measures and CEO compensation.

The results confirm findings of prior research in both the private sector (Murphy, 2013; Matolcsy and Wright, 2011, 2007) and the public sector (Cahan et al, 2005) that a major determinant of CEO Compensation is size and this is confirmed by the results for Model (1). The significance of total revenue (Ln Total Revenue) indicates that a 1% increase in Total Revenue results in a 0.202%, 0.209%, 0.198% and 0.207% increase in CEO compensation as disclosed in Columns (1) to (4). Significant positive results of similar magnitude are also obtained for board compensation (Ln $Net Board Comp) indicating that an increase of 1% in board compensation will most likely result in an increase in total CEO compensation ranging from 0.189% to 0.197%. None of the indicator variables are significant.

Table 9 reports the results for model (2) investigating the association between changes in CEO Total Compensation (%ΔCEO Total Comp) and changes in the GBEs

performance measures (ROA, PM and ATO). In all cases, the use of Random Effects[132] (RE) regressions with robust standard errors are applied to the panel data.

Table 9 - Model 2 investigating the association between changes in CEO Total Compensation and changes in GBEs performance.

$$\%\Delta CEO\ Comp_{it} = \alpha_t + \beta_1 \Delta Performance_{it} + \beta_2 \%\Delta Economic\ Controls_{it} + \beta_3 \%\Delta Governance\ Controls_{it} + \beta_4 Governance\ Controls_{it}$$

Dependent Variable %ΔCEO Total Comp	Predicted Sign	ΔROA (Col 1)	ΔProfit Margin (Col 2)	ΔAsset Turnover (Col 3)	ΔProfit Margin + ΔAsset Turnover (Col 4)
ΔROA_{it}	+	-0.121			
		(-0.937)			
ΔProfit Margin $_{it}$	+		-0.062		-0.067*
			(-1.616)		*(-1.702)*
ΔAsset $Turnover_{it}$	+			-0.114	-0.127*
				(-1.489)	*(-1.745)*
$\%\Delta Total\_Revenue_{it}$	+	0.109**	0.122**	0.117**	0.137**
		(2.000)	*(2.417)*	*(2.017)*	*(2.519)*
Net Loss $Dummy_{it}$	-	0.000	-0.011	0.006	-0.012
		(-0.003)	*(-0.371)*	*(0.232)*	*(-0.398)*
Board $Size_{it}$	+	0.000	0.001	-0.001	0.000
		(-0.003)	*(0.072)*	*(-0.074)*	*(-0.014)*
% Indep $Directors_{it}$	+	0.178*	0.178*	0.172*	0.173*
		(1.953)	*(1.950)*	*(1.899)*	*(1.917)*
$Gov\_Grants\_Dummy_{it}$	+	0.000	0.001	-0.001	0.001
		(-0.014)	*(0.027)*	*(-0.055)*	*(0.055)*
$\%\Delta\$Net\_Board\_Comp_{it}$	+	0.128*	0.124*	0.117	0.108*
		(1.726)	*(1.785)*	*(1.609)*	*(1.669)*
Regulated Price $Dummy_{it}$	-	-0.010	-0.008	-0.010	-0.010
		(-0.435)	*(-0.370)*	*(-0.443)*	*(-0.417)*
CSO $Dummy_{it}$	-	-0.009	-0.007	-0.010	-0.007
		(-0.334)	*(-0.275)*	*(-0.368)*	*(-0.253)*
Constant	+	-0.085	-0.091	-0.076	-0.082
		(-1.062)	*(-1.110)*	*(-0.939)*	*(-0.993)*
R^2 *(Overall)*		0.189	0.198	0.194	0.207
Wald chi^2		21.96***	17.02**	15.94*	18.01*
Number of Observations		332	332	332	332
Random Effects		√	√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets.

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

[132] The Hausman test was used to determine whether to apply Fixed or Random Effects the results of which specified *Random Effects* to be more suitable.

The overall R-Squared of the regressions varies between 18.9% and 20.7% and the Wald Chi^2 statistic confirms the model's statistical significance. Irrespective of model significance, only on two occasions does a performance measure return a significant result and, in both instances, the ΔPM and ΔATO (Col 4) return a significant negative result (at the 10% level). This may be interpreted as a 1% increase in efficiency (ΔPM) resulting in a -0.067% reduction in CEO Compensation (%ΔCEO Total Comp). Similarly, a 1% change in resource utilisation (ΔATO) results in a -0.127% reduction in CEO compensation (%ΔCEO Total Comp). This result is counterintuitive as it is rare for CEO Compensation to decrease irrespective of performance, however, it may impact negatively on the growth in CEO compensation.

The main significant drivers of CEO compensation is size (%ΔTotal Revenue) and change in net board compensation (%ΔNet Board Comp). The change in the size measure is significant at the 5% level and indicates that a 1% change in total revenue will increase CEO Compensation by between 0.109% (col 1), 0.122% (col 2), 0.117% (col 3) and 0.137% (col 4). The change in net board compensation is significant at the 10% level (%ΔNet Board Comp) in col 1, 2 and 4 only and indicates that a 1% increase in board compensation is expected to result in a 0.128% (col 1), 0.124% (col 2) and 0.108% (col 4) increase in CEO compensation. The percentage of independent directors (% Indep Directors) is also positive and significant at the 10% level. The positive and significant result may be counterintuitive as an increase in board independence would be expected to be more dilutive of CEO power. Alternately, an increase in the number of independent directors as an increase in board independence may lead to board fragmentation providing the CEO with greater influence, hence the ability to capture the board (Bebchuk & Fried, 2005). Nevertheless, the results indicate that a 1% increase in independent directors

results in an increase in CEO compensation between 0.172% and 0.178%. None of the indicator variables returned a significant result.

Table 10 reports the results of estimating Model (3) examining the pay-performance relation from an incentives perspective. That is, are current levels of CEO compensation designed to incentivise the CEO to achieve better future performance outcomes? In all cases, the use of Random Effects (RE) with robust standard errors are applied to the panel data regressions.

Table 10 - Model 3 - Test of whether the current level of CEO compensation provides an incentive for improving next year's performance.

$$\textbf{Performance}_{t+1} = \alpha_t + \beta_1 \textbf{Ln CEO Total Comp}_{it} + \beta_2 \textbf{Economic Control}_{it} + \beta_3 \textbf{Governance Controls}_{it}$$

Dependent Variable **(i) ROA_{it+1} *(Col 1)*** **(ii) Profit $Margin_{it+1}$ *(Col 2)*** **(iii) Asset $Turnover_{it+1}$ *(Col 3)***	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ *(Col 3)*
Ln CEO Total $Comp_{it}$	+	0.013	0.057*	0.055
		(0.777)	*(1.787)*	*(0.788)*
Ln Total $Revenue_{it}$	+	0.003	-0.014	0.113
		(0.592)	*(-0.965)*	*(1.140)*
Net Loss $Dummy_{it}$	-	-0.023**	-0.219***	0.018
		(-2.139)	*(-3.750)*	*(0.499)*
Board $Size_{it}$	+	0.004	0.004	-0.027*
		(1.508)	*(0.451)*	*(-1.807)*
% Indep $Directors_{it}$	+	0.044	0.333	-0.048
		(1.170)	*(1.537)*	*(-0.228)*
Gov_Grants_$Dummy_{it}$	+	-0.001	0.083**	-0.070
		(-0.127)	*(2.173)*	*(-1.644)*
Ln_$Net_Board_$Comp_{it}$	+	-0.008*	0.014	-0.065
		(-1.747)	*(0.617)*	*(-0.756)*
Regulated Price $Dummy_{it}$	-	-0.035***	-0.067	0.073
		(-3.499)	*(-1.503)*	*(0.591)*
CSO_$Dummy_{it}$	-	0.000	-0.023	-0.271*
		(-0.055)	*(-0.482)*	*(-1.783)*
Constant		-0.145	-0.834	-1.31
		(-0.858)	*(-1.448)*	*(-1.427)*
R^2 *(Overall)*		0.133	0.123	0.111
Wald chi^2		44.67***	58.02***	19.39**
Number of Observations		332	332	332
Random Effects		√	√	√

Note: *(i)* *The 'z' score statistics are determined using robust standard errors and are reported in brackets.*

(ii) *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

The R-Squared of the regressions ranges from 11.1% (Col 3) to 13.3% (Col 1). The Wald-Chi^2 statistics indicate that the models are statistically significant. Only on one occasion does CEO Total Compensation have a positive impact on performance. In Column (3), the Profit Margin is significant and suggests that a 1% increase in the current year's CEO Compensation results in a 0.057% increase in next year's Profit Margin. As expected, the Net Loss indicator variable negatively impacts on the profit based measures of ROA (-0.023% at the 5% level of significance) and PM (-0.219% at the 1% level of significance). Other significant results impacting on the performance measures include (i) a positive impact on PM from the ability to obtain Government Grants (0.083% at the 5% level of significance), (ii) the Regulated Price indicator variable, which expectedly returns a negative result on one occasion when using ROA as the performance measure, and (iii) both Board Size (-0.027% at the 10% level of significance) and the CSO Dummy (-0.271% at the 10% level), whose indicator variables negatively impact on the Asset Turnover.

A major concern with the estimation of Model (3) is the incidence of endogeneity or reverse causality. That is, the performance measures and CEO Total Compensation are either simultaneously determined or interdependent. In order to address this issue, an instrumental variable (IV) that is assumed to be exogenous and uncorrelated with the error generated in the original OLS[133] model is introduced into the first stage of a two stage least squares (2SLS) regression (Larcker and Rusticus, 2010). In the first stage (1SLS), CEO Total Compensation is used as the dependent variable and an IV is introduced as an additional regressor. The coefficients determined in the first stage (1SLS) are used to generate a predicted value for CEO Total Compensation and, with either the actual value

[133] Ordinary Least Squares results as reported in Table 10.

for CEO Total Compensation (Larcker and Rusticus, 2010) or the residual from the first stage (Vafaei et al., 2015), are used as regressors in the second stage to address the endogeneity issue. If the coefficient for CEO Total Compensation in the second stage is significant, then according to the Hausman test, the null of no endogeneity (Vafaei, et al., 2015, Larcker and Rusticus, 2010) can be rejected.

The instrumental variable *(IV Rec GICS)* that is utilised is calculated as follows:

$$\textit{IV Rec GICS} = 1 \div [\Sigma \text{GICS-GBE Cos} \div \Sigma(\text{GICS-GBE Cos} + \text{GICS-ASX Cos})]$$

The IV is based on the reciprocal[134] of the total number of GBEs in a specific GICS industry category industry divided by the combined total of GBEs and ASX companies in that specific GICS industry. It is assumed that the scarcity of managerial talent will impact on CEO compensation. The scarcity of managerial talent is determined by the size of the GBE industry (as measured by the number of GBEs) divided by the total number of companies (comprising the sum of GBE and ASX companies in the industry) in each specific GICS category. The significance of the GICS-IV variable is, consistent with expectations, that for larger industries, it is expected that pay is lower due to a greater availability of managerial talent. The IV based on the GICS codes relates purely to CEO compensation and is exogenous and uncorrelated with the error generated in the original OLS, as reported in Table 10. As the IV is only utilised in the 1st stage of a 2SLS, it only affects CEO Total Compensation after which the issue of endogeneity can be addressed in the 2nd stage of the 2SLS. The reciprocal of this measure is used so that the scarcity factor is measured and reported on the same basis as CEO Compensation, which is incorporated in the models based on size.

[134] In order to consider both the IV variable and CEO Compensation on the basis of size, the reciprocal of the scarcity value was utilised in the models.

The justification for the calculation and application of the GICS IV 'management scarcity' measure is based on the premise that this measure primarily impacts on CEO Compensation and is not related (or correlated) with any of the three performance measures (ROA, PM and ATO). Further, the IV is not related to any of the other explanatory variables being Total Revenue and Net Board Compensation.

As the GBEs are able to be classified using five GICS industry sectors, a unique IV measure is calculated for each GICS sector. Table 11 discloses the process used for the calculation of the IV variables for each GICS sector. The process comprises (i) classifying each GBE according to their GICS sector classification (Col 1); (ii) determining the market size by classifying all ASX[135] listed companies according to their GICS classification (Col 2); (iii) obtaining the total of GBE and ASX companies to determine the total size of each GICS sector (Col 3) and (iv) determining the scarcity factor by dividing GBE specific GICS by the sum of GBE and ASX entities in that GICS sector and then generating its reciprocal (Col 4 and Col 5) respectively. The IV variable is calculated once and utilised for the panel data in all years.

Table 11 - Data used for the calculation of the Instrumental Variable

$1 \div [\Sigma \text{GICS-GBE Cos} \div \Sigma(\text{GICS-GBE Cos} + \text{GICS-ASX Cos})]$

GICS Code	GICS Name	GBE Companies (1)	ASX Companies (2)	Total ASX + GBE (3)	Scarcity Factor (4) (1) ÷ (3)	Instrumental Variable *IV Rec GICS* (5) 1 ÷ (4)
15	Materials	7	701	708	**0.01**	**101.14**
20	Industrials	18	182	200	**0.09**	**11.11**
40	Financials	11	245	256	**0.04**	**23.27**
50	Telecommunications	1	24	25	**0.04**	**25.00**
55	Utilities	46	29	75	**0.61**	**1.63**
		83	1181	1264		

[135] ASX – Australian Stock Exchange.

The performance measures (ROA, PM and ATO) are excluded from the first stage (1SLS) as the objective is to generate a predicted value for CEO Total Compensation that is free from performance bias.

The results for the First Stage Least Squares (1SLS) are disclosed in Table 12. In all cases, the use of Random Effects (RE) regressions with robust standard errors are applied.

Table 12 - Model 3 - 1SLS regression with Ln CEO Total Comp being the Dependent variable and the introduction of the Instrumental Variable *(IV Rec_GICS)* as a regressor.

$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1 \text{Economic Control}_{it} + \beta_2 \text{Governance Controls}_{it} + \beta_3 \text{IV\_Rec\_GICS}_i$

Dependent Variable ln CEO Total Comp	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ *(Col 3)*
Ln Total $Revenue_{it}$	+	0.186***	0.185***	0.197***
		(8.660)	*(8.790)*	*(7.030)*
Net Loss $Dummy_{it}$	-	-0.049	-0.079**	0.032
		(-1.500)	*(-2.360)*	*(1.220)*
Board $Size_{it}$	+	-0.010	-0.011	-0.004
		(-0.720)	*(-0.800)*	*(-0.420)*
% Indep $Directors_{it}$	+	0.055	0.132	-0.836***
		(0.310)	*(0.810)*	*(-2.990)*
Gov Grants $Dummy_{it}$	+	-0.025	-0.029	0.123***
		(-0.630)	*(-0.780)*	*(3.560)*
Ln \$Net Board $Comp_{it}$	+	0.145***	0.139***	0.236***
		(4.780)	*(5.190)*	*(4.560)*
Regulated Price $Dummy_{it}$	-	0.008	0.021	0.132
		(0.110)	*(0.310)*	*(1.320)*
CSO_Dummy_{it}	-	-0.078	-0.081	-0.170
		(-0.870)	*(-0.890)*	*(-0.970)*
IV Rec GICS	+ / -	-0.002**	-0.002*	-0.003
		(-1.990)	*(-1.950)*	*(-0.840)*
Constant		7.529***	7.554***	6.852***
		(14.870)	*(15.430)*	*(9.290)*
R^2 *(Overall)*		0.614	0.604	0.614
Wald chi^2 *(G2SLS Stage 1)*		674.76***	802.16***	157.38***
Number of Observations		332	332	332
Random Effects		√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets.

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

The R^2 *(Overall)* of 0.614 and Wald Chi^2 ranging from 157.38 – 802.16 for all three Columns, signify the statistical significance of the three versions of the 1SLS for Model (3). The main drivers of CEO Total Compensation are Total Revenue (0.16%, 0.185% and 0.197% at the 1% level – Col 1 to 3 respectively) and Net Board Compensation (0.145%, 0.139% and 0.236% at the 1% level – Col 1 to 3 respectively), thereby confirming earlier findings (refer Tables 8 and 9). Additionally the Net Loss Dummy (-0.079% at 5% level – Col 2), as expected, negatively impacts on CEO compensation as does the % Independent Directors (-0.836% at the 1% level - Col 3). In addition, the ability to obtain Government Grants (0.123% at the 1% level – Col 3) has a significant positive impact on CEO Total Compensation.

According to Larcker and Rusticus (2010), the objective of introducing the IV is to address the issue of endogeneity between the dependent (performance) measure and the regressor being CEO Total Compensation. Accordingly, the negative significant result of -0.002% (Col 1 and Col 2) for the IV Rec_GICS variable demonstrates that the resultant predicted value of CEO Total Compensation is significantly affected by the IV and, accordingly, addresses the issue of endogeneity on two occasions when using the ROA and PM performance measure but not with ATO. The negative coefficient is used to adjust the predicted value of CEO compensation that will subsequently be used in the 2nd stage of the 2SLS. The determination of the impact of the IV is influenced by industry size[136] and as larger industries have greater access to managerial talent, the adjustment to CEO compensation to be used in the 2nd stage is smaller. This result is consistent with expectations and, consequently, adjusts the predicted value of CEO Total Compensation to cater for endogeneity when it is utilised in the second stage regression.

[136] Industry size as measured by the sum of GBEs and ASX companies classified according to GICS codes.

The results of the 2SLS[137] are disclosed in Table 13. In all cases, the use of Random Effects (RE) regressions with robust standard errors are applied to the panel data set.

Table 13 - Model 3 - 2SLS investigating the association between future performance based on the inclusion of the predicted value of CEO Total Comp (from 1SLS).

$Performance_{it} = \alpha_t + \beta_1$ Predicted ln CEO Total $Comp_{it} + \beta_2$ln CEO Total $Comp_{it}$ β_3Economic $Control_{it} + B_4$Governance $Controls_{it}$

Dependent Variable **(i) ROA_{it+1}** *(Col 1)* **(ii) Profit $Margin_{it+1}$** *(Col 2)* **(iii) Asset $Turnover_{it+1}$** *(Col 3)*	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ (*Col 3*)
Predicted Ln CEO Total $Comp_{it}$	+	0.025	0.721	-1.612
		(0.283)	*(1.566)*	*(-0.897)*
Ln Total $Revenue_{it}$	+	0.000	-0.128	0.449
		(0.025)	*(-1.437)*	*(1.260)*
Net Loss $Dummy_{it}$	-	-0.025**	-0.147*	0.075
		(-1.989)	*(-1.929)*	*(0.951)*
$Board\_Size_{it}$	+	0.003	0.009	-0.035
		(1.384)	*(0.629)*	*(-1.421)*
% Indep $Directors_{it}$	+	0.043	0.263	-1.444
		(1.163)	*(1.000)*	*(-0.886)*
Gov Grants $Dummy_{it}$	+	-0.001	0.101*	0.138
		(-0.122)	*(1.927)*	*(0.645)*
Ln $Net Board $Comp_{it}$	+	-0.009	-0.080	0.330
		(-0.755)	*(-1.271)*	*(0.724)*
Regulated Price $Dummy_{it}$	-	-0.034***	-0.131*	0.341
		(-3.123)	*(-1.655)*	*(1.103)*
CSO_Dummy_{it}	-	0.001	0.043	-0.478
		(0.051)	*(0.324)*	*(-1.339)*
Constant		-0.235	-5.957	9.786
		(-0.332)	*(-1.620)*	*(0.777)*
R^2 *(Overall)*		0.140	0.041	0.002
Wald chi^2 *(G2SLS Stage 2)*		51.09***	20.46**	7.45
Number of Observations		332	332	332
Random Effects		√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets.

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

[137] The results reported were determined using the XTIVREG command in Stata, which is the 2SLS command applicable for the analysis of endogeneity associated with panel data.

Utilising the three performance measures separately, ROA (Col 1), PM (Col 2) and ATO (Col 3) as the dependent variables and using the fitted value for CEO Total Compensation as an explanatory variable, the 2SLS results disclose R^2 (Overall) for the three performance measures, which are 14%, 4.1% and 0.02% respectively. Further, the Wald-Chi^2 results are significant for ROA (51.09) and PM (20.46), however, for the ATO (7.45) performance measure, the null hypothesis that all regressor variables are not different from zero cannot be rejected.

According to Larcker and Rusticus (2010) if the coefficient on the predicted regressor *(Ln CEO Total Comp)* is significant, the Hausman test rejects the null of no endogeneity. As the coefficient on the predicted CEO Total Compensation is not significant in any of the 2SLS models, there is no evidence of endogeneity between the performance measures and CEO compensation. Hence, in both the original and 2SLS analysis there is no evidence of a pay / performance relation thereby eliminating the incidence of endogeneity between the performance measures and CEO compensation.

Other significant results disclosed in the 2SLS are as expected and are also consistent with the results reported in the OLS (Table 10) for the Net Loss, Regulated Price and Government Grants indicator variables. Using the ROA and PM performance measures as the dependent variable, the Net Loss indicator variable returns a significant negative result consistent with the OLS results reported in Table 10. The Regulated Price indicator variable also, as expected, negatively impacted on the ROA and PM performance measures. The Government Grants dummy is only significant under the PM performance measure. Whereas the CSO indicator variable had a negative impact on the Asset Turnover performance measure in Table 10, there were no significant results returned for CSOs in the 2SLS. There were no statistically significant results for any of the regressors

when using ATO as the performance measure, which is consistent with the non-significance of the result for the Wald Chi^2 statistic.

Overall, the results of Model (3) using both OLS (Table 10) and 2SLS (Table 12 and 13) do not provide convincing evidence supporting the notion that future performance is enhanced by the incentives provided by current levels of CEO compensation. Further, endogeneity is not a major issue as there is very little evidence of reverse causality between future performance and current levels of CEO compensation in either direction. As such, the use of future financial performance measures as dependent variables driven by current levels of CEO compensation does not provide independently verifiable evidence in support of the pay performance relation.

Table 14 reports on Model (4) by examining the pay performance relation from an incentives perspective and examining whether changes in future performance being (ΔROA_{t+1}, ΔPM_{t+1} and ΔATO_{t+1},[138] can be attributed to current changes in: CEO Total compensation (%Δ CEO Compensation), the economic measure (%ΔTotal Revenue) and the governance measure of Board compensation (%Δ$Net_Board_Comp). In all cases, the use of Random Effects (RE) regressions with robust standard errors are applied to the panel data set.

[138] Calculated as ($\Delta ROA = ROA_{t+1} - ROA_{t0}$), ($\Delta PM = PM_{t+1} - PM_{t0}$) and ($\Delta ATO = ATO_{t+1} - ATO_{t0}$).

Table 14 - Model 4 investigating the association between changes in future performance (ΔROA, ΔPM and ΔATO based on current changes in CEO Total Compensation.

$$\Delta Performance_{t+1} = \alpha_t + \beta_1 \%\Delta CEO\ Total\ Comp_{it} + \beta_2 \%\Delta Economic\ Control_{it} + \beta_3 \%\Delta Governance\ Controls_{it} + \beta_4 Governance\ Controls_{it}$$

Dependent Variable **(i) ΔROA_{it+1} *(col 1)*** **(ii) ΔProfit Margin$_{it+1}$ *(col 2)*** **(iii) ΔAsset Turnover$_{it+1}$ (col 3)**	**Predicted Sign**	**ΔROA_{it+1}** ***(Col 1)***	**ΔProfit Margin$_{it+1}$** ***(Col 2)***	**ΔAsset Turnover$_{it+1}$** ***(Col 3)***
%ΔCEO Total Comp$_{it}$	+	-0.024	-0.046	-0.042
		(-1.150)	*(-0.650)*	*(-0.664)*
%ΔTotal_Revenue$_{it}$	+	-0.002	0.001	-0.005
		(-0.149)	*(0.013)*	*(-0.390)*
Net Loss Dummy$_{it}$	-	0.053***	0.280***	0.028*
		(3.123)	*(2.776)*	*(1.670)*
Board Size$_{it}$	+	-0.001	0.007	0.006
		(-0.423)	*(0.832)*	*(0.569)*
% Indep Directors$_{it}$	+	-0.001	-0.135	-0.083
		(-0.066)	*(-1.557)*	*(-0.567)*
Gov_Grants_Dummy$_{it}$	+	0.002	-0.01	0.000
		(0.336)	*(-0.377)*	*(0.021)*
%ΔNet_Board_Comp_{it}$	+	-0.007	-0.081	0.024
		(-0.517)	*(-0.969)*	*(0.844)*
Regulated Price Dummy$_{it}$	-	-0.001	-0.039	-0.014
		(-0.114)	*(-1.295)*	*(-0.551)*
CSO_Dummy$_{it}$	-	-0.015**	-0.048	-0.015
		(-2.154)	*(-1.514)*	*(-0.969)*
Constant		0.005	0.075	0.048
		(0.237)	*(0.784)*	*(0.566)*
R^2 *(Overall)*		0.083	0.063	0.021
Wald chi^2		17.37*	20.96**	18.41*
Number of Observations		232	232	232
Random Effects		√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets.

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

The R-Squared of the regressions are low, nevertheless, the Wald Chi^2 statistic (significant at the 5% and 10% level) supports the statistical significance of the Model (4). There is no statistically significant support for changes in any of the performance measures being driven by changes in CEO compensation (%ΔCEO Total Comp). The main significant results driving performance is the counter intuitive positive significant result for the Net Loss indicator variable. Additionally, the community service obligations (CSO Dummy) indicator variable, which expectedly reported a -0.015 result (at the 5% level), negatively impacted on the ΔROA performance measure. Perhaps the incidence of a net loss may indicate expectations regarding future performance improvements. Alternately, the incidence of a loss may be indicative of organisational complexity, which may require premiums to be included in the determination of CEO compensation.

Table 15 reports the results for Model (5) detailing the impact on CEO Total Compensation of the four performance measures, after including two additional variables, denoting the largest industry (GICS) sector being utilities and the state with the highest number of GBE observations being Victoria (VIC). The inclusion of these indicator variables adds an additional dimension to the impact of size on CEO compensation. The dependent variable in each case is the log of CEO Total Compensation (Ln CEO Total Comp). Random effects regression with robust standard errors is applied to the panel data regressions.

Table 15 - Model 5 reports on CEO compensation investigating the pay performance relation with the inclusion of indicator variables representing the largest (by number of observations) (i) Industry (GICS) Sector, and (ii) State.

$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1\text{Performance}_{it} + \beta_2\text{Economic Controls}_{it} + \beta_3\text{Governance Controls}_{it} + \beta_4\text{Utilities (GICS Sector) Dummy}_{it} + \beta_5\text{VIC (State) Dummy}_{it}$

Dependent Variable ln CEO Total Comp_{it}	Predicted Sign	ROA_{it} *(Col 1)*	Profit Margin_{it} *(Col 2)*	Asset Turnover_{it} *(Col 3)*	Profit Margin_{it} + Asset Turnover_{it} *(Col 4)*
$\text{ROA\%}_{it}$	+	-0.106			
		(-0.452)			
Profit Margin %	+		-0.078*		-0.077*
			(-1.860)		*(-1.837)*
Asset Turnover	+			0.030	0.026
				(0.646)	*(0.546)*
Ln Total Revenue_{it}	+	0.204***	0.211***	0.198***	0.208***
		(7.823)	*(8.436)*	*(7.202)*	*(7.970)*
Net Loss Dummy_{it}	-	0.016	-0.004	0.027	-0.003
		(0.448)	*(-0.135)*	*(0.958)*	*(-0.097)*
Board Size_{it}	+	-0.010	-0.010	-0.010	-0.010
		(-0.932)	*(-0.924)*	*(-0.907)*	*(-0.894)*
% Indep Directors_{it}	+	-0.063	-0.045	-0.070	-0.044
		(-0.276)	*(-0.193)*	*(-0.300)*	*(-0.189)*
$\text{Gov\_Grants\_Dummy}_{it}$	+	0.051	0.053	0.054	0.054
		(1.141)	*(1.168)*	*(1.207)*	*(1.187)*
$\text{Ln\_\$Net\_Board\_Comp}_{it}$	+	0.190***	0.187***	0.196***	0.191***
		(3.552)	*(3.514)*	*(3.461)*	*(3.426)*
Regulated Price Dummy_{it}	-	0.159	0.150	0.156	0.145
		(1.444)	*(1.367)*	*(1.387)*	*(1.294)*
$\text{Utilities(GICS Sector)}_{it}$	+	-0.188	-0.184	-0.172	-0.171
		(-1.264)	*(-1.257)*	*(-1.173)*	*(-1.183)*
VIC_{it}	+	-0.196**	-0.194**	-0.200**	-0.200**
		(-2.009)	*(-2.037)*	*(-2.002)*	*(-2.024)*
CSO_Dummy_{it}	-	0.130	0.136	0.131	0.142
		(0.755)	*(0.816)*	*(0.764)*	*(0.842)*
Constant		6.704***	6.589***	6.710***	6.593***
		(8.775)	*(8.562)*	*(8.807)*	*(8.626)*
R^2 *(Overall)*		0.638	0.637	0.640	0.640
Wald chi^2		264.83***	275.45***	258.40***	268.03***
Number of Observations		432	432	432	432
Random Effects		√	√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

The adjusted R-Squared of the regressions varies between 63.7% (Cols 1 & 2) and 64% (Cols 3 & 4) and, coupled with the significant results for the Wald Chi^2 (Cols 1 – 4),

indicates that each of the models are statistically significant. Of the four separate performance measures used, only Profit Margin (PM) (Col 2 and Col 4) returns a significant result at the 10% level and in both instances, contrary to expectations, it negatively impacts on CEO compensation (consistent with the results for Model 1 – Table 8 Col 2 & 4). The model implies that a 1% increase in the PM measure results in CEO compensation decreasing by 0.075%.

The Utilities (GICS) indicator is not significant. As such, there does not appear to be any industry effect impacting on CEO Total Compensation. However, the State indicator variable returns are statistically significant and negative (at the 5% level) for each of the four performance measures used. The negative impact on CEO total compensation ranges between -0.196% to -0.200%, thereby indicating that CEOs of Victorian GBEs receive lower total compensation relative to CEOs in other states.

The significance (at the 1% level) of Total Revenue and Net Board Compensation confirm findings in the test results reported earlier in this chapter (Model 1), that the main determinants for CEO Compensation are GBE size followed by the amounts paid to non-executive directors. The results demonstrate that holding all other independent variables constant; (i) a 1% increase in Total Revenue results in a 0.204%, 0.211%, 0.198% and 0.208% increase in CEO compensation as disclosed in Columns (1) to (4) respectively, and (ii) an increase of 1% in Net Board Compensation results in an increase in total CEO compensation ranging from 0.187% to 0.196%.

Table 16 reports on Model (6) investigating whether the largest GICS sector, Utilities (Utilities GICS Sector)and the largest state, Victoria (VIC) included as indicator variables influence the change in CEOs' Total Compensation (%ΔCEO Total Comp). In all cases,

the use of Random Effects[139] (RE) regressions with robust standard errors are applied to the panel data.

Table 16 - Model 6 reports on the Change in CEO compensation with the inclusion of the largest (by number of observations) Industry and State indicator variables.

$$\%\Delta CEO\ Comp_{it} = \alpha_t + \beta_1 \Delta Performance_{it} + \beta_2 \%\Delta Economic\ Controls_{it} + \beta_3 Governance\ Controls_{it} + \beta_4 \%\Delta Governance\ Controls_{it} + \beta_5 Utilities\ (GICS\ Sector)\ Dummy_{it} + \beta_6 VIC\ (State)\ Dummy_{it}$$

Dependent Variable %ΔCEO Total Comp	Predicted Sign	ΔROA$_{it}$ *(Col 1)*	ΔProfit Margin$_{it}$ *(Col 2)*	ΔAsset Turnover$_{it}$ *(Col 3)*	ΔProfit Margin$_{it}$ + ΔAsset T/O$_{it}$ *(Col 4)*
ΔROA$_{it}$	+	-0.111			
		(-0.863)			
ΔProfit Margin$_{it}$	+		-0.061		-0.066*
			(-1.576)		*(-1.656)*
ΔAsset Turnover$_{it}$	+			-0.104	-0.119
				(-1.390)	*(-1.636)*
%ΔTotal_Revenue$_{it}$	+	0.111**	0.124**	0.118**	0.138***
		(2.071)	*(2.489)*	*(2.074)*	*(2.571)*
Net Loss Dummy$_{it}$	-	0.008	-0.003	0.013	-0.005
		(0.257)	*(-0.088)*	*(0.439)*	*(-0.144)*
Board Size$_{it}$	+	0.002	0.002	0.001	0.002
		(0.297)	*(0.358)*	*(0.210)*	*(0.246)*
% Indep Directors$_{it}$	+	0.185**	0.184**	0.179**	0.179**
		(2.042)	*(2.031)*	*(1.978)*	*(1.986)*
Gov_Grants_Dummy$_{it}$	+	-0.001	0.000	-0.002	0.001
		(-0.070)	*(-0.011)*	*(-0.078)*	*(0.062)*
%ΔNet_Board_Comp$_{it}$	+	0.123*	0.118*	0.113	0.104*
		(1.694)	*(1.751)*	*(1.593)*	*(1.657)*
Regulated Price Dummy$_{it}$	-	-0.004	-0.001	-0.002	0.001
		(-0.104)	*(-0.018)*	*(-0.059)*	*(0.020)*
Utilities (GICS Sector)$_{it}$	+	-0.008	-0.011	-0.011	-0.015
		(-0.195)	*(-0.248)*	*(-0.261)*	*(-0.342)*
VIC$_{it}$	+	-0.057**	-0.056**	-0.054*	-0.053*
		(-1.980)	*(-1.964)*	*(-1.912)*	*(-1.851)*
CSO Dummy$_{it}$	-	0.030	0.032	0.029	0.031
		(0.937)	*(0.980)*	*(0.888)*	*(0.952)*
Constant	+	-0.098	-0.103	-0.089	-0.093
		(-1.152)	*(-1.187)*	*(-1.029)*	*(-1.066)*
R^2 *(Overall)*		0.198	0.208	0.202	0.215
Wald chi^2		21.46*	20.85*	18.06*	21.97*
Number of Observations		332	332	332	332
Random Effects		√	√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

[139] The Hausman test was used to determine whether to apply Fixed or Random Effects the results of which specified *Random Effects* to be more suitable.

The overall R-Squared of the regressions varies between 19.8% (Col 1) and 21.5% (Col 4) and, coupled with the results for the Wald Chi^2 statistic, supports the statistical significance of these models. The inclusion of the Utilities (GICS Sector) indicator variable does not impact on changes in CEO total compensation, however, the VIC (State) regressor returns a negative significant result, thereby signifying that CEOs of GBEs in Victoria have on average a lower growth rate for CEO compensation .

Only in one instance being the ΔPM (Col 4) is a performance measure significant and, contrary to expectations, it was negative (-0.066, at the 10% level). This may be interpreted as an increase in efficiency (ΔPM) is expected to result in a reduction in CEO Compensation. However, as the evidence discloses continuous pay increases for CEOs, this decrease is more than adequately compensated for by changes in both the size measure and board compensation. Consequently, the main significant drivers of a positive change in CEO compensation are (i) changes in the size measure namely Revenue Growth (%ΔTotal Revenue) ranging from 0.111% to 0.138%, (at the 1% and 5% level of significance), (ii) the presence of independent directors (% Indep Directors) returning a positive impact on CEO compensation (at the 5% level), and (iii) the change in net board compensation (%ΔNet Board Comp) being 0.123, 0.118 and 0.105 (at the 10% level) in Cols 1, 2 and 4 only. Consistent with prior test results, there is no significant evidence of a pay performance relation based on the changes in CEO compensation being supported by changes in any of the financial performance measures used. Overall, the test indicates that, irrespective of the industry or state, there is no statistical evidence supporting changes in financial performance measures impacting on changes in CEO compensation.

5 Sensitivity Analysis

5.1 Alternative Economic, Compensation Measures and Performance Measures

The following sensitivity tests are undertaken to replicate Models (1) to (6) based on:

1. Substituting Total Assets and Changes in Total Assets as the economic size measure to investigate whether an alternative economic size measure impacts on the pay performance relation, and
2. Substituting CEO Bonus Compensation for CEO Total Compensation to determine whether the reported bonus is linked to performance.

3. Substituting one year lagged performance measures to test whether the current year's level and changes in CEO compensation are a reward for past performance.

5.1.1 Alternative Size Measure using Total Assets

Models (1) to (6) as per the main tests are replicated using the same compensation, performance, governance and institutional controls but employing a different economic size measure. Total Assets (Ln Total Assets) and changes in Total Assets (%ΔTotal Assets) will replace Total Revenue (Ln Total Revenue) and changes in Total Revenue (%ΔTotal Revenue*)* as the measure of size.

The results reported for Model (1) are detailed in Appendix A, Table A1. The adjusted R-squared of the regressions varies between 47.1% and 54.9% and, coupled with the Wald Chi^2 statistics, indicates overall that the models are statistically significant. The only significant performance measure is Asset Turnover, 0.235 (Col 3) and 0.236 - (Col 4) (significant at 1% level*)* indicating that management policies resulting in the effective utilisation of resources enhance CEO compensation. This is a departure from the main test results reported in Table 8 where only profit margin was negative and significant. As per the main tests, the major determinants of CEO Compensation are size as measured by

Total Assets (Ln Total Assets) and Net Board Compensation (Ln $ Net Board Comp). The CSO indicator variable had a significant negative impact (at the 5% level) on CEO compensation on two occasions (from four regressions).

The results for Model (2) are detailed in Appendix A, Table A2. There is no evidence linking changes in CEO compensation with performance. The overall significance of Model (2) using change in total assets (instead of change in total revenue) is quite low with the R^2 ranging between 13.1% and 13.4%. However, the Wald Chi^2 negates the statistical validity of this test, supporting the null hypothesis that the coefficients used as regressors in the model are not significantly different from zero. Consistent with the main tests as reported in Table 9, the %Indepenent Directors has a significant positive impact on the change in CEO compensation (%ΔCEO Total Comp).

The results for Model (3) are detailed in Appendix A, Table A3. The R^2 (overall) ranges from 0.124 to 0.271 and the Wald Chi^2 result ranges between 36.79 and 56.50 (Col 1 - 3), which supports the statistical significance of the model. On one occasion, CEO compensation returns a positive significant impact on the ATO performance measure (at the 1% level). In the main test results, only profit margin (PM) returned a significant result (at the 10% level). Apart from Total Assets (Ln Total Assets) negatively impacting on the ROA performance measure (-0.006 (Col 1) significant at the 5% level), all other results are as per the main tests as reported for Table 10.

For Model (3), a 2SLS analysis was also undertaken to test for endogeneity or reverse causality using total assets as the economic size measure. The main difference in the 1SLS (Table A4) result is that the instrumental variable, IV Rec_GICS does not return a significant result and that the CSO indicator variable has a significant negative impact on CEO compensation (at the 1% level) on two out of three regressions. Apart from these

two variations, the results are almost identical to the 1SLS as per the main test results (Table 12). For the 2SLS (Table A5), there is no evidence of endogeneity in the models as none of the regressors return a statistically significant result. Consequently, as the compensation regressor did not return a significant result on any occasion, there is no support for the presence of endogeneity nor the pay-performance relation based on future performance being driven by current levels of CEO pay.

The results for Model (4) are detailed in Appendix A, Table A6. Although the R^2 (overall) is low ranging from 2.1% - 9.6%, the Wald Chi^2 return a significant result on two from three occasions (excluding ΔATO performance measure). Consistent with the main test results, there is no evidence of changes in CEO pay explaining changes in performance. Further, the positive significant coefficient for the Net Loss Indicator variable signifying that a loss impacts positively on a profit performance measure is counterintuitive, alternately, it may be a lead indicator for expectations of future performance improvements.

The results for Model (5) are detailed in Appendix A, Table A7. Using Total assets (Ln Total Assets) as the economic size measure provides results showing a negative significant PM ratio (-0.078 and -0.077 at the 10% level, Table 15, Col 2 & 4) in the main test being replaced by the positive significant coefficient for the ATO performance measure (0.249 and 0.250 at the 1% level, Col 3 and Col 4). This indicates that increases in asset utilisation positively impact on CEO compensation, which may be justifiable due to the capital intensity of most GBEs. The only other significant variation from the main test results is the significance of the Regulated Price indicator variable, which has a positive impact on the ROA and Profit Margin performance measures (at the 5% level - Col 1 and Col 2). Total assets (Ln Total Assets), board compensation (Ln $Net Board

Comp) and the Vic indicator variable confirmed the significance and direction of these measures as reported in the main tests.

The results for Model (6) are detailed in Appendix A, Table A8. The tests report a low R^2 ranging from 0.137 – 0.142 and a Wald Chi^2 result ranging from 14.96 to 16.18 indicating that the null hypothesis, that all coefficients used in the model are not significantly different from zero, cannot be rejected. As such, this model does not provide any additional evidence supporting a pay performance relation being affected by the largest industry (Utilities GICS Sector) and largest jurisdiction (VIC).

5.1.2 GBEs and CEO Bonus payments

Models (1) to (6) as per the main tests are replicated using the same economic size, performance, governance and institutional controls but employing a different compensation measure. CEO total compensation (Ln CEO Total Comp) and changes in CEO total compensation (%ΔCEO Total Comp) are replaced by CEO Bonus payments (Ln Ceo Bonus) and changes in CEO bonus (%ΔCEO Bonus). There was a total of 94 CEO bonus observations out of the original 432 observations indicating that only 21.7% of GBEs pay bonuses. It may be the case that many GBEs do not provide full details in their remuneration disclosures relating to CEOs resulting in an inability to determine whether a bonus has been paid and, subsequently, the amount of the bonus.

The results reported for Model (1) are detailed in Appendix B, Table B1. The adjusted R-squared of the regressions varies between 76.3% and 77.9% and, coupled with the Wald Chi^2 statistics, confirms the statistical validity of the models. None of the performance measures return a statistically significant result in support of a relationship between CEO performance and the payment of bonuses. The Regulated Price indicator variable returns a significant positive coefficient (at the 1% level) ranging from 0.615 to 0.693, (Col 1 –

Col 4) signifying that the GBEs in regulated pricing industries are more likely to pay bonuses. Additionally the CSO indicator variable returns a significant positive coefficient (at the 1% level) ranging from 0.1.857 to 1.903, (Col 1 – Col 4) signifying that GBEs with CSOs are more likely to pay bonuses. Overall, CEO bonus payments, similar to CEO total compensation as per the main tests, are primarily driven by the size and net board compensation explanatory variables.

The results for Model (2) are detailed in Appendix B, Table B2. There is no evidence linking changes in CEO Bonus compensation to changes in any of the financial performance measures. This is a departure from the main test results where the PM and ATO performance measures were negative and significant (at the 10% level). The overall significance of Model (2) when using the change in CEO bonus payments instead of the change in CEO total compensation is quite low with an R^2 ranging between 6.03% - 6.04% and with the Wald Chi^2 ranging between 3.85 and 3.92 (Col 1 to 4) indicating that the null hypothesis, that all coefficients used in the model are not significantly different from zero, cannot be rejected. The only statistically significant regressor is Board Size (at the 10% level) with a negative coefficient, implying that GBEs with larger pay their CEOs a lower bonus. Additionally, CEO Bonus compensation, unlike the main tests are not affected or influenced by changes in (i) total revenue, (ii) % of independent directors and (iii) board compensation.

The results for Model (3) are detailed in Appendix B, Table B3. CEO Bonus does not return a significant result affecting any of the performance measures. This is a departure from the main test results where CEO compensation affected the profit margin (PM). Apart from Total Revenue being negatively significant (at the 5% level) on a single

occasion where PM is used as the dependent variable, all other results are as per the main tests as reported in Table 10.

For Model (3), a 2SLS analysis was undertaken to test for endogeneity or reverse causality using CEO Bonus in place of CEO total compensation.

The main differences in the 1SLS (Table B4) results are (i) the instrumental variable, IV_Rec_GICS, is not significant on any occasion, (ii) the Net Loss indicator variable is positive on a single occasion, (iii) the Regulated Price indicator variable is positive, and (iv) the CSO indicator variable is positively associated with CEO Bonus payments. The inference here is that GBEs make bonus payments to CEOs even when losses occur. . For the 2SLS (Table B5), there was no evidence of endogeneity in the models as apart from the CSO indicator variable returning a positive significant result on one occasions none of the other regressors are significant. Consequently, as the compensation measure is not significant on any occasion, there is no support for the assertion that future performance is based on or driven by bonuses paid to CEOs in the current period.

The results for Model (4) are detailed in Appendix B, Table B6. Consistent with the main test results, there is no evidence of changes in bonus payments to CEOs explaining changes in performance. The overall significance of Model (4) when using the change in performance measures as the dependent variable generates an R^2 ranging between 15.8% - 37.3%. The Wald Chi^2 only on one occasion is significant at the 5% level (for the ΔPM dependent variable) indicating that the null hypothesis, which hypothesises that all coefficients used in the model are not significantly different from zero, cannot be rejected for two out of the three regressions. However, as there were only 45 observations (compared to 232 in the main tests), the small sample may not be indicative of reality and, consequently, the interpretation of the results may be misleading. Despite this limitation,

departures from the main test results occurred for (i) a negative significant coefficient for the change in total revenues when ΔATO is the dependent variable and (ii) the negative significant impact of both, Board Size and %Independent Directors when the dependent variables are the expected changes in ROA and PM performance measures. As per the main test, the positive coefficient for the Net Loss indicator variable is counterintuitive as losses would be expected to negatively impact on financial performance measures. Alternately, improved performance by way of reduced losses over time may also return a positive coefficient for the Net Loss indicator variable.

The results for Model (5) are detailed in Appendix B, Table B7. On no occasion is a performance measure significant. As such, the model does not provide any evidence supporting the payment of bonuses based on financial performance measures. The statistically significant variations from the main test results affecting CEO Bonus payments include (i) the counterintuitive positive coefficients for the Net Loss indicator variable, (ii) the positive influence of the Government Grants indicator variable, (iii) the positive impact of the Regulated Price Indicator variable, (iv) the negative impact of the Utilities (GICS) indicator variable, (v) Victorian GBEs do not pay bonuses to their CEOs, and (vi) the significant positive coefficients for the CSO indicator variable. Hence, it can be concluded that (i) losses (ii) government grants do not inhibit the ability of GBEs to pay a bonus to their CEOs. In addition, CEOs of GBEs in regulated pricing industries and those GBEs with CSOs are likely to receive higher bonus payments. The absence of a result for the Victoria (Vic) state indicator variable may be due to government policy in that state not enabling bonus payments to CEOs of GBEs. However, consistent with the main test results (Table 15), the economic size measure comprising total revenue and board compensation confirm the statistical significance and positive direction of these measures on CEO bonus compensation.

The results for Model (6) are detailed in Appendix B, Table B8. The overall significance of Model (6) when using the change in CEO Bonus as the dependent variable generates an R^2 ranging between 6.4% - 6.5%. The Wald Chi^2 is not significant in any of the four regressions, indicating that the null hypothesis, which hypothesises that all coefficients used in the model are not significantly different from zero, cannot be rejected. Once again, none of the four performance measures are statistically significant. The only significant results encountered in this model that differ from the main tests relate to (i) the Net Loss indicator variable, which on a single occasion negatively impacts on bonus payments (Col 3), (ii) board size returning a result that negatively impacts on changes to the bonus payments (significant at the 5% level, Col 1 to Col 4), and (iii) the CSO indicator variable having a significant positive impact on changes in bonus payments to CEOs (significant at the 1% level, Col 1 to Col 4). A net loss, as expected, is intended to either eliminate or reduce any change in the payment of a bonus while an increase in Board size also has the effect of reducing the change in bonus payment. The significant positive coefficient of the CSO indicator variable demonstrates that bonus payments are also made to CEOs of GBEs with CSOs. Unlike the main tests, %ΔTotal Revenue and %ΔNet Board Compensation did not return any significant results, thereby indicating that changes to CEO bonus payments are not a function of changes in size or changes in board compensation.

To test whether any of the regressors had a significant influence over the payment of a bonus, a logistic[140] regression was conducted with the Bonus being the indicator dependent variable. The results are tabulated in Appendix B, Table B9 and show that none of the performance measures support the payment of a bonus. Further, the Wald

[140] Panel data regressions using the XTLOGIT function in Stata with robust standard errors.

Chi^2 statistics are not statistically significant in any of the four regressions, indicating that the null hypothesis, which hypothesises that all coefficients used in the model are not significantly different from zero, cannot be rejected.

5.1.3 Alternative Performance Measures (Using Lagged Performance Measures)

Models (1), (2), (5) and (6)[141] as per the main tests are replicated using one year lagged performance measures being ROA_{t-1}, PM_{t-1} and ATO_{t-1} and changes in performance measures[142] ΔROA_{t-1}, ΔPM_{t-1} and ΔATO_{t-1}. The lagged performance measures replace the current and future performance measures utilised in the main tests. The objective of these tests is to examine the pay-performance relation from a 'rewards' perspective. That is, are CEO's of GBEs rewarded for past performance? The compensation, economic size, governance and institutional controls are as per the main tests.

The results reported for Model (1) are detailed in Appendix C, Table C1. The adjusted R-squared of the regressions varies between 61.7% and 62.4% and, coupled with the Wald Chi^2 results, indicates that the models are statistically significant. The only significant performance measure is Asset Turnover with a coefficient of 0.078% (at 10% level) in both Col 3 and Col 4, indicating that management is rewarded for the effective utilisation of resources. This is a departure from the main test results where the profit margin PM coefficient negatively impacts on CEO compensation (Table 8). In addition, the Net Loss indicator variable returns a positive significant result in all cases signifying that CEO compensation is not adversely affected by losses incurred or alternately are rewarded for reducing prior year losses. Consistent with the main test results (Table 8), the main

[141] Models (3) and (4) are not included as current year CEO compensation will not affect last year's performance measures.

[142] The changes in the performance measures are based on [(t-1) – (t-2)]. That is, for the 2013 year, the change performance measure utilises the change performance measure calculated by subtracting 2011 performance from 2012 performance.

determinants of CEO Compensation are size as measured by Total Revenue (Ln Total Revenue) and Net Board Compensation (Ln $ Net Board Comp).

The results for Model (2) are detailed in Appendix C, Table C2. There is no evidence linking changes in CEO compensation with changes in performance. The overall significance of Model (2) is quite low with an R^2 ranging between 2.6% to 5.3% and the Wald Chi^2 ranging from 19.8 to 20.39 (significant at the 10% level). The main differences between using current and lagged change performance measures is that changes in total revenue (%ΔTotal Revenue) and net board compensation (%Δ$Net Board Compensation) do not impact on CEO compensation when using lagged performance measures, which is a departure from the results reported in the main tests (Table 9). However, consistent with the main test results, the only significant result impacting positively on the change in CEO compensation (%ΔCEO Compensation) is the number of independent directors (%Indepenent Directors).

Models (3) and (4) are not considered as current levels of compensation cannot influence past performance. As such, the use of prior year performance measures and changes in prior year performance measures as dependent variables, being driven by current levels and current changes in CEO compensation, is not economically feasible.

The results for Model (5) are detailed in Appendix C, Table C3. Introducing the Industry (Utilities - GICS Sector) and State (VIC) indicator variables with the lagged performance measures results in a negative significant PM ratio (-0.078 and -0.077 at the 10% level for Col 2 and Col 4) in the main test being replaced by the positive significant coefficient for the ATO performance measure (0.080 at the 5% level for Col 3 & Col 4). This indicates that increases in asset utilisation positively impact on CEO compensation, which may be justifiable due to the capital intensity of most GBEs. The only other significant

variation from the main test results is the positive significance (at the 5% level) of the Net Loss indicator variable, further supporting the notion that CEO compensation is not affected by profit based performance measures. The Victoria (VIC) indicator variable, while significant in the main tests, does not return a significant result in this sensitivity test. However, total revenues and board compensation confirm the significance and direction of these measures as reported in the main tests.

The results for Model (6) are detailed in Appendix C, Table C4. The analysis of changes in lagged performance ratios report a low R^2 ranging from 0.039 – 0.067 and a Wald Chi^2 ranging from 23.22 to 26.75 and are consistent with than the main test results (Table 16). On no occasion do changes in lagged performance measures return a significant result that impacts on changes in CEO compensation. The only significant variables in this test were the %Independent Directors and the state (VIC) indicator variable. The results confirming the findings of the main tests that independent directors impact positively on changes to CEO compensation. However, being a CEO in a Victorian (VIC) GBE results in negative (or lower) changes to CEO total compensation. Whereas the main tests also disclose that changes in (i) revenue and (ii) board compensation impact positively on CEO compensation, this sensitivity test does not support this.

6 Conclusion

This chapter provides evidence on the association between CEO compensation, changes in CEO compensation and GBE performance where performance is measured using financial measures obtained from the audited financial statements contained in the Annual Reports of GBEs. The use of financial measures as an exogenous performance measure is justified on the basis of the legislative pronouncements and regulatory requirements specifying that the annual report of GBEs must include an "Annual Performance

Statement" (Australian Government, RMG 126, paragraph 3.13(a) page 14) that includes commentary on actual results matched with publicly disclosed performance expectations. The evidence provided in this chapter is that the financial measures of performance do not justify the current level of CEOs' compensation nor the growth in CEOs' compensation between 2006 and 2013.

To confirm the main findings, a number of sensitivity tests are undertaken. The first of these tests utilise total assets and changes in total assets as alternative size measures. The results confirm the main test findings that there is no significant, observable relation between the financial performance metrics and levels of and changes in CEO compensation. Additional tests performed considered (i) whether the payment of Bonuses were linked to performance, and (ii) whether the prior year's performance is rewarded by the current year's level or change in CEOs compensation. Using these alternative model specifications, the evidence does not support the existence of a statistically significant relation between current or past GBE performance and levels of and growth in CEOs' compensation.

Overall, the evidence presented in this chapter demonstrates that CEO compensation and growth in CEO compensation are not directly a function of independently verifiable financial performance metrics. Although there were instances where performance measures had a significant positive impact on CEO compensation, the evidence linking pay with financial performance measures is sparse and there was no consistency in the results. Alternately, CEO performance measures may be based on internal (endogenous) GBE benchmarks independent of the financial performance measures. In fact, it is a regulatory requirement that comments on performance be matched with both financial and non-financial expectations. Whilst most GBEs have both financial and non-financial

performance indicators, these targets are rarely disclosed and the annual reports do not provide information comparing targets with actual performance.

One possible explanation for the findings of this chapter is the lack of appropriate corporate governance mechanisms for GBEs. With respect to governance, there exists a multi-level[143] agency relationship, however, the principal, being the Australian Public, is absent. The power sits with the shareholder minister(s) who can override both the board of directors and CEO with respect to appointment, termination and compensation. This situation has the effect of diffusing responsibility and accountability, adversely impacting on governance. Hence, political connections and influence may affect the monitoring relationship between government minister(s), the board and CEO. Further, the evidence reported indicates a strong association between the levels of and growth in board compensation with CEO compensation, which suggests that the CEO may have been able to capture the board. Perhaps the public disclosure of quantifiable and externally observable of performance targets and their achievement as the basis for both CEO and board compensation could enhance the credibility of the governance structures employed by GBEs.

Future research in the area of corporate governance in the public sector could focus on (i) the expertise and qualifications of independent directors and the impact of political influence or connections on board appointment and (ii) investigating the quality of financial reporting and the disclosures contained therein for public sector entities. There is no reason why GBEs that have been incorporated should not comply with the disclosure requirements specified in the Corporations Act (2001), which make specific reference to compliance with Accounting Standards. In terms of governance structures, giving greater

[143] Multi-level agency structure being – Shareholder Minister(s) – Board of Directors – CEO.

responsibility and accountability to the board while reducing the overriding power of the shareholder minister(s), coupled with greater disclosure, may result in better outcomes with respect to the pay / performance relation for both the CEO and the board of directors. Further, the fact that the original sample had to exclude many GBEs based on the absence of disclosures, the lack of qualifications in the audit report with respect to compliance with legislation and accounting standards may also provide a foundation for future research in the audit of public sector entities.

Appendix A – Sensitivity Results using Total Assets as alternate Size Measure

Table A1 - Model 1 substituting Total Assets as the alternate Economic Measure

$$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1\text{Performance}_{it} + \beta_2\text{Economic Control}_{it} + \beta_3\text{Governance Controls}_{it}$$

Dependent Variable ln CEO Total Comp	Predicted Sign	ROA *(Col 1)*	Profit Margin *(Col 2)*	Asset Turnover *(Col 3)*	Profit Margin + Asset Turnover *(Col 4)*
$ROA\%_{it}$	+	0.230			
		(1.029)			
Profit Margin %	+		-0.016		-0.025
			(-0.867)		*(-1.209)*
Asset Turnover	+			0.235***	0.236***
				(3.537)	*(3.530)*
$\text{Ln Total Assets}_{it}$	+	0.140***	0.142***	0.167***	0.169***
		(5.060)	*(5.294)*	*(6.530)*	*(6.521)*
$\text{Net Loss Dummy}_{it}$	-	0.002	-0.025	-0.006	-0.016
		(0.058)	*(-0.823)*	*(-0.214)*	*(-0.521)*
Board Size_{it}	+	-0.012	-0.012	-0.008	-0.008
		(-1.016)	*(-0.993)*	*(-0.760)*	*(-0.750)*
$\%\text{ Indep Directors}_{it}$	+	-0.094	-0.077	-0.026	-0.017
		(-0.389)	*(-0.312)*	*(-0.108)*	*(-0.071)*
$\text{Gov\_Grants\_Dummy}_{it}$	+	0.052	0.049	0.053	0.053
		(1.077)	*(1.019)*	*(1.128)*	*(1.119)*
$\text{Ln\_\$Net\_Board\_Comp}_{it}$	+	0.242**	0.241**	0.225***	0.225***
		(3.238)	*(3.220)*	*(3.323)*	*(3.310)*
$\text{Regulated Price Dummy}_{it}$	-	0.131	0.122	0.075	0.073
		(1.474)	*(1.368)*	*(0.752)*	*(0.730)*
CSO_Dummy_{it}	-	-0.287**	-0.283**	-0.181	-0.180
		(-2.315)	*(-2.286)*	*(-1.457)*	*(-1.445)*
Constant		7.070***	7.041***	6.538***	6.517***
		(8.017)	*(7.923)*	*(7.481)*	*(7.421)*
R^2 *(Overall)*		0.473	0.471	0.549	0.549
Wald chi^2		141.31***	132.39***	171.96***	170.93***
Number of Observations		432	432	432	432
Random Effects		√	√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table A2 - Model 2 using Change in Total Assets as Economic Size Measure

$$\%\Delta CEO\ Comp_{it} = \alpha_t + \beta_1 \Delta Performance_{it} + \beta_2 \%\Delta Economic\ Controls_{it} + \beta_3 \%\Delta Governance\ Controls_{it} + \beta_4 Governance\ Controls_{it}$$

Dependent Variable %ΔCEO Total Comp	Predicted Sign	ΔROA *(Col 1)*	ΔProfit Margin *(Col 2)*	ΔAsset T/O *(Col 3)*	ΔProfit Margin + ΔAsset T/O *(Col 4)*
$\Delta ROA\%_{it}$	+	0.025			
		(0.243)			
$\Delta Profit\ Margin_{it}$	+		0.002		-0.002
			(0.128)		*(-0.093)*
$\Delta Asset\ Turnover_{it}$	+			0.080	0.080
				(1.092)	*(1.086)*
$\%\Delta Total\_Assets_{it}$	+	0.160	0.161	0.168	0.168
		(1.481)	*(1.525)*	*(1.598)*	*(1.572)*
$Net\ Loss\ Dummy_{it}$	-	0.009	0.009	0.009	0.009
		(0.307)	*(0.277)*	*(0.297)*	*(0.277)*
$Board\ Size_{it}$	+	-0.001	-0.001	0.000	0.000
		(-0.111)	*(-0.115)*	*(-0.059)*	*(-0.058)*
$\%\ Indep\ Directors_{it}$	+	0.202**	0.203*	0.203**	0.203**
		(2.006)	*(2.026)*	*(2.028)*	*(2.021)*
$Gov\_Grants\_Dummy_{it}$	+	-0.003	-0.003	-0.003	-0.003
		(-0.165)	*(-0.161)*	*(-0.167)*	*(-0.174)*
$\%\Delta\$Net\_Board\_Comp_{it}$	+	0.176	0.176	0.177	0.177
		(1.569)	*(1.556)*	*(1.590)*	*(1.579)*
$Regulated\ Price\ Dummy_{it}$	-	-0.014	-0.014	-0.013	-0.012
		(-0.601)	*(-0.608)*	*(-0.549)*	*(-0.538)*
CSO_Dummy_{it}	-	-0.021	-0.021	-0.021	-0.021
		(-0.730)	*(-0.728)*	*(-0.719)*	*(-0.718)*
Constant	+	-0.099	-0.099	-0.105	-0.105
		(-1.086)	*(-1.092)*	*(-1.140)*	*(-1.142)*
R^2 *(Overall)*		0.131	0.131	0.134	0.134
Wald chi^2		15.87*	14.080	12.450	14.650
Number of Observations		332	332	332	332
Random Effects		√	√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets

(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table A3 - Model 3 using Total Assets as the alternate Economic Size Measure.

$Performance_{it+1} = \alpha_t + \beta_1 Ln\ CEO\ Total\ Comp_{it} + \beta_2 Economic\ Control_{it} + \beta_3 Governance\ Controls_{it}$

Dependent Variable **(i) ROA_{it+1} *(Col 1)*** **(ii) Profit $Margin_{it+1}$ *(Col 2)*** **(iii) Asset $Turnover_{it+1}$ *(Col 3)***	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ *(Col 3)*
Ln CEO Total $Comp_{it}$	+	0.022	0.045	0.252***
		(1.566)	*(1.217)*	*(2.766)*
Ln Total $Assets_{it}$	+	-0.006**	-0.015	-0.105
		(-2.148)	*(-1.086)*	*(-1.584)*
Net Loss $Dummy_{it}$	-	-0.022**	-0.216***	-0.016
		(-2.079)	*(-3.826)*	*(-0.819)*
Board $Size_{it}$	+	0.005*	0.004	-0.028
		(1.871)	*(0.453)*	*(-1.443)*
% Indep $Directors_{it}$	+	0.038	0.332	0.059
		(1.045)	*(1.581)*	*(0.270)*
$Gov\_Grants\_Dummy_{it}$	+	0.000	0.087*	-0.065
		(0.041)	*(2.215)*	*(-1.472)*
$Ln\_\$Net\_Board\_Comp_{it}$	+	0.000	0.019	0.004
		(0.025)	*(0.733)*	*(0.039)*
Regulated Price $Dummy_{it}$	-	-0.022**	-0.061*	0.113
		(-2.482)	*(-1.770)*	*(1.156)*
CSO_Dummy_{it}	-	-0.007	-0.017	-0.336***
		(-0.848)	*(-0.423)*	*(-3.330)*
Constant		-0.170	-0.706	-0.459
		(-1.086)	*(-1.121)*	*(-0.457)*
R^2 *(Overall)*		0.147	0.124	0.271
Wald chi^2		43.28***	56.50***	36.79***
Number of Observations		332	332	332
Random Effects		√	√	√

Note:

(i) The 'z' score statistics are determined using robust standard errors and are reported in brackets
(ii) '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table A4 - Model 3 - 1SLS results with the economic size measure being Total Assets.

$$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1 \text{Economic Control}_{it} + \beta_2 \text{Governance Controls}_{it} + \beta_3 \text{IV Rec\_GICS}_i$$

Dependent Variable ln CEO Total Comp	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ *(Col 3)*
Ln Total $Assets_{it}$	+	0.089***	0.088***	0.214***
		(4.270)	*(4.310)*	*(5.840)*
Net Loss $Dummy_{it}$	-	-0.064*	-0.069**	0.000
		(-1.890)	*(-2.020)*	*(0.000)*
$Board\_Size_{it}$	+	0.001	0.001	-0.008
		(0.040)	*(0.080)*	*(-0.770)*
% Indep $Directors_{it}$	+	-0.205	-0.177	-0.845***
		(-0.870)	*(-0.760)*	*(-2.690)*
$Gov\_Grants\_Dummy_{it}$	+	-0.013	-0.021	0.133***
		(-0.290)	*(-0.470)*	*(3.360)*
$Ln\_\$Net\_Board\_Comp_{it}$	+	0.258***	0.257***	0.250***
		(4.880)	*(4.910)*	*(3.850)*
Regulated Price $Dummy_{it}$	-	0.191**	0.198***	0.187***
		(2.500)	*(2.650)*	*(2.300)*
CSO_Dummy_{it}	-	-0.311***	-0.311***	-0.342
		(-3.630)	*(-3.660)*	*(-0.880)*
IV Rec_GICS	+ / -	-0.001	-0.001	-0.001
		(-0.660)	*(-0.610)*	*(-0.120)*
Constant		7.941***	7.948***	6.046***
		(13.450)	*(13.540)*	*(5.860)*
R^2 *(Overall)*		0.478	0.478	0.478
Wald chi^2		141.40***	141.4***	141.4***
Number of Observations		332	332	332
Random Effects		√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets

ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table A5 - Model 3 - 2SLS results using Total Assets as the Economic Size measure.

$$\textbf{Performance}_{it+1} = \alpha_t + \beta_1 \ln \textbf{CEO Total Comp}_{it} + \beta_2 \textbf{Economic Control}_{it} + B_3 \textbf{Governance Controls}_{it}$$

Dependent Variable **(i) ROA_{it+1} *(Col 1)*** **(ii) Profit $Margin_{it+1}$ *(Col 2)*** **(iii) Asset $Turnover_{it+1}$ *(Col 3)***	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ (*Col 3)*
Ln CEO Total $Comp_{it}$	+	0.010	1.250	-6.973
		(0.040)	*(0.503)*	*(-0.246)*
Ln Total $Assets_{it}$	+	-0.007	-0.126	1.534
		(-0.306)	*(-0.554)*	*(0.249)*
Net Loss $Dummy_{it}$	-	-0.017	-0.036	-0.008
		(-0.858)	*(-0.183)*	*(-0.034)*
Board $Size_{it}$	+	0.005*	0.011	-0.089
		(1.924)	*(0.518)*	*(-0.343)*
% Indep $Directors_{it}$	+	0.039	0.525	-6.026
		(0.584)	*(0.826)*	*(-0.250)*
$Gov\_Grants\_Dummy_{it}$	+	0.001	0.081	0.888
		(0.191)	*(0.852)*	*(0.238)*
$Ln\_\$Net\_Board\_Comp_{it}$	+	0.005	-0.290	1.756
		(0.082)	*(-0.456)*	*(0.249)*
Regulated Price $Dummy_{it}$	-	-0.022	-0.314	1.463
		(-0.420)	*(-0.588)*	*(0.266)*
CSO_Dummy_{it}	-	-0.012	0.320	-2.719
		(-0.156)	*(0.423)*	*(-0.286)*
Constant		-0.072	-10.212	41.825
		(-0.037)	*(-0.516)*	*(0.246)*
R^2 *(Overall)*		0.125	0.018	0.163
Wald chi^2		31.13***	5.560	0.490
Number of Observations		332	332	332
Random Effects		√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets

ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table A6 - Model 4 using ΔTotal Assets as the economic size measure.

$$\Delta Performance_{t+1} = \alpha_t + \beta_1 \%\Delta CEO\ Total\ Comp_{it} + \beta_2 \%\Delta Economic\ Control_{it} + \beta_3 \%\Delta Governance\ Controls_{it} + \beta_4 Governance\ Controls_{it}$$

Dependent Variable **(i) ΔROA_{it+1}** ***(col 1)*** **(ii) ΔProfit $Margin_{it+1}$** ***(col 2)*** **(iii) ΔAsset $Turnover_{it+1}$ (col 3)**	**Predicted Sign**	**ΔROA_{it+1}** ***(Col 1)***	**ΔProfit $Margin_{it+1}$** ***(Col 2)***	**ΔAsset $Turnover_{it+1}$** ***(Col 3)***
$\%\Delta$CEO Total $Comp_{it}$	+	-0.013	0.021	-0.052
		(-0.613)	*(0.268)*	*(-0.927)*
$\%\Delta Total\_Assets_{it}$	+	-0.04	-0.19	0.015
		(-1.180)	*(-0.991)*	*(0.466)*
Net Loss $Dummy_{it}$	-	0.048***	0.258***	0.030*
		(3.387)	*(3.129)*	*(1.857)*
Board $Size_{it}$	+	0.000	0.008	0.007
		(-0.240)	*(0.977)*	*(0.607)*
% Indep $Directors_{it}$	+	-0.004	-0.145*	-0.087
		(-0.176)	*(-1.663)*	*(-0.599)*
$Gov\_Grants\_Dummy_{it}$	+	0.002	-0.009	0.001
		(0.374)	*(-0.369)*	*(0.045)*
$\%\Delta\$Net\_Board\_Comp_{it}$	+	0.001	-0.038	0.017
		(0.054)	*(-0.493)*	*(0.588)*
Regulated Price $Dummy_{it}$	-	-0.001	-0.039	-0.014
		(-0.129)	*(-1.337)*	*(-0.571)*
CSO_Dummy_{it}	-	-0.013**	-0.041	-0.016
		(-1.986)	*(-1.369)*	*(-0.989)*
Constant		0.008	0.092	0.049
		(0.397)	*(0.946)*	*(0.572)*
R^2 *(Overall)*		0.096	0.072	0.021
Wald chi^2		18.62*	19.68**	6.580
Number of Observations		232	232	232
Random Effects		√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets

ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table A7 - Model 5 using Total Assets as the economic size measure.

$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1\text{Performance}_{it} + \beta_2\text{Economic Controls}_{it} + \beta_3\text{Governance Controls}_{it} + \beta_4\text{Utilities (GICS Sector) Dummy}_{it} + \beta_5\text{VIC (State) Dummy}_{it}$

Dependent Variable ln CEO Total Comp_{it}	Predicted Sign	ROA_{it} *(Col 1)*	Profit Margin_{it} *(Col 2)*	Asset Turnover_{it} *(Col 3)*	Profit Margin_{it} + Asset Turnover_{it} *(Col 4)*
$\text{ROA\%}_{it}$	+	0.204			
		(0.896)			
Profit Margin %	+		-0.017		-0.026
			(-0.899)		*(-1.274)*
Asset Turnover	+			0.249***	0.250***
				(4.079)	*(4.058)*
Ln Total Assets_{it}	+	0.148***	0.151***	0.177***	0.179***
		(4.693)	*(4.867)*	*(6.217)*	*(6.224)*
Net Loss Dummy_{it}	-	-0.004	-0.029	-0.007	-0.017
		(-0.113)	*(-0.919)*	*(-0.253)*	*(-0.564)*
Board Size_{it}	+	-0.012	-0.012	-0.008	-0.008
		(-0.993)	*(-0.982)*	*(-0.698)*	*(-0.691)*
% Indep Directors_{it}	+	-0.09	-0.075	-0.042	-0.033
		(-0.365)	*(-0.300)*	*(-0.173)*	*(-0.138)*
$\text{Gov\_Grants\_Dummy}_{it}$	+	0.053	0.051	0.052	0.052
		(1.083)	*(1.051)*	*(1.086)*	*(1.080)*
$\text{Ln\_\$Net\_Board\_Comp}_{it}$	+	0.233***	0.232**	0.218***	0.218***
		(3.249)	*(3.223)*	*(3.328)*	*(3.310)*
Regulated Price Dummy_{it}	-	0.263**	0.254**	0.173	0.17
		(2.115)	*(2.044)*	*(1.364)*	*(1.337)*
$\text{Utilities(GICS Sector)}_{it}$	+	-0.31	-0.312	-0.236	-0.235
		(-1.581)	*(-1.599)*	*(-1.416)*	*(-1.412)*
VIC_{it}	+	-0.172	-0.173	-0.255**	-0.256**
		(-1.406)	*(-1.435)*	*(-2.200)*	*(-2.202)*
CSO_Dummy_{it}	-	-0.061	-0.055	0.087	0.088
		(-0.284)	*(-0.261)*	*(0.453)*	*(0.460)*
Constant		7.095***	7.051***	6.509***	6.484***
		(8.297)	*(8.166)*	*(7.769)*	*(7.700)*
R^2 *(Overall)*		0.536	0.535	0.610	0.610
Wald chi^2		153.53***	149.58***	189.24***	187.87***
Number of Observations		432	432	432	432
Random Effects		√	√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets

ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table A8 - Model 6 using ΔTotal Assets as the economic size measure.

$$\%\Delta\text{CEO Total Comp}_{it} = \alpha_t + \beta_1\Delta\text{Performance}_{it} + \beta_2\%\Delta\text{Economic Controls}_{it} + \beta_3\text{Governance Controls}_{it} + \beta_4\%\Delta\text{Governance Controls}_{it} + \beta_5\text{Utilities (GICS Sector) Dummy}_{it} + \beta_6\text{VIC (State) Dummy}_{it}$$

Dependent Variable %ΔCEO Total Comp	Predicted Sign	ΔROA_{it} *(Col 1)*	$\Delta\text{Profit Margin}_{it}$ *(Col 2)*	$\Delta\text{Asset Turnover}_{it}$ *(Col 3)*	$\Delta\text{Profit Margin}_{it}$ + $\Delta\text{Asset T/O}_{it}$ *(Col 4)*
$\Delta\text{ROA}\%_{it}$	+	0.035			
		(0.327)			
ΔProfit Margin %	+		0.004		0.000
			(0.216)		*(0.002)*
ΔAsset Turnover	+			0.090	0.090
				(1.220)	*(1.213)*
$\%\Delta\text{Total\_Assets}_{it}$	+	0.160	0.162	0.170	0.170
		(1.475)	*(1.520)*	*(1.605)*	*(1.576)*
$\text{Net Loss Dummy}_{it}$	-	0.015	0.015	0.016	0.016
		(0.449)	*(0.414)*	*(0.460)*	*(0.441)*
Board Size_{it}	+	0.001	0.001	0.001	0.001
		(0.083)	*(0.078)*	*(0.168)*	*(0.166)*
$\%\ \text{Indep Directors}_{it}$	+	0.208**	0.209**	0.210**	0.210**
		(2.054)	*(2.071)*	*(2.087)*	*(2.080)*
$\text{Gov\_Grants\_Dummy}_{it}$	+	-0.003	-0.003	-0.003	-0.004
		(-0.136)	*(-0.128)*	*(-0.166)*	*(-0.173)*
$\%\Delta\text{Net\_Board\_Comp}_{it}$	+	0.173	0.173	0.174	0.174
		(1.545)	*(1.531)*	*(1.571)*	*(1.558)*
$\text{Regulated Price Dummy}_{it}$	-	-0.002	-0.002	-0.003	-0.003
		(-0.042)	*(-0.045)*	*(-0.085)*	*(-0.074)*
$\text{Utilities (GICS Sector)}_{it}$	+	-0.017	-0.017	-0.013	-0.013
		(-0.397)	*(-0.400)*	*(-0.301)*	*(-0.303)*
VIC_{it}	+	-0.047	-0.047	-0.050*	-0.050*
		(-1.614)	*(-1.605)*	*(-1.714)*	*(-1.692)*
CSO_Dummy_{it}	-	0.013	0.013	0.015	0.015
		(0.376)	*(0.376)*	*(0.432)*	*(0.429)*
Constant	+	-0.109	-0.109	-0.117	-0.117
		(-1.129)	*(-1.133)*	*(-1.194)*	*(-1.196)*
R^2 *(Overall)*		0.137	0.137	0.142	0.142
Wald chi^2		16.180	14.960	15.110	15.630
Number of Observations		332	332	332	332
Random Effects		√	√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*
ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Appendix B – Sensitivity Results using Bonus Payments as alternative Compensation measure

Table B1 - Model 1 using CEO Bonus as the dependent variable.

$$\text{Ln CEO Bonus}_{it} = \alpha_t + \beta_1 \text{Performance}_{it} + \beta_2 \text{Economic Control}_{it} + \beta_3 \text{Governance Controls}_{it}$$

Dependent Variable ln CEO Bonus	Predicted Sign	ROA *(Col 1)*	Profit Margin *(Col 2)*	Asset Turnover *(Col 3)*	Profit Margin + Asset T/O *(Col 4)*
$ROA\%_{it}$	+	1.546			
		(1.101)			
Profit Margin %	+		0.413		0.507
			(1.084)		*(1.297)*
Asset Turnover	+			0.197	0.220
				(1.140)	*(1.235)*
Ln Total $Revenue_{it}$	+	0.230***	0.261***	0.214***	0.211***
		(2.656)	*(3.300)*	*(2.871)*	*(2.831)*
Net Loss $Dummy_{it}$	-	0.288**	0.293**	(0.181)	0.312**
		(1.987)	*(1.978)*	*(1.470)*	*(2.113)*
Board $Size_{it}$	+	-0.061	-0.069	-0.062	-0.060
		(-0.690)	*(-0.768)*	*(-0.681)*	*(-0.676)*
% Indep $Directors_{it}$	+	-0.735	-0.688	-0.503	-0.643
		(-1.086)	*(-1.032)*	*(-0.860)*	*(-1.007)*
$Gov\_Grants\_Dummy_{it}$	+	0.281	0.250	0.309	0.331
		(1.327)	*(1.195)*	*(1.648)*	*(1.724)*
$Ln\_\$Net\_Board\_Comp_{it}$	+	0.283**	0.268**	0.293**	0.277**
		(2.226)	*(2.028)*	*(2.428)*	*(2.069)*
Regulated Price $Dummy_{it}$	-	0.693***	0.615***	0.641***	0.660***
		(2.748)	*(2.704)*	*(2.598)*	*(2.658)*
CSO_Dummy_{it}	-	1.871***	1.900***	1.857***	1.903***
		(5.433)	*(5.172)*	*(5.659)*	*(5.510)*
Constant		3.313	(2.959)	(3.307)	(3.564)
		(1.176)	*(1.110)*	*(1.265)*	*(1.284)*
R^2 *(Overall)*		0.7695	0.763	0.779	0.775
Wald chi^2		2102.12***	2216.62***	2490.96***	2161.48***
Number of Observations		94	94	94	94
Random Effects		√	√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets.*

ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B2 - Model 2 using %Δ CEO Bonus as the dependent variable.

$$\%\Delta CEO\ Bonus_{it} = \alpha_t + \beta_1 \Delta Performance_{it} + \beta_2 \%\Delta Economic\ Controls_{it} + \beta_3 \%\Delta Governance\ Controls_{it} + \beta_4 Governance\ Controls_{it}$$

Dependent Variable %ΔCEO Bonus	**Predicted Sign**	**ΔROA** ***(Col 1)***	**ΔProfit Margin** ***(Col 2)***	**ΔAsset Turnover** ***(Col 3)***	**ΔProfit Margin + ΔAsset T/O** ***(Col 4)***
ΔROA_{it}	+	-0.085			
		(-0.026)			
ΔProfit Margin $_{it}$	+		-0.11		-0.069
			(-0.118)		*(-0.073)*
ΔAsset Turnover$_{it}$	+			0.498	0.472
				(0.254)	*(0.235)*
$\%\Delta$Total_Revenue$_{it}$	+	-0.017	-0.016	-0.115	-0.105
		(-0.030)	*(-0.034)*	*(-0.195)*	*(-0.171)*
Net Loss Dummy$_{it}$	-	-0.299	-0.346	-0.298	-0.33
		(-0.238)	*(-0.262)*	*(-0.239)*	*(-0.248)*
Board Size$_{it}$	+	-0.288*	-0.289*	-0.292*	-0.292*
		(-1.681)	*(-1.716)*	*(-1.730)*	*(-1.716)*
% Indep Directors$_{it}$	+	0.774	0.79	0.839	0.848
		(0.436)	*(0.446)*	*(0.470)*	*(0.470)*
Gov_Grants_Dummy$_{it}$	+	-0.331	-0.319	-0.347	-0.338
		(-0.827)	*(-0.780)*	*(-0.875)*	*(-0.804)*
$\%\Delta$$Net_Board_Comp$_{it}$	+	-0.107	-0.115	-0.108	-0.114
		(-0.188)	*(-0.202)*	*(-0.192)*	*(-0.199)*
Regulated Price Dummy$_{it}$	-	0.182	0.178	0.207	0.203
		(0.435)	*(0.426)*	*(0.483)*	*(0.468)*
CSO_Dummy$_{it}$	-	0.319	0.323	0.288	0.293
		(0.464)	*(0.472)*	*(0.415)*	*(0.417)*
Constant	+	1.558	1.549	1.529	1.525
		(0.854)	*(0.849)*	*(0.838)*	*(0.828)*
R^2 *(Overall)*		0.063	0.063	0.064	0.064
Wald chi^2		3.850	3.860	3.920	3.850
Number of Observations		67	67	67	67
Random Effects		√	√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*
ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B3 - Model 3 using CEO Bonus as the compensation measure.

$$\textbf{Performance}_{it+1} = \alpha_t + \beta_1 \textbf{Ln CEO Bonus}_{it} + \beta_2 \textbf{Economic Control}_{it} + \beta_3 \textbf{Governance Controls}_{it}$$

Dependent Variable **(i) ROA_{it+1} *(Col 1)*** **(ii) Profit $Margin_{it+1}$ *(Col 2)*** **(iii) Asset $Turnover_{it+1}$ *(Col 3)***	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ *(Col 3)*
Ln CEO $Bonus_{it}$	+	0.008	0.004	0.000
		(1.570)	*(0.289)*	*(0.001)*
Ln Total $Revenue_{it}$	+	0.006	-0.033***	0.088
		(0.606)	*(-2.592)*	*(0.972)*
Net Loss $Dummy_{it}$	-	-0.043*	-0.181**	-0.232*
		(-1.751)	*(-2.212)*	*(-1.949)*
Board $Size_{it}$	+	0.004	-0.003	-0.075
		(0.486)	*(-0.135)*	*(-1.779)*
% Indep $Directors_{it}$	+	0.070	0.063	-0.571
		(0.646)	*(0.361)*	*(-0.430)*
Gov_Grants_$Dummy_{it}$	+	-0.015	0.035	0.007
		(-1.125)	*(0.589)*	*(0.115)*
Ln_$Net_Board_$Comp_{it}$	+	-0.012	0.020	-0.041
		(-0.424)	*(0.336)*	*(-1.324)*
Regulated Price $Dummy_{it}$	-	-0.059**	0.020	0.020
		(-2.166)	*(0.556)*	*(0.289)*
CSO_$Dummy_{it}$	-	0.000	-0.050	0.341
		(-0.002)	*(-0.812)*	*(0.886)*
Constant		-0.028	0.482	0.396
		(-0.068)	*(0.676)*	*(0.171)*
R^2 *(Overall)*		0.139	0.182	0.118
Wald chi^2		85.60***	68.95***	377.00***
Number of Observations		70	70	70
Random Effects		√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets
ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B4 - Model 3 - 1SLS using CEO Bonus as the compensation measure to assess possibility of endogeneity.

$$\text{Ln CEO Bonus}_{it} = \alpha_t + \beta_1 \text{Economic Control}_{it} + \beta_2 \text{Governance Controls}_{it} + \beta_3 \text{IV Rec\_GICS}_i$$

Dependent Variable ln CEO Bonus	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ *(Col 3)*
Ln Total $Revenue_{it}$	+	0.121	0.186	-0.231
		(0.610)	*(1.120)*	*(-0.620)*
Net Loss $Dummy_{it}$	-	0.663	0.623	1.088*
		(1.460)	*(1.630)*	*(1.660)*
Board $Size_{it}$	+	0.017	0.003	0.128
		(0.120)	*(0.030)*	*(0.620)*
% Indep $Directors_{it}$	+	-3.173	-2.639	-9.416
		(-0.930)	*(-1.070)*	*(-0.910)*
$Gov\_Grants\_Dummy_{it}$	+	0.022	0.022	-0.103
		(0.100)	*(0.100)*	*(-0.390)*
$Ln\_\$Net\_Board\_Comp_{it}$	+	0.078	0.086	0.147
		(0.370)	*(0.390)*	*(0.860)*
Regulated Price $Dummy_{it}$	-	1.014**	0.979**	1.039***
		(2.380)	*(2.030)*	*(4.470)*
CSO_Dummy_{it}	-	1.949***	1.807***	2.544*
		(3.540)	*(4.440)*	*(1.750)*
IV Rec_GICS	+ / -	0.007	0.007	0.007
		(1.120)	*(1.290)*	*(0.410)*
Constant		9.406*	7.677*	20.249
		(1.660)	*(1.690)*	*(1.580)*
R^2 *(Overall)*		0.768	0.768	0.767
Wald chi^2 *(G2SLS Stage 1)*		103***	205***	61***
Number of Observations		70	70	70
Random Effects		√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*
ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B5 - Model 3 - 2SLS results using CEO Bonus as the compensation measure.

$Performance_{it+1} = \alpha_t + \beta_1 ln\ CEO\ Bonus_{it} + \beta_2 Economic\ Control_{it} + B_3 Governance\ Controls_{it}$

Dependent Variable **(i) ROA_{it+1} *(Col 1)*** **(ii) Profit $Margin_{it+1}$ *(Col 2)*** **(iii) Asset $Turnover_{it+1}$ *(Col 3)***	**Predicted Sign**	ROA_{it+1} *(Col 1)*	Profit $Margin_{it+1}$ *(Col 2)*	Asset $Turnover_{it+1}$ (*Col 3*)
Ln CEO $Bonus_{it}$	+	-0.081	-0.144	-0.038
		(-1.626)	*(-1.078)*	*(-0.108)*
Ln Total $Revenue_{it}$	+	0.021	0.022	0.071
		(1.084)	*(0.516)*	*(0.571)*
Net Loss $Dummy_{it}$	-	0.014	-0.035	-0.206
		(0.283)	*(-0.321)*	*(-0.515)*
Board $Size_{it}$	+	-0.001	-0.008	-0.072
		(-0.064)	*(-0.397)*	*(-1.162)*
% Indep $Directors_{it}$	+	-0.156	-0.316	-0.991
		(-0.852)	*(-0.987)*	*(-0.237)*
$Gov\_Grants\_Dummy_{it}$	+	-0.012	0.009	0.019
		(-0.806)	*(0.179)*	*(0.279)*
$Ln\_\$Net\_Board\_Comp_{it}$	+	0.000	0.046	-0.034
		(0.009)	*(0.449)*	*(-0.566)*
Regulated Price $Dummy_{it}$	-	0.004	0.069	0.060
		(0.112)	*(0.800)*	*(0.155)*
CSO_Dummy_{it}	-	0.177**	0.184	0.461
		(2.313)	*(0.865)*	*(0.556)*
Constant		0.657	1.011	1.378
		(1.356)	*(0.911)*	*(0.167)*
R^2 *(Overall)*		0.001	0.070	0.070
Wald chi^2 *(G2SLS Stage 2)*		97.73***	114.94***	500.88**
Number of Observations		70	70	70
Random Effects		√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*
ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B6 - Model 4 using ΔCEO Bonus as the compensation measure.

$$\Delta Performance_{t+1} = \alpha_t + \beta_1 \%\Delta CEO\ Bonus_{it} + \beta_2 \%\Delta Economic\ Control_{it} + \beta_3 \%\Delta Governance\ Controls_{it} + \beta_4 Governance\ Controls_{it}$$

Dependent Variable **(i) ΔROA_{it+1}** ***(col 1)*** **(ii) $\%\Delta Profit\ Margin_{it+1}$** ***(col 2)*** **(iii) $\Delta Asset\ Turnover_{it+1}$ (col 3)**	**Predicted Sign**	**ΔROA_{it+1}** ***(Col 1)***	**$\Delta Profit\ Margin_{it+1}$** ***(Col 2)***	**$\Delta Asset\ Turnover_{it+1}$** ***(Col 3)***
$\%\Delta CEO\ Bonus_{it}$	+	0.005	0.031	-0.012
		(0.513)	*(0.730)*	*(-1.403)*
$\%\Delta Total\_Revenue_{it}$	+	-0.001	0.113	-0.132***
		(-0.011)	*(0.459)*	*(-4.884)*
$Net\ Loss\ Dummy_{it}$	-	0.096***	0.722***	-0.043*
		(6.970)	*(12.368)*	*(-1.735)*
$Board\ Size_{it}$	+	-0.010**	-0.027	0.01
		(-2.350)	*(-1.780)*	*(0.728)*
$\%\ Indep\ Directors_{it}$	+	-0.135***	-0.392*	0.035
		(-3.025)	*(-1.862)*	*(0.161)*
$Gov\_Grants\_Dummy_{it}$	+	0.011	0.057	-0.014
		(0.839)	*(1.168)*	*(-0.225)*
$\%\Delta\$Net\_Board\_Comp_{it}$	+	-0.01	-0.037	0.029
		(-0.575)	*(-0.800)*	*(0.732)*
$Regulated\ Price\ Dummy_{it}$	-	0.005	0.025	-0.055
		(0.505)	*(0.710)*	*(-1.008)*
CSO_Dummy_{it}	-	0.006	0.011	0.096
		(0.603)	*(0.464)*	*(1.748)*
Constant		0.184***	0.502**	-0.061
		(3.239)	*(2.031)*	*(-0.360)*
R^2 *(Overall)*		0.162	0.373	0.158
Wald chi^2		6.770	20.86**	8.150
Number of Observations		45	45	45
Random Effects		√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*
ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B7 - Model 5 using CEO Bonus as the dependent variable.

$$\text{Ln CEO Bonus}_{it} = \alpha_t + \beta_1\text{Performance}_{it} + \beta_2\text{Economic Controls}_{it} + \beta_3\text{Governance Controls}_{it} + \beta_4\text{Utilities (GICS Sector) Dummy}_{it} + \beta_5\text{VIC (State) Dummy}_{it}$$

Dependent Variable ln CEO Bonus$_{it}$	Predicted Sign	ROA$_{it}$ *(Col 1)*	Profit Margin$_{it}$ *(Col 2)*	Asset Turnover$_{it}$ *(Col 3)*	Profit Margin$_{it}$ + Asset Turnover$_{it}$ *(Col 4)*
ROA%$_{it}$	+	1.357			
		(0.942)			
Profit Margin %	+		0.447		0.523
			(1.162)		*(1.303)*
Asset Turnover	+			*(0.124)*	*(0.147)*
				(1.465)	*(1.626)*
Ln Total Revenue$_{it}$	+	0.256**	0.285***	0.250***	0.254***
		(3.081)	*(3.733)*	*(3.521)*	*(3.565)*
Net Loss Dummy$_{it}$	-	0.339**	0.379**	0.240**	0.385**
		(2.290)	*(2.589)*	*(2.060)*	*(2.552)*
Board Size$_{it}$	+	-0.086	-0.094	-0.086	-0.085
		(-1.027)	*(-1.133)*	*(-1.013)*	-1.026
% Indep Directors$_{it}$	+	-0.587	-0.553	-0.418	-0.537
		(-1.082)	*(-1.061)*	*(-0.871)*	*(-1.019)*
Gov_Grants_Dummy$_{it}$	+	0.338*	0.306	0.347*	0.365*
		(1.753)	*(1.609)*	*(1.834)*	*(1.871)*
Ln_Net_Board_Comp_{it}$	+	0.332***	0.330***	0.337***	0.329***
		2.826	*(2.690)*	*(3.005)*	*(2.591)*
Regulated Price Dummy$_{it}$	-	1.408***	1.403***	1.331***	1.340***
		(4.724)	*(4.750)*	*(4.769)*	*(4.753)*
Utilities(GICS Sector)$_{it}$	+	-1.000***	-1.071***	-0.961***	-0.975***
		(-5.562)	*(-5.536)*	*(-5.875)*	*(-5.858)*
VIC$_{it}$	+	0.000	0.000	0.000	0.000
		omitted - VIC no bonuses			
CSO_Dummy$_{it}$	-	0.990***	0.946***	1.014***	1.035***
		(5.968)	*(6.332)*	*(6.588)*	*(6.249)*
Constant		2.303	1.845	2.246	2.275
		(0.926)	*(0.803)*	*(0.980)*	*(0.951)*
R^2 *(Overall)*		0.829	0.829	0.829	0.830
Wald chi^2		134.02***	145.35***	136.49***	133.41***
Number of Observations		94	94	94	94
Random Effects		√	√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*
ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B8 - Model 6 using %ΔCEO Bonus as the dependent variable.

$$\%\Delta\text{CEO Bonus}_{it} = \alpha_t + \beta_1\Delta\text{Performance}_{it} + \beta_2\%\Delta\text{Economic Controls}_{it} + \beta_3\text{Governance Controls}_{it} + \beta_4\%\Delta\text{Governance Controls}_{it} + \beta_5\text{Utilities (GICS Sector) Dummy}_{it} + \beta_6\text{VIC (State) Dummy}_{it}$$

Dependent Variable %ΔCEO Bonus	Predicted Sign	ΔROA_{it} *(Col 1)*	ΔProfit Margin$_{it}$ *(Col 2)*	ΔAsset Turnover$_{it}$ *(Col 3)*	ΔProfit Margin$_{it}$ + ΔAsset T/O$_{it}$ *(Col 4)*
ΔROA_{it}	+	-0.096			
		(-0.102)			
ΔProfit Margin$_{it}$	+		-0.123		-0.084
			(-0.326)		*(-0.197)*
ΔAsset Turnover$_{it}$	+			0.447	0.410
				(0.302)	*(0.262)*
$\%\Delta$Total_Revenue$_{it}$	+	-0.015	-0.015	-0.105	-0.092
		(-0.083)	*(-0.078)*	*(-0.344)*	*(-0.311)*
Net Loss Dummy$_{it}$	-	-0.289	-0.341	-0.290*	-0.329
		(-1.438)	*(-1.037)*	*(-1.651)*	*(-0.969)*
Board Size$_{it}$	+	-0.299**	-0.300**	-0.299**	-0.300**
		(-1.988)	*(-2.050)*	*(-2.087)*	*(-2.060)*
% Indep Directors$_{it}$	+	0.774	0.791	0.831	0.841
		(0.602)	*(0.607)*	*(0.672)*	*(0.664)*
Gov_Grants_Dummy$_{it}$	+	-0.305	-0.290	-0.328	-0.314
		(-1.349)	*(-1.179)*	*(-1.392)*	*(-1.178)*
$\%\Delta$Net_Board_Comp$_{it}$	+	-0.107	-0.116	-0.108	-0.115
		(-0.264)	*(-0.287)*	*(-0.276)*	*(-0.286)*
Regulated Price Dummy$_{it}$	-	0.262	0.262	0.261	0.262
		(1.038)	*(1.042)*	*(1.058)*	*(1.050)*
Utilities (GICS Sector)$_{it}$	+	-0.103	-0.109	-0.072	-0.079
		(-0.423)	*(-0.425)*	*(-0.266)*	*(-0.265)*
VIC$_{it}$	+	0.000	0.000	0.000	0.000
		omitted -VIC no bonuses			
CSO_Dummy$_{it}$	-	0.260***	0.261***	0.249***	0.252***
		(3.180)	*(3.495)*	*(3.426)*	*(3.206)*
Constant	+	1.623	1.617	1.578	1.578
		(0.933)	*(0.929)*	*(0.918)*	*(0.910)*
R^2 *(Overall)*		0.064	0.064	0.065	0.065
Wald chi^2		3.810	3.830	3.860	3.800
Number of Observations		67	67	67	67
Random Effects		√	√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*

ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table B9 - Logistic Regression using and Indicator variable for Bonus Payment.

$$Bonus_{it} = \alpha_t + \beta_1 \Delta Performance_{it} + \beta_2 \%\Delta Economic\ Controls_{it} + \beta_3 Governance\ Controls_{it} + \beta_4 \%\Delta Governance\ Controls_{it}$$

Dependent Variable Bonus Indicator Variable 1=Bonus 0=No Bonus	Predicted Sign	ROA_{it} *(Col 1)*	Profit $Margin_{it}$ *(Col 2)*	Asset $Turnover_{it}$ *(Col 3)*	Profit $Margin_{it}$ + Asset T/O_{it} *(Col 4)*
$ROA\%_{it}$	+	4.219			
		(0.479)			
Profit Margin %	+		-0.427		-0.613
			(-0.276)		*(-0.273)*
Asset Turnover	+			1.072	1.083
				(0.370)	*(0.368)*
Ln Total $Revenue_{it}$	+	-0.404	-0.159	-0.181	-0.186
		(-0.245)	*(-0.124)*	*(-0.132)*	*(-0.134)*
Net Loss $Dummy_{it}$	+	1.103	0.502	0.754	0.545
		(0.588)	*(0.297)*	*(0.397)*	*(0.321)*
Board $Size_{it}$	+	-0.200	-0.296	-0.208	-0.208
		(-0.401)	*(-0.611)*	*(-0.443)*	*(-0.438)*
% Indep $Directors_{it}$	-	-20.909	-24.089	-20.720	-21.029
		(-0.433)	*(-0.471)*	*(-0.423)*	*(-0.415)*
$Gov\_Grants\_Dummy_{it}$	-	-4.237	-4.002	-3.978	-4.079
		(-0.573)	*(-0.619)*	*(-0.591)*	*(-0.568)*
$Ln\_\$Net\_Board\_Comp_{it}$	-	2.230	2.977	2.197	2.284
		(0.587)	*(0.644)*	*(0.587)*	*(0.583)*
Regulated Price $Dummy_{it}$	-	3.228	2.569	2.960	2.859
		(0.488)	*(0.471)*	*(0.453)*	*(0.449)*
CSO_Dummy_{it}	-	-8.260	-13.871	-12.447	-13.210
		(-0.306)	*(-0.342)*	*(-0.319)*	*(-0.316)*
Constant		-9.851	-19.148	-13.918	-14.481
		(-0.326)	*(-0.533)*	*(-0.445)*	*(-0.450)*
Log pseudolikelihood		-87.698	-86.819	-86.935	-86.582
Wald chi^2		1.410	0.980	0.840	1.190
Prob>chi^2		0.998	1.000	1.000	1.000
Number of Observations		432	432	432	432
Random Effects		√	√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets

ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Appendix C – Sensitivity Results using Lagged (Prior Year) Performance Measures

Table C1 - Model 1 using one (1) year lagged performance measures.

$$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1\text{Performance}_{it-1} + \beta_2\text{Economic Control}_{it} + \beta_3\text{Governance Controls}_{it}$$

Dependent Variable ln CEO Total Comp	Predicted Sign	ROA_{it-1} *(Col 1)*	Profit $Margin_{it-1}$ *(Col 2)*	Asset $Turnover_{it-1}$ *(Col 3)*	Profit $Margin_{it-1}$ + Asset T/O_{it-1} *(Col 4)*
$ROA\%_{it-1}$	+	0.091			
		(0.679)			
Profit Margin $\%_{it-1}$	+		0.003		-0.001
			(0.163)		*(-0.066)*
Asset $Turnover_{it-1}$	+			0.078*	0.078*
				(1.947)	*(1.945)*
Ln Total $Revenue_{it}$	+	0.189***	0.189***	0.182***	0.182***
		(6.895)	*(6.837)*	*(6.755)*	*(6.710)*
Net Loss $Dummy_{it}$	-	0.042**	0.042**	0.044**	0.044**
		(2.112)	*(2.089)*	*(2.251)*	*(2.219)*
Board $Size_{it}$	+	-0.011	-0.012	-0.012	-0.012
		(-1.102)	*(-1.117)*	*(-1.161)*	*(-1.146)*
% Indep $Directors_{it}$	+	0.200	0.202	0.207	0.207
		(0.982)	*(0.985)*	*(1.017)*	*(1.016)*
$Gov\_Grants\_Dummy_{it}$	+	0.009	0.008	0.009	0.009
		(0.200)	*(0.174)*	*(0.187)*	*(0.186)*
$Ln\_\$Net\_Board\_Comp_{it}$	+	0.164***	0.163***	0.168***	0.168***
		(2.930)	*(2.925)*	*(2.938)*	*(2.933)*
Regulated Price $Dummy_{it}$	-	0.032	0.032	0.032	0.032
		(0.393)	*(0.382)*	*(0.381)*	*(0.380)*
CSO_Dummy_{it}	-	-0.066	-0.066	-0.045	-0.045
		(-0.554)	*(-0.552)*	*(-0.373)*	*(-0.373)*
Constant		7.082***	7.087***	7.114***	7.115***
		(8.156)	*(8.120)*	*(8.406)*	*(8.354)*
R^2 *(Overall)*		0.619	0.617	0.624	0.624
Wald chi^2		232.99***	234.14***	221.20***	227.31***
Number of Observations		332	332	332	332
Random Effects		√	√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets
ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table C2 - Model 2 using change (Δ) in lagged performance measures.

$$\%\Delta\text{CEO Total Comp}_{it} = \alpha_t + \beta_1(\text{Performance}_{it-1} - \text{Performance}_{it-2}) + \beta_2\%\Delta\text{Economic Controls}_{it} + \beta_3\%\Delta\text{Governance Controls}_{it} + \beta_4\text{Governance Controls}_{it}$$

Dependent Variable %ΔCEO Total Comp	Predicted Sign	ΔROA_{it-1} (*Col 1*)	ΔProfit Margin$_{it-1}$ (*Col 2*)	ΔAsset Turnover$_{it-1}$ (*Col 3*)	ΔProfit Margin$_{it-1}$ + ΔAsset Turnover$_{it-1}$ (*Col 4*)
ΔROA_{it-1}	+	0.356			
		(1.242)			
ΔProfit Margin$_{it-1}$	+		0.024		0.025
			(0.691)		*(0.721)*
ΔAsset Turnover$_{it-1}$	+			-0.045	-0.050
				(-1.106)	*(-1.110)*
$\%\Delta$Total_Revenue$_{it}$	+	0.022	0.023	0.015	0.023
		(1.145)	*(0.905)*	*(0.941)*	*(0.923)*
Net Loss Dummy$_{it}$	-	-0.006	-0.007	-0.009	-0.007
		(-0.168)	*(-0.197)*	*(-0.256)*	*(-0.181)*
Board Size$_{it}$	+	0.007	0.006	0.006	0.006
		(0.973)	*(0.892)*	*(0.867)*	*(0.869)*
% Indep Directors$_{it}$	+	0.175**	0.179**	0.178**	0.183**
		(2.263)	*(2.217)*	*(2.247)*	*(2.229)*
Gov_Grants_Dummy$_{it}$	+	0.016	0.013	0.013	0.013
		(0.827)	*(0.627)*	*(0.588)*	*(0.639)*
$\%\Delta$$Net_Board_Comp$_{it}$	+	0.015	0.015	0.012	0.014
		(0.246)	*(0.235)*	*(0.192)*	*(0.230)*
Regulated Price Dummy$_{it}$	-	-0.008	-0.010	-0.011	-0.011
		(-0.320)	*(-0.409)*	*(-0.492)*	*(-0.468)*
CSO_Dummy$_{it}$	-	-0.027	-0.024	-0.024	-0.024
		(-0.944)	*(-0.899)*	*(-0.909)*	*(-0.903)*
Constant	+	-0.122	-0.117	-0.110	-0.117
		(-1.385)	*(-1.271)*	*(-1.274)*	*(-1.265)*
R^2 *(Overall)*		0.053	0.028	0.026	0.030
Wald chi^2		19.80*	20.14*	19.86*	20.39*
Number of Observations		232	232	232	232
Random Effects		√	√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets

ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table C3 - Model 5 using lagged performance measures as regressors.

$\text{Ln CEO Total Comp}_{it} = \alpha_t + \beta_1\text{Performance}_{it-1} + \beta_2\text{Economic Controls}_{it} + \beta_3\text{Governance Controls}_{it} + \beta_4\text{Utilities (GICS Sector) Dummy}_{it} + \beta_5\text{VIC (State) Dummy}_{it}$

Dependent Variable ln CEO Total Comp_{it}	Predicted Sign	ROA_{it-1} *(Col 1)*	Profit Margin_{it-1} *(Col 2)*	Asset Turnover_{it-1} *(Col 3)*	Profit Margin_{it-1} + Asset Turnover_{it-1} *(Col 4)*
$\text{ROA\%}_{it-1}$	+	0.071			
		(0.536)			
Profit Margin $\%_{it-1}$	+		0.001		-0.004
			(0.043)		*(-0.218)*
$\text{Asset Turnover}_{it-1}$	+			0.080**	0.080**
				(2.206)	*(2.201)*
$\text{Ln Total Revenue}_{it}$	+	0.186***	0.186***	0.179***	0.179***
		(7.282)	*(7.233)*	*(6.928)*	*(6.879)*
$\text{Net Loss Dummy}_{it}$	-	0.042**	0.043**	0.045**	0.045**
		(2.113)	*(2.106)*	*(2.285)*	*(2.261)*
Board Size_{it}	+	-0.012	-0.012	-0.012	-0.012
		(-1.096)	*(-1.111)*	*(-1.095)*	*(-1.092)*
$\%\ \text{Indep Directors}_{it}$	+	0.203	0.205	0.206	0.207
		(0.990)	*(0.990)*	*(1.014)*	*(1.012)*
$\text{Gov\_Grants\_Dummy}_{it}$	+	0.010	0.010	0.009	0.009
		(0.222)	*(0.213)*	*(0.193)*	*(0.195)*
$\text{Ln\_\$Net\_Board\_Comp}_{it}$	+	0.167***	0.167***	0.173***	0.173***
		(2.952)	*(2.941)*	*(2.966)*	*(2.959)*
$\text{Regulated Price Dummy}_{it}$	-	0.149	0.147	0.119	0.118
		(1.060)	*(1.055)*	*(0.886)*	*(0.881)*
$\text{Utilities(GICS Sector)}_{it}$	+	-0.177	-0.177	-0.130	-0.129
		(-0.959)	*(-0.960)*	*(-0.742)*	*(-0.735)*
VIC_{it}	+	-0.248	-0.250	-0.261	-0.262
		(-1.476)	*(-1.486)*	*(-1.587)*	*(-1.585)*
CSO_Dummy_{it}	-	0.148	0.150	0.168	0.168
		(0.644)	*(0.652)*	*(0.738)*	*(0.737)*
Constant		7.146***	7.145***	7.153***	7.155***
		(8.983)	*(8.926)*	*(9.058)*	*(9.013)*
R^2 *(Overall)*		0.657	0.655	0.662	0.662
Wald chi^2		248.96***	247.08***	230.08***	228.98***
Number of Observations		332	332	332	332
Random Effects		√	√	√	√

Note:

i. The 'z' score statistics are determined using robust standard errors and are reported in brackets

ii. '', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Table C4 - Model 6 using change in lagged performance measures as regressors.

$\%\Delta CEO\ Total\ Comp_{it} = \alpha_t + \beta_1 \Delta Performance_{it-1} + \beta_2 \%\Delta Economic\ Controls_{it} + \beta_3 Governance\ Controls_{it} + \beta_4 \%\Delta Governance\ Controls_{it} + \beta_5 Utilities\ (GICS\ Sector)\ Dummy_{it} + \beta_6 VIC\ (State)\ Dummy_{it}$

Dependent Variable %ΔCEO Total Comp	Predicted Sign	ΔROA$_{it-1}$ *(Col 1)*	ΔProfit Margin$_{it-1}$ *(Col 2)*	ΔAsset Turnover$_{it-1}$ *(Col 3)*	ΔProfit Margin$_{it-1}$ + ΔAsset T/O$_{it-1}$ *(Col 4)*
ΔROA%$_{it-1}$	+	0.357			
		(1.257)			
ΔProfit Margin %$_{it-1}$	+		0.026		0.026
			(0.733)		*(0.743)*
ΔAsset Turnover$_{it-1}$	+			-0.024	-0.029
				(-0.619)	*(-0.695)*
%ΔTotal_Revenue$_{it}$	+	0.027	0.028	0.020	0.028
		(1.211)	*(0.980)*	*(1.017)*	*(0.984)*
Net Loss Dummy$_{it}$	-	0.003	0.003	0.000	0.003
		(0.081)	*(0.064)*	*(0.001)*	*(0.060)*
Board Size$_{it}$	+	0.009	0.008	0.007	0.008
		(1.167)	*(1.104)*	*(1.092)*	*(1.099)*
% Indep Directors$_{it}$	+	0.190**	0.195**	0.192**	0.197**
		(2.369)	*(2.269)*	*(2.292)*	*(2.271)*
Gov_Grants_Dummy$_{it}$	+	0.013	0.010	0.010	0.010
		(0.668)	*(0.442)*	*(0.425)*	*(0.462)*
%ΔNet_Board_Comp$_{it}$	+	0.010	0.009	0.007	0.009
		(0.167)	*(0.156)*	*(0.117)*	*(0.156)*
Regulated Price Dummy$_{it}$	-	-0.010	-0.013	-0.013	-0.013
		(-0.202)	*(-0.272)*	*(-0.266)*	*(-0.275)*
Utilities (GICS Sector)$_{it}$	+	0.003	0.006	0.004	0.005
		(0.051)	*(0.086)*	*(0.055)*	*(0.075)*
VIC$_{it}$	+	-0.056*	-0.056*	-0.053	-0.054
		(-1.696)	*(-1.667)*	*(-1.594)*	*(-1.596)*
CSO_Dummy$_{it}$	-	0.009	0.011	0.010	0.010
		(0.180)	*(0.239)*	*(0.213)*	*(0.208)*
Constant	+	-0.142	-0.138	-0.130	-0.137
		(-1.475)	*(-1.347)*	*(-1.351)*	*(-1.346)*
R^2 *(Overall)*		0.067	0.043	0.039	0.044
Wald chi^2		23.22**	26.65**	23.88**	26.75**
Number of Observations		232	232	232	232
Random Effects		√	√	√	√

Note:

i. *The 'z' score statistics are determined using robust standard errors and are reported in brackets*
ii. *'*', '**', '***' indicate two tailed statistical significance at the 10, 5 and 1 per cent levels.*

Chapter 4

Conclusions

Within the Australian public sector, both universities and GBEs are economically, politically and socially significant. Universities are publicly owned institutions that receive extensive government funding as well as being the third largest export revenue generator for the Australian economy. In fact, government funding and international student revenues represents approximately 60% and 17% respectively of total university revenues.[144] State and Commonwealth owned GBEs provide critical infrastructure and services to the community and make a significant contribution to Australian GDP. Both universities and GBEs, over the last three decades have gone through significant regulatory changes in order to enhance the efficiency and effectiveness of their operations. These changes were aimed at transforming traditional public sector bureaucratic structures via the adoption of corporate sector operating and governance structures. This has led to, amongst other things, explicit and implicit performance requirements for these entities and the deregulation of compensation paid to university VCs and CEOs of GBEs. Consistent with trends in the corporate sector, the high levels of and abnormal[145] growth in both VC and CEO compensation has attracted significant levels of media attention (Dodd 2014; Sibillin 2011). Given this changing environment in public sector practice, this thesis provides evidence on the pay performance relation of VCs of Australian universities and CEOs of GBEs.

The statistical tests used to test the pay / performance relation of VCs of Australian universities used rankings as the performance measure. Based on a number of empirical tests, this study does not find any association between VC compensation and university performance. The only consistently significant explanatory variable associated with the

[144] Australian Government, Department of Education Employment and Workplace Relations, Financial Reports of Higher Education Providers, (HEPS) 2005 - 2014.
[145] The growth in VC and CEO compensation is more than double the growth of academic and average employee earnings in Australia.

levels of and growth in VC compensation is university size. The results are consistent with respect to a number of alternative econometric specifications, including alternative size measures, alternative ranking performance measures and the consideration of institutional classifications and governance characteristics.

To provide evidence on the association between CEOs' compensation and GBEs' performance, I have hand collected accounting based performance measures from the annual reports of GBEs. Based on a number of empirical tests, I do not find a strong association between CEO compensation and performance using financial performance measures. Consistent with the findings reported in Chapter 2, the main significant explanatory variable associated with the levels and growth in CEO compensation is size. In addition, a reasonably strong association is also found between CEO compensation and the levels and growth in Board Compensation of GBEs. The results are consistent with respect to a number of alternative econometric specifications, including alternative size measures, alternative performance measures, governance and institutional characteristics.

Limitations

Whilst the evidence in this thesis is the first of its type, it is limited due to a lack of disclosure and consistency of information presented in the annual reports of universities and GBEs. In many instances the annual audited reports did not comply with the disclosure requirements of the relevant accounting standards being AASB124[146] and AASB1046[147]. Further, despite the non-conformance with these standards, there was no qualification issued in the Audit Report of those institutions that did not comply with the

[146] Australian Accounting Standards Board - AASB124 - Related Party Transactions
[147] Australian Accounting Standards Board - AASB 1046 - Director and Executive Disclosures by Disclosing Entities - January 2004

requirements of these standards. This situation was evident in both, the university and the GBE sectors.

Some Possible Policy Implications

For the university sector (Chapter 2), given that I have found no association between externally observable performance metrics and the compensation of VCs, there are at least two plausible explanations (i) the inefficiency of the governance systems of universities and (ii) the absence of disclosures detailing specific quantifiable performance targets and their achievement. With respect to governance, at present university councils are generally large and have members comprising political appointments, non-expert staff and student representatives. Such representatives typically lack the skill and expertise required to provide effective monitoring of the Vice-Chancellor. With respect to the non-disclosure of performance metrics, if this practice was reversed with the inclusion of performance targets and their achievements, not only would it enhance transparency but would also enhance and provide justification for the pay / performance relation. Accordingly, the council could set independent, externally verifiable quantifiable performance targets not limited to but including (i) unadjusted entry scores for students, (ii) the raw demand for courses by way of acceptance of first round offers (iii) attrition rates by comparing completion rates to original enrolments (iv) employability of graduates post completion, and (v) VCs' ability to raise funding via philanthropy. If these explicit externally verifiable performance targets and measures were disclosed, perhaps it would be possible to get a better pay / performance alignment.

For the GBE sector, performance measures are embedded in legislation. Given that I could not find an association supporting the pay / performance relation, at least in part, may be attributed to corporate governance failures. These failures may be attributed to a

lack of explicit reporting of key quantifiable performance targets that CEOs need to meet or the weaknesses or inexperience of the board, which cannot hire and contract with CEOs to achieve an independently verifiable pay / performance relation. The fact that the shareholder Government minister(s) can override any decision made by the board alleviates board responsibilities and may have flow-on implications. Further, as the evidence indicates a strong association between the levels of and growth in board compensation with CEO compensation, this situation should necessitate application of governance standards that specify disclosures with respect to performance targets and their achievements as the basis for both CEO and Board compensation.

Key policy implications which governments may want to consider, based on the lack of evidence supporting the pay / performance relation of VCs and CEOs, relate to disclosures and governance. Disclosures could incorporate performance measures that are independently verifiable and provide transparency in support of good governance. Better disclosure with respect to performance targets and their achievement would enable this relationship to be tested more explicitly.

Future Research

Future research could be based on surveys of VCs of universities and CEOs of GBEs where feedback is provided on both internal and external performance benchmarks that would facilitate the re-examination of this relationship. Future research may also focus on investigating the quality of financial reporting and the disclosures contained therein where the specific performance targets could be identified or matched with their quantifiable, independently verifiable achievements. Further, the survey could specifically identify the detailed components of VC and CEO compensation based on the disclosure requirements applicable to publicly listed companies. Unless there exist

regulatory exemptions for university and GBE disclosures, there is no reason why public entities should not be subject to the provisions of Accounting Standards as specified in the legislation. Finally, an examination of the governance characteristics of both GBE and university boards and councils with respect to method of appointment, qualifications, responsibility, authority and accountability could also provide areas of interest for future research.

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