

CHAPTER 5

THE MARKET FOR VICE-CHANCELLORS

1.1 Introduction

The market for Vice-Chancellors in Australia is explored firstly by looking at the characteristics of Vice-Chancellors themselves. Secondly, we look at appointment and turnover in the Australian market for Vice-Chancellors before modelling Vice-Chancellor remuneration by estimating an earnings function using institutional, geographical and personal characteristics. Finally, comparisons are made between Vice-Chancellors in Australia and their international counterparts and also between Vice-Chancellors and their corporate counterparts, Chief Executive Officers (CEOs).

1.2 Demographics of Vice-Chancellors

This section provides a “demographic profile” of Vice-Chancellors. By examining their education, age at appointment and length of tenure, we show that a fairly well-defined picture of the typical Vice-Chancellor emerges.

Table 1.1 shows the educational backgrounds of Vice-Chancellors by broad field of education¹ and compares them to the proportion of award course completions as reported by the Department of Education, Science and Training (DEST) for the period 1993-2002. Details on the educational background of Vice-Chancellors were obtained from *Who's Who in Australia*, biographies provided by University Vice-Chancelleries and also from the Australian Vice-Chancellors' Committee (AVCC).² Figure 1.1 shows the under or over-representation of Vice-Chancellors by background relative to the proportion of award completions. The further the deviation from the 45 degree line, the greater the over or under-representation. Points to the right of the 45 degree line (Society and Culture, Natural and Physical Sciences) show an over-representation while those to the left of the 45 degree line show an under-representation of Vice-Chancellors relative to the proportion of award completions.

¹ The Field of Education classification is used to describe higher education courses, specialisations and units of study and is a component of the Australian Standard Classification of Education (ASCED). This classification has been developed to be used nationally in all administrative and survey collections which incorporate data on education by field (Department of Education, Science and Training, 2004c).

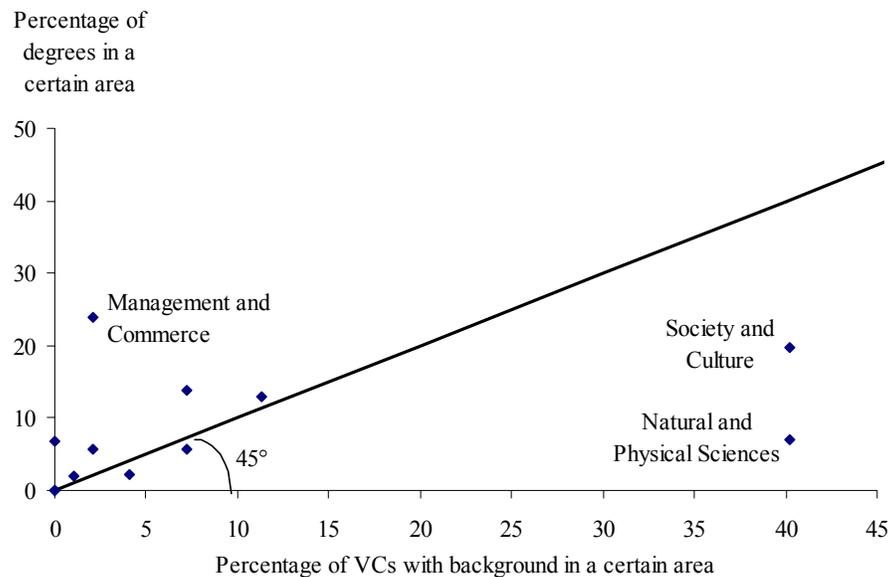
² The data provided by the AVCC contained considerable errors and gaps; when cross-checked, approximately 87 percent (84 of 97) of the listed disciplines were incorrect.

Table 1.1
 BACKGROUNDS OF VICE-CHANCELLORS

| Broad Field of Education | Award Completions | Vice-Chancellors (percentages) |
|--|-------------------|-----------------------------------|
| Natural and Physical Sciences | 7.08 | 40.21 |
| Information Technology | 6.85 | .00 |
| Engineering and Related Technologies | 5.67 | 7.22 |
| Architecture and Building | 2.02 | 1.03 |
| Agriculture, Environmental and Related Studies | 2.18 | 4.12 |
| Health | 12.99 | 11.34 |
| Education | 13.76 | 7.22 |
| Management and Commerce | 24.00 | 2.06 |
| Society and Culture | 19.78 | 40.21 |
| Creative Arts | 5.63 | 2.06 |
| Food, Hospitality and Personal Services | .02 | .00 |
| Mixed Field Programmes | .01 | .00 |

Source: Department of Education, Science and Training (2004c), *Who's Who in Australia*, AVCC, University Vice-Chancelleries.

Figure 1.1
 OVER/UNDER REPRESENTATION OF VICE-CHANCELLORS
 BY BACKGROUND



Source: *Who's Who in Australia*, AVCC, University Vice-Chancelleries.

From Table 1.1, Vice-Chancellors with a background in natural and physical sciences or society and culture are over-represented relative to the proportion of award completions in those fields. The disparity is most stark for the pure sciences, with the

difference being more than fivefold, while for social sciences the difference is twofold. Vice-Chancellors from these backgrounds interviewed believed that their background helped them in the role by teaching them pragmatism. In addition, science was thought to be of benefit to academic administration through its focus on solutions and answers, teaching investigative skills, gathering data, analysing it, coming to conclusions and the associated implications as well as the ability to manage complex concepts. There is an under-representation of Vice-Chancellors with backgrounds in information technology (none) and management and commerce (a twelve-fold difference) relative to the number of award completions. This is somewhat surprising, given that the role of Vice-Chancellor is one of management and due to the corporatisation of universities, requires commercial expertise. During the course of interviews with Vice-Chancellors, it was observed that these individuals identified a need to understand and be comfortable with using and interpreting financial statements and data. The lack of Vice-Chancellors with information technology backgrounds may reflect the relatively recent emergence of this field of study compared to the age at which most Vice-Chancellors are appointed (discussed below). These results may also reflect the opportunity cost of postgraduate study relative to the earnings potential foregone, given that Vice-Chancellors tend to have some form of postgraduate qualification (most commonly a PhD). However, it is interesting to note that the results presented are not inconsistent with those found by Siegfried (1997), where US presidents with an economics background (social sciences) are over-represented relative to the number of undergraduate degrees awarded and has been increasing over time. He suggests that this may be due to the perception that those individuals with economics backgrounds are more likely to realise the constraints on resources.

Fisher et al. (1988) find that those with social science backgrounds are rated by other presidents as being more effective. During the course of interviews with Vice-Chancellors, one question asked was who they considered to be an effective Vice-Chancellor. Table 1.2 shows the backgrounds of those Vice-Chancellors considered effective by their peers. Note that the analysis suffers from small sample size (four Vice-Chancellors) constraints; however it is still interesting to note that those with backgrounds in society and culture feature strongly.

Table 1.2

BACKGROUNDS OF EFFECTIVE VICE-CHANCELLORS

| Broad Field of Education | Proportion considered effective (%) |
|--------------------------------------|-------------------------------------|
| Engineering and Related Technologies | 10 |
| Health | 30 |
| Education | 10 |
| Society and Culture | 50 |

Source: Personal Interviews.

Panel A of Table 1.3 shows the location of the educational institution where Vice-Chancellors received their Bachelor and postgraduate qualification. Panels B and C split this into internally versus externally appointed Vice-Chancellors while Panel D looks at the location of the postgraduate institution conditional on the location of the Bachelor institution. The table is to be read in a “columnwise” manner; thus, looking at Panel A, for example, we see that 64 percent of Vice-Chancellors have Bachelor degrees from an Australian university, while the remaining 36 percent obtained their Bachelor degrees from a foreign institution. Breaking this down into internal versus external appointments, a higher proportion of internal appointments tend to have a domestic Bachelors qualification; when looking at the location of their postgraduate institution, regardless of whether the candidate is an internal or external appointee, the situation does not differ substantially between the two and is similar to that of all Vice-Chancellors as a collective group. Panel D shows that Vice-Chancellors who received a domestic Bachelors qualification are roughly evenly split between choosing to stay in Australia versus going overseas for their postgraduate qualification. However, those Vice-Chancellors who have a foreign Bachelors qualification are three times as likely to also obtain their postgraduate qualification from a foreign institution as an Australian institution. Perhaps these individuals are imported into Australia for their careers in Australian universities.

Most Vice-Chancellors in Australia are appointed in their 50s. Panel A of Figure 1.2 shows the age distribution of Vice-Chancellors when appointed. Approximately 88 percent of Vice-Chancellors take on the role by age 60 while only about 15 percent have assumed the role by age 50. This is an important consideration for the motivation of potential candidates who aspire to the role of Vice-Chancellor.

Table 1.3
EDUCATIONAL QUALIFICATIONS OF VICE-CHANCELLORS

| Location | Bachelor | Postgraduate |
|--|----------|--------------|
| (Percentages) | | |
| A. <u>All Vice-Chancellors</u> | | |
| Domestic | 63.8 | 39.4 |
| Foreign | 36.2 | 60.6 |
| Total | 100.0 | 100.0 |
| B. <u>Internal Appointments</u> | | |
| Domestic | 75.9 | 41.4 |
| Foreign | 24.1 | 58.6 |
| Total | 100.0 | 100.0 |
| C. <u>External appointments</u> | | |
| Domestic | 56.7 | 37.3 |
| Foreign | 43.3 | 62.7 |
| Total | 100.0 | 100.0 |
| D. <u>Postgraduate Institution Conditional on Location of Bachelors Institution</u> | | |
| | Domestic | Foreign |
| Postgraduate | | |
| Domestic | 48.3 | 23.5 |
| Foreign | 51.7 | 76.5 |
| Total | 100.0 | 100.0 |

Source: *Who's Who in Australia*, AVCC, University Vice-Chancelleries.

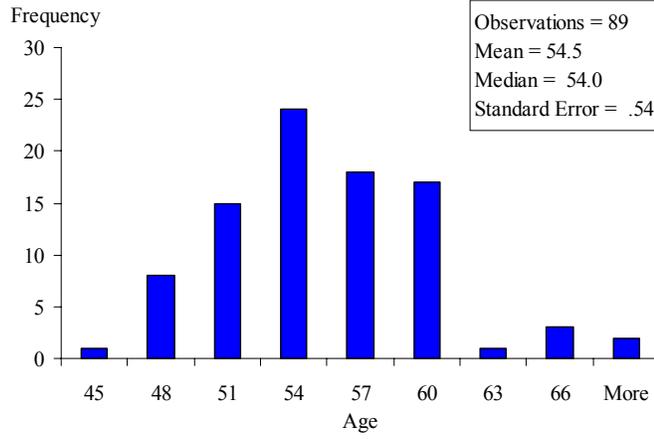
Panel B of Figure 1.2 splits the age distribution to investigate whether there is a difference between the ages of internally versus externally appointed Vice-Chancellors. The mean age of internally appointed Vice-Chancellors is 55.0 years versus externals at 54.3 years. However, the difference in mean age is not significant at conventional levels.³ It appears that the process of Vice-Chancellor appointment in Australian institutions is not consistent with the learning hypothesis, where internals are appointed at a younger age relative to externals, as the institution is better able to assess the capabilities of the candidate and therefore has a greater information set regarding the managerial expertise of the individual.

³ One-tailed t-statistic is .55 (p-value .29).

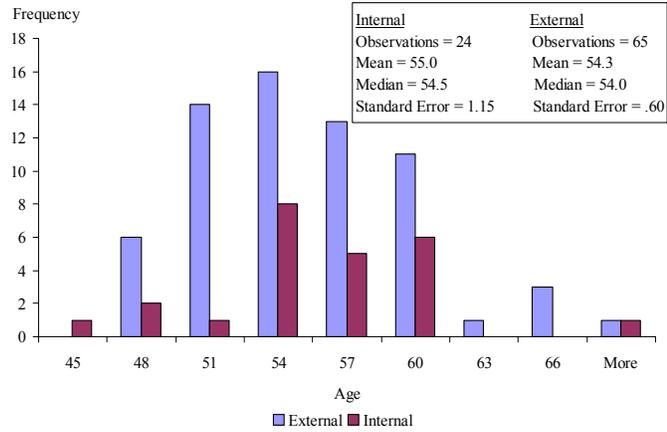
Figure 1.2

AGE DISTRIBUTION, TENURE AND TURNOVER FOR VICE-CHANCELLORS

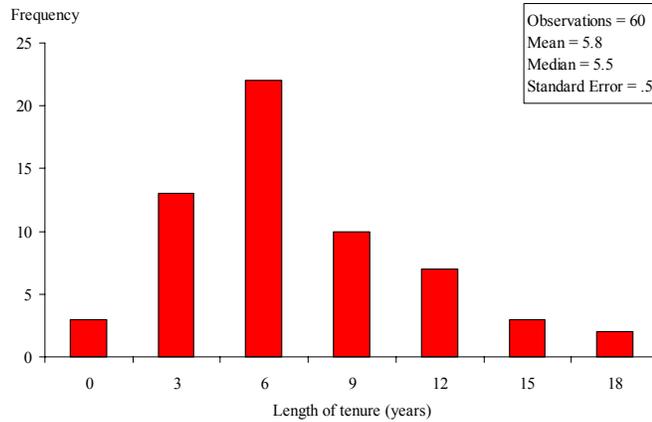
A. Appointment



B. Internals versus Externals



C. Tenure

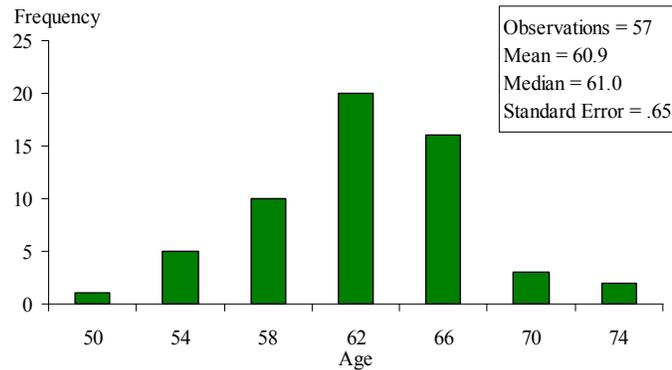


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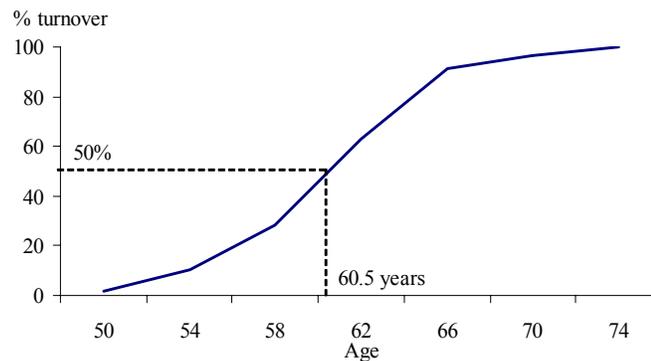
Figure 1.2

AGE DISTRIBUTION, TENURE AND TURNOVER FOR VICE-CHANCELLORS (continued)

D. Turnover



E. Cumulative Distribution of Vice-Chancellor Turnover



Source: *Who's Who in Australia*, AVCC, University Vice-Chancelleries.

Vice-Chancellors spend approximately six years in the post, on average, before turnover. Their length of tenure seems to be dependent on the age of appointment, with Vice-Chancellors appointed at an earlier age having longer tenure, as shown in Figure 1.4.⁴ For every later year in age that a Vice-Chancellor is appointed, the average tenure falls by approximately .4 years or between four and five months. For example, consider a person aged 50 who commences as a Vice-Chancellor. Then, according to the estimated regression equation of Figure 1.4 his/her expected tenure in the job is $-.40 \times 50 + 27.81 \approx 7.8$ years. The mean tenure of Vice-Chancellors is 5.8 years (panel C, Figure 1.2). Linking tenure with turnover, the average age of Vice-Chancellor turnover in Australia is 61. This follows intuitively; if the average age of appointment is 55 years (from Panel A of Figure 1.2) and given the average tenure is 6 years (Panel

⁴ Given age c that a Vice-Chancellor in Figure 1.4 is appointed to the position, the average tenure of all Vice-Chancellors appointed at each age c is taken and plotted against c , the age of appointment.

C, Figure 1.2) then the average age of turnover is $55 + 6 \approx 61$ (panel D, Figure 1.2). This “hypothetical” relationship is shown in Figure 1.3. Comparing Figure 1.3 with Figure 1.4, while there is a negative relationship between age and tenure, in Figure 1.3 the relationship is that for every additional year that a Vice-Chancellor is appointed after 55, average tenure falls on average by 1 year. The relationship is more general in Figure 1.4, where for each additional year in age that a Vice-Chancellor is appointed, average tenure falls by .4 years. The different slopes can be reconciled due to the narrow range of ages over which Figure 1.3 relates to, relative to Figure 1.4. The absolute value of the slope of Figure 1.3 is higher than that of Figure 1.4 due to the shorter tenure of older Vice-Chancellors and higher turnover once past the age of 60.

Most turnovers occur after the age of 60; only 39 percent of Vice-Chancellors have left their post by age 60 and as shown in Panel E of Figure 1.2, half of all Vice-Chancellors are turned over by age 61. Once past sixty, there is a small window during which the majority of Vice-Chancellors leave their role; 63 percent of Vice-Chancellors have left by age 62. This reflects the relatively late age at which Vice-Chancellors are appointed. Panel D of Figure 1.2 shows the age distribution of Vice-Chancellor turnover, while Panel E shows the cumulative distribution.

Figure 1.3
 “HYPOTHETICAL” RELATIONSHIP BETWEEN APPOINTMENT AND TENURE

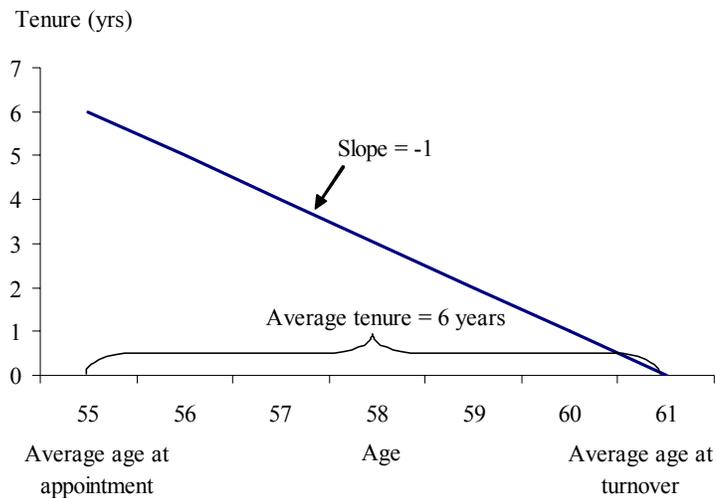
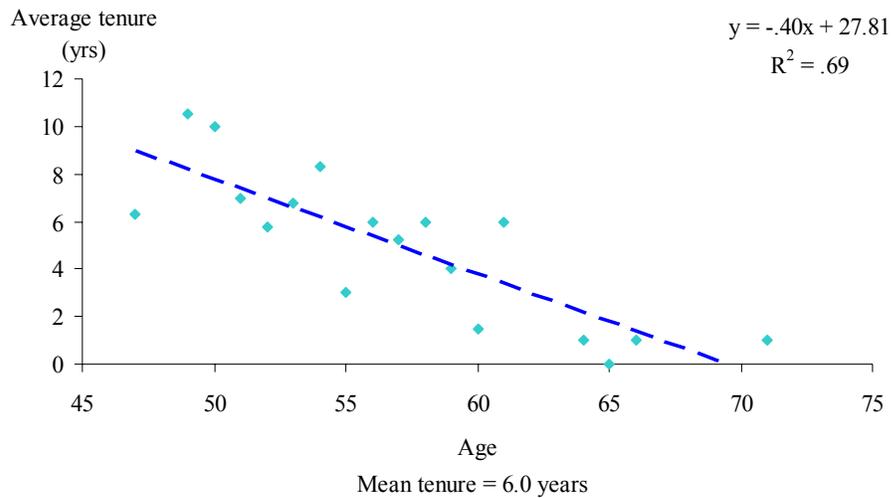


Figure 1.4

TENURE ACROSS AGE OF VICE-CHANCELLOR APPOINTMENT



Source: *Who's Who in Australia*, AVCC, University Vice-Chancelleries.

1.3 Turnover, Tenure and Appointment

We now investigate the determinants of turnover, tenure and appointment of Vice-Chancellors. There has been some recent activity in this market, with the most recent turnover in late August 2004, when the Vice-Chancellor of RMIT, Professor Ruth Dunkin, resigned from her post. The length of her tenure was four years. The most recent appointment (not surprisingly) has been that of her successor, Professor Chris Whitaker.

What are the determinants of Vice-Chancellor tenure? This is modelled drawing on the work of Murphy and Zimmerman (1993) and Murphy (1999). For Vice-Chancellor turnover at institution i at time t the model estimated is shown in equation (5.1):

$$\log T_{it} = \alpha + \beta t + \gamma \text{Age}_{it} + \delta \text{Earnings}_{it} + \lambda \text{Retire}_{it} + \varepsilon_{it} \quad (1.1)$$

where T is the time spent in office as Vice-Chancellor; t is a time trend, so that β will indicate the trend in the length of time spent in office; Age is the age of the Vice-Chancellor at year end; Earnings is the operating result (in thousands); Retire a dummy variable equal to one if the Vice-Chancellor is aged 65 or over and ε an error term. Note the use of the log-linear functional form in equation (1.1). This has the

attraction of transforming the strictly positive variable, T , into one which has an unrestricted domain, $\log T$. This is desirable as $\log T$ is more likely to be normally distributed (a range of $-\infty$ to $+\infty$) than T . The coefficient β shows how the average length of tenure is changing over time, which may reflect changes in the demands placed on the role of Vice-Chancellor. To control for the effects of inflation, earnings are expressed in constant 1996 dollars. The data is available in Appendix A3. The results are shown in Table 1.4.

Table 1.4
VICE-CHANCELLOR TENURE

$$\log T_{it} = \alpha + \beta t + \gamma \text{Age}_{it} + \delta \text{Earnings}_{it} + \lambda \text{Retire}_{it} + \varepsilon_{it}$$

(standard errors in parentheses)

| Variable | | Value |
|-------------------------------|-----------|------------------|
| Intercept | α | -174.67 (105.01) |
| Time | β | .09 (.05) |
| Age | γ | -.07 (.04) |
| Earnings ($\times 10^{-5}$) | δ | .85 (.77) |
| Retire | λ | .45 (.40) |
| \bar{R}^2 | | .05 |
| df | | 27 |

From Table 1.4 it appears that the average length of tenure appears to be increasing, although the effect is only weakly significant. An increase in each year of calendar time leads to an increase in the length of average tenure of 9 percent. Age is also weakly significant, with older Vice-Chancellors spending a shorter time in the role, although the effect is small in magnitude; with an additional year in age leading to a 7 percent decrease in the length of tenure. From Panel C of Figure 1.2, the mean length of tenure is 5.8 years and an additional year in Vice-Chancellor age decreases average tenure by between four to five months.⁵ The negative relationship between age at appointment and tenure is consistent with Figure 1.3 and Figure 1.4. The coefficient on the Retire dummy variable is positive but not significant, suggesting that Vice-Chancellors who are at retirement age or older do not have significantly longer tenures, consistent with the finding in panels D and E of Figure 1.2 that most Vice-Chancellors are turned over prior to reaching retirement age. However, the model does not seem to be a good fit for the data, as suggested by the low adjusted R^2 . Murphy (1999) in

⁵ Evaluated at the mean, the length of tenure decreases to 5.4 years, which translates to a decrease of between four to five months.

looking at turnover of S&P 500 Industrials CEOs over the period 1970-1995 finds that CEOs who are at or older than retirement age are more likely to be turned over. Perhaps surprisingly, earnings do not appear to be significant, which suggests that there is little evidence of a link between the financial performance of an institution and the length of time spent in office. Murphy (1999) finds that for US CEOs, there is a negative relationship between performance (measured by industry return) and turnover, with poorly performing CEOs more likely to be turned over, although the economic significance of the relation is small.

To look at the process through which Vice-Chancellors are appointed, a logit model similar to that used by Agrawal et al. (2003) is used to investigate whether there is any evidence suggesting that outsiders are handicapped in the appointment process relative to insiders, consistent with tournament theory. In brief, tournament theory provides incentives to expend effort and perform as contestants compete to win a contest (in this case, the “prize” is appointment to the role of Vice-Chancellor) with the winner determined by the relative rank of contestants. The theory predicts that external contestants will be handicapped relative to internals to provide incentives for internals to increase their productivity over their entire working life (Chan, 1996).⁶ The model used is shown in equation (5.2):

$$OUT_{it} = \alpha + \beta Staff_{it} + \gamma Earnings_{it} + \delta VC_{it} + \lambda \log(Assets)_{it} + \theta Go8_{it} + \varepsilon_{it} \quad (1.2)$$

where for institution i at year t , $OUT = 1$ if the Vice-Chancellor is an external appointment and zero otherwise; $Staff$ is the number of full-time equivalent staff at the university; $Earnings$ is the operating result (in thousands); $VC = 1$ if the outgoing Vice-Chancellor was an external appointment and zero otherwise; $Asset$ a measure of size measured by total assets (in thousands); $Go8$ a dummy variable equal to one if the institution is a member of the Group of Eight and zero otherwise; and ε is an error term. To control for inflation, dollar values of earnings and total assets are expressed in constant 1996 dollars. The natural log of total assets is also used; earnings are not transformed in the same way as some observations are negative. The number of full-time equivalent staff is included as Nalebuff and Stiglitz (1983) find that contest structures are preferred to piecemeal rates where there are larger numbers of contestants.

⁶ For further details on tournament theory, see the literature review in Chapter 2.

Whether or not the outgoing Vice-Chancellor was an internal or external appointment and the Group of Eight dummies are included to pick up tradition/cultural effects of institutions, that is, to investigate if there are tendencies among institutions to appoint internals or externals. However, the sample period looked at may not be wide enough to pick up these cultural effects as most universities had zero or one turnover during this period. Note that a variable to capture whether or not the outgoing Vice-Chancellor resigned or was forced to leave the post is not included due to the lack of dispersion in this variable. The regression data is available in Appendix A3. The results are shown in Table 1.5.

Table 1.5

DETERMINANTS OF VICE-CHANCELLOR APPOINTMENT

$$OUT_{it} = \alpha + \beta Staff_{it} + \gamma Earnings_{it} + \delta VC_{it} + \lambda \log(Assets)_{it} + \theta Go8_{it} + \varepsilon_{it}$$

(Dependent variable = 1 if appointee is an outsider; standard errors in parentheses)

| Variable | Value | P-value | Probability | χ^2 | n |
|----------------------------|---------------|---------|-------------|----------|----|
| Intercept | 10.09 (15.69) | .52 | 1.00 | | |
| Staff ($\times 10^{-2}$) | .00 (.10) | .85 | .50 | | |
| Earnings | .00 (.00) | .61 | .50 | | |
| VC | .13 (.99) | .90 | .53 | | |
| $\log(Assets)$ | -.75 (1.29) | .56 | .32 | | |
| Go8 | 1.84 (1.54) | .23 | .86 | 2.62 | 31 |

From Table 1.5, it appears that there is little evidence suggesting that the process of Vice-Chancellor appointment in Australian universities follows a tournament theory-like process, where outsiders are handicapped relative to insiders. The coefficient on VC is not significant, meaning that institutions where the former Vice-Chancellor was an external appointment are not significantly more likely to appoint another external over an internal. If we take the positive value of the coefficient at face value, when converted to a probability, the appointment of an outsider this time around is more likely if an outsider was previously appointed, suggesting that there is a culture effect present in institutions, although the effect is not significant. Tournament theory would suggest that the more staff at an institution, the greater the potential pool of internal applicants from which to draw upon and the greater the handicap to outsiders. This may provide motivation for internals to expend more effort, benefiting the institution as a whole. However, the coefficient of the Staff variable is small in magnitude and when converted to a probability, institutions with more staff are equally as likely to appoint an external or internal Vice-Chancellor. There also seems to be no evidence of a Group of

Eight effect, but taken at face value these institutions are, all else equal, more likely to appoint an external over an internal. This may be because the pool of potential Vice-Chancellors for these institutions contains candidates who are more comparable to one another, making it easier for the institution to assess the quality of externals relative to internals.

1.4 Comparing the Vice-Chancellor Experience to that of CEOs

How do Australian Vice-Chancellors compare to Australian CEOs? The two roles are similar in that they are both senior management roles. However, they differ in the structure of remuneration, risk, stress and job satisfaction. CEO remuneration is typically made up of four components: salary, bonus, options and other benefits (Murphy, 1999). Bonuses are typically based on financial measures such as earnings. Options are a form of long term incentive for the CEO. In the case of Vice-Chancellors, options are not feasible due to these institutions not having an identifiable market price and shares. Additionally, bonuses based on financial measures are unlikely to capture the non-financial aspects of institution performance.

The risks faced by CEOs and Vice-Chancellors are closely related to their tenure in the role, although the nature of these risks differ. CEOs face more a more explicit onus to maximise shareholder value while the case for Vice-Chancellors is not so clear. Additionally, while CEOs may be disciplined for poor performance by the market for corporate control or their shareholders, universities have government support and lack clearly defined ownership boundaries between their different stakeholders.

The stresses of the two jobs are similar, with more firms now being concerned about the non-financial aspects of operations and universities more concerned about the financial aspects of their operations, although Vice-Chancellors are often subject to more complex relationships with their stakeholders than CEOs. In addition, Vice-Chancellors must also deal with the importance of maintaining academic credibility, which is not so important to the majority of firms.

Finally, the satisfaction derived from the job is likely to be different between the two roles. It is highly probable that Vice-Chancellors derive greater enjoyment from the non-pecuniary aspects of the role than CEOs, given the public good dimension to universities. This section draws comparisons predominantly from Lieu (2003) but also

from other sources to analyse the differences and similarities between the market for Vice-Chancellors and the market for CEOs in Australia.

Looking at academic qualifications, 83 percent of CEOs have some sort of academic qualification, compared to 100 percent of Vice-Chancellors. Only 6 percent of Australian CEOs hold some sort of post-graduate qualification as opposed to the entire sample of Vice-Chancellors. This may reflect the importance of academic credibility in universities relative to corporations.

Looking at appointment, CEOs are appointed at younger ages than Vice-Chancellors. Over 90 percent of CEOs assume the position by age 55, with the majority of appointments occurring between the ages of 41 to 55. In contrast, the mean age of Vice-Chancellor appointment is just under 55 years. The older age at which Vice-Chancellors tend to be appointed may reflect the importance of seniority in promotion in academia relative to the private sector. However, average tenure is dependent on the age of appointment for both Vice-Chancellors and CEOs, with the sensitivity being similar for both CEOs and Vice-Chancellors. For both groups of top management, for each additional year's increase in age that the individual is appointed to the post, the average tenure declines by .4 years.⁷ Panel A of Figure 1.5 shows the age distribution for CEO appointment while Panel B shows tenure across age of appointment.

In terms of tenure and turnover, a study looking at CEO turnover for ASX 200 companies in 2002⁸ found that the average tenure for CEOs leaving office is 4.4 years. While this is almost half of the global average of 8.6 years (Booz Allen Hamilton and Business Council of Australia, 2003), it is similar to the mean tenure of Vice-Chancellors of 5.8 years shown in panel C of Figure 1.2. The shorter tenure may indicate that in Australia, top management are under greater pressure to perform and those in the private sector who fail to do so are disciplined by the market for corporate control.⁹ However, Lieu finds that average tenure of all CEOs is 5.8 years, the same as that for Vice-Chancellors. The age distribution of CEOs leaving their post also shows that turnover occurs at younger ages for CEOs relative to Vice-Chancellors, with most CEOs leaving between the ages of 51 to 60 years. More than 85 percent of CEOs are

⁷ For CEOs, this holds only for those appointed after the age of 31.

⁸ The sample includes 178 companies from the top ASX 200, of which 22 organisations experienced CEO turnover in 2002.

⁹ CEOs seen as not meeting Board expectations have an average tenure of 3.6 years (Business Council of Australia, 2004). CEO turnover in Australia was found to be disproportionately driven by merger activity, accounting for 21 percent of all turnover, versus 14 percent globally.

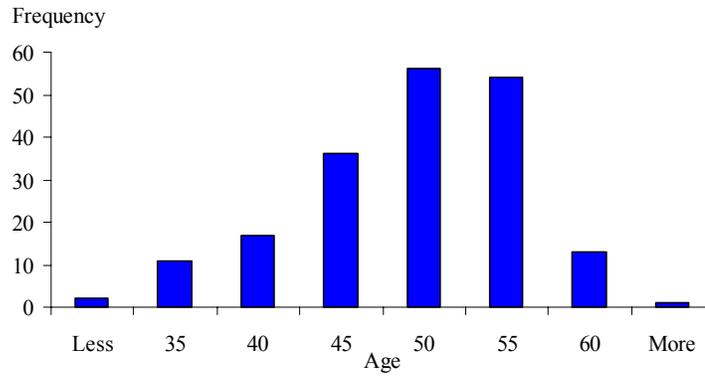
replaced by age 60, while the mean age of turnover for Vice-Chancellors is 61. The age distribution of CEO turnover is shown in Panel C of Figure 1.5.

Looking at turnover, Lieu finds that there is an association between CEO turnover and profitability, with CEOs more likely to be replaced following a fall in net profit of approximately \$85 million or more. For Vice-Chancellors, while there is a positive association between earnings and tenure, the relationship is not significant (see Table 1.4). While there appears to be evidence that Australian firms discipline management for poor performance, the case for Vice-Chancellors is different, which may reflect the different bases (both financial and non-financial) on which Vice-Chancellor performance is evaluated relative to CEOs. Looking at the incidence of turnovers, Lieu's data finds that for CEOs, the number of turnovers per institution per year is .15, while that for Vice-Chancellors is .14. This shows that the incidence of turnover is similar between the two roles, suggesting that the degree of job-related stress and risk is similar for Vice-Chancellors and CEOs, although it is possible that the statistic is distorted somewhat for Vice-Chancellors due to the appointment of interim or short-term Vice-Chancellors at some institutions while the search for a longer-term appointee takes place.

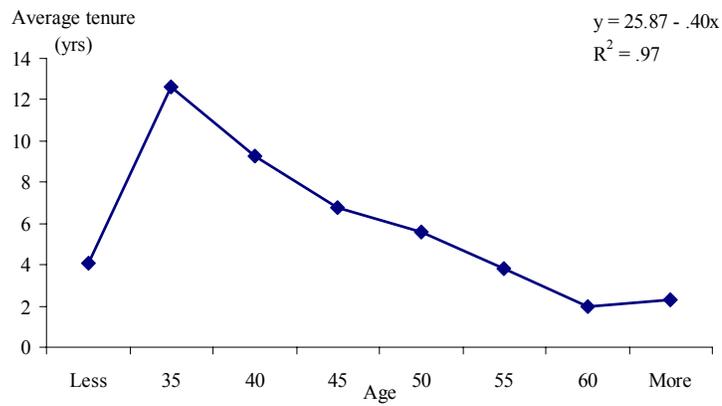
Comparing Vice-Chancellor and CEO appointment, Lieu finds that 61 percent of CEOs in Australian firms are internal appointments while for Vice-Chancellors at Australian universities the majority (68 percent) are external, not internal, appointments. External CEOs tend to be appointed when firms are in crisis, while there appears to be no significant relationship between Vice-Chancellor appointment and institution performance. While Lieu's results support tournament theory, the case for Vice-Chancellors is weak, with institutions with more potential internal candidates (proxied for by the number of full-time equivalent staff) being equally as likely to appoint an internal or external Vice-Chancellor.

Figure 1.5
AGE DISTRIBUTION, TENURE AND TURNOVER FOR CEOs

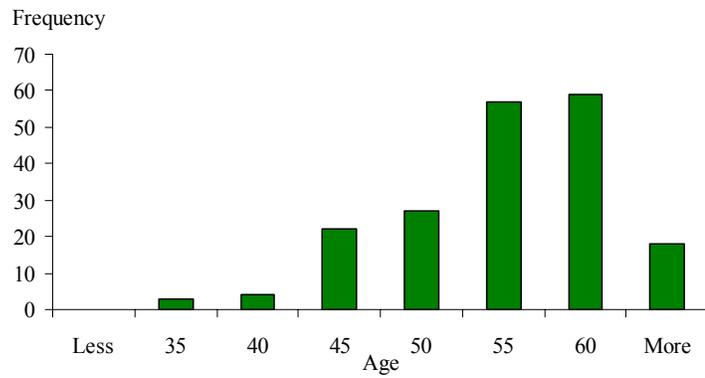
A. Appointment



B. Tenure across Age of Appointment



C. Turnover



Source: Lieu (2003).

Overall, relative to Australian CEOs, Vice-Chancellors are more highly educated, appointed at older ages and do not have shorter tenure. There appears to be little evidence of a link between performance and tenure, nor do earnings have any significant bearing on the decision to appoint an internal versus an external candidate as an incoming Vice-Chancellor. This may reflect differences in demand and supply for top management in the market for Vice-Chancellors versus that of CEOs. On the supply side, the older age of Vice-Chancellor appointment relative to CEOs may reflect the opportunity cost of obtaining postgraduate qualifications. This would also be expected to decrease the supply of potential Vice-Chancellors relative to CEOs, hence it is possible that they would have longer tenures. On the demand side, the costs involved in turning over a new Vice-Chancellor may be higher than that for a CEO, hence there is a weaker link between performance and tenure for Vice-Chancellors than CEOs. Alternative explanations may also include greater difficulty in monitoring and evaluating Vice-Chancellors relative to CEOs or the lack of market forces disciplining Vice-Chancellors for poor performance.

1.5 Modelling Vice-Chancellor Remuneration

What are the factors that determine the remuneration of Vice-Chancellors in Australia? Given that the funding arrangements for universities in the United Kingdom are more similar to the Australian situation than in the United States, the model used is adapted from Baimbridge and Simpson (1996) who model the remuneration of United Kingdom Vice-Chancellors and is shown in equation (5.3):

$$\begin{aligned} \log(\text{Remuneration})_{it} = & \alpha_1 + \alpha_2 \log(\text{Assets})_{it} + \alpha_3 \text{Earnings}_{it} + \alpha_4 \text{ARC}_{it} \\ & + \alpha_5 \log(\text{House})_{it} + \alpha_6 \text{Years}_{it} + \alpha_7 \text{Male}_{it} + \alpha_8 \text{Go8}_{it}, \quad (1.3) \\ & + \alpha_9 \text{Council}_{it} + \alpha_{10} \text{Enrol}_{it} + \alpha_{11} \text{Staff}_{it} + \varepsilon_{it} \end{aligned}$$

where Remuneration_{it} is the compensation of vice-chancellors at institution i at year t ; Assets is total assets (in thousands); Earnings is the operating result (in thousands); ARC the amount allocated to the institution via the Australian Research Council Competitive Grants program (in thousands); and House the median house price in the state or territory where the institution's Vice-Chancellery is located. Let S_r denote region r , $r = 1, \dots, R$. Then if $i \in S_r$, we use house prices in that region for i . The house price data is kindly provided by the Housing Industry Association from the

Commonwealth Bank of Australia and is split into capital cities and the rest of the state. Years is the number of years an individual has occupied the role of Vice-Chancellor, where the first year is taken to be the year the role is assumed; Male a dummy variable that takes the value of one for a male Vice-Chancellor and zero otherwise; Go8 a dummy variable that takes on the value of one if the institution is a member of the Group of Eight universities and zero otherwise; Council the number of members on the university governing council; Enrol the number of student enrolments; Staff the number of equivalent full-time staff and ε a random error term. The model in (1.3) uses the natural logarithm of compensation, total assets and house prices and controls for the effects of inflation by expressing all dollar amounts in terms of constant 1996 dollars. Other dollar denominated amounts (earnings and ARC grant funding) have not been transformed as these amounts may be negative or zero. The data is available in Appendix A3.

The explanatory variables are chosen to reflect institutional factors, personal characteristics and geographical control factors. Of the financial variables, size is proxied for by total assets; earnings is used as a proxy for performance and ARC grant funding is used as a measure of research capacity. Another common proxy for size is revenue; however assets are used in this analysis in preference due to the potential overlap with earnings.¹⁰ Of the non-financial institutional factors, the size of the council proxies for the extent of monitoring in the institution; while enrolments and staff are used in an attempt to capture the expected managerial requirements of the institution. Compared to the corporate setting, they are analogous to the customer base and number of employees in a firm (Baimbridge and Simpson, 1996). The Group of Eight dummy variable proxies for the prestige of the institution. Personal characteristics hypothesised to be relevant in Vice-Chancellor remuneration are gender and the period of time of incumbency of each Vice-Chancellor. In earnings equations employed in labour economics, it is usually argued that experience is a key determinant of earnings. The relationship is typically taken to be quadratic so that earnings initially increase rapidly due to the accumulation of experience in the early years of working life, but then tapers off (see, for example, Mincer (1974)). However, looking at Figure 1.6,¹¹ it seems that there is little evidence of a non-monotonic relationship between the

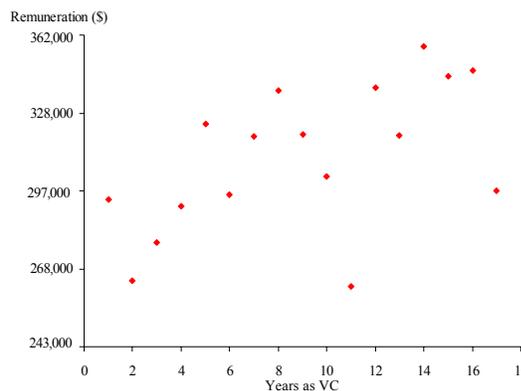
¹⁰ There is a strong correlation between revenue and assets of .91.

¹¹ The average remuneration (in constant 1996 dollars) across institutions for each year of incumbency is taken and plotted against the length of time spent as Vice-Chancellor.

time of incumbency and remuneration (the “truncated quadratic” appears to be monotonic), hence a quadratic period of incumbency term is not included in the model. Finally, to control for geographical cost of living differences, average house prices are used rather than state dummy variables. It is of interest to note that the dispersion of house prices is greater than the dispersion of Vice-Chancellor remuneration.¹² As house prices proxy for state effects, this suggests that while there is greater variation geographically, this is not reflected to the same extent in Vice-Chancellors’ remuneration.

The data for ARC grant funding is sourced from the Australian Research Council (ARC) and DEST. Data from 2001 onward refers to the amount allocated under the Discovery Projects scheme by the ARC. Data prior to 2001 refers to funds allocated under the Large Grants Scheme from statistics held by DEST. Data for the latter is only available from 1998 onward. The ARC advised that data should only be used from 2001 onward as the ARC program components have changed significantly and the data for years prior to 2001 would not be compatible (Hine, 2004). However, due to data availability concerns (excluding data prior to 2001 halves the available observations),¹³ the model is run using data from both sources. The results are shown in column 2 of Table 1.6. The model run using 2001-2002 observations is shown in column 3.¹⁴

Figure 1.6
RELATIONSHIP BETWEEN LENGTH OF TENURE AND REMUNERATION



Source: University Annual Reports, *Who's Who in Australia*, AVCC, University Vice-Chancelleries.

¹² Standard deviation of 31 percent (Remuneration) and 36 percent (house prices).

¹³ The data contains 95 institution years for the sample from 1998-2002 and 48 institution years for the period 2001-2002.

¹⁴ See Appendix A2 for further analysis of the determinants of Vice-Chancellor remuneration.

Table 1.6

DETERMINANTS OF VICE-CHANCELLOR REMUNERATION

$$\log(\text{Remuneration})_{it} = \alpha_1 + \alpha_2 \log(\text{Assets})_{it} + \alpha_3 \text{Earnings}_{it} + \alpha_4 \text{ARC}_{it} \\ + \alpha_5 \log(\text{House})_{it} + \alpha_6 \text{Years}_{it} + \alpha_7 \text{Male}_{it} + \alpha_8 \text{Go8}_{it} \\ + \alpha_9 \text{Council}_{it} + \alpha_{10} \text{Enrol}_{it} + \alpha_{11} \text{Staff}_{it} + \varepsilon_{it}$$

(standard errors in parentheses)

| Variable | 1998-2002 | 2001-2002 |
|------------------------------------|--------------|--------------|
| (1) | (2) | (3) |
| Intercept | 11.01 (1.36) | 10.02 (2.27) |
| $\log(\text{Assets})$ | .14 (.08) | .23 (.14) |
| $\log(\text{House})$ | -.03 (.09) | -.03 (.14) |
| $\text{ARC} (\times 10^{-4})$ | .13 (.08) | -.05 (.14) |
| $\text{Earnings} (\times 10^{-7})$ | .76 (.66) | -.14 (.99) |
| $\text{Council} (\times 10^{-2})$ | .29 (.90) | .22 (1.38) |
| Go8 | .11 (.13) | .48 (.24) |
| Male | -.05 (.07) | -.07 (.14) |
| $\text{Enrol} (\times 10^{-5})$ | .15 (.31) | .06 (.58) |
| $\text{Staff} (\times 10^{-4})$ | -.50 (.62) | -.98 (1.12) |
| Years | .02 (.01) | .02 (.01) |
| \bar{R}^2 | .34 | .25 |
| df | 84 | 37 |

From the second column of Table 1.6, the period of incumbency is significant and the size of the institution, measured by total assets, weakly so. A 10 percent increase in total assets leads to a 1.4 percent increase in Vice-Chancellor remuneration. This is consistent with the private sector model, where CEO remuneration is driven by size (Murphy, 1999). It is also consistent with Leone and van Horn (1999) who find that executive compensation in nonprofits increases by moving from smaller to larger organisations. The marginal effect of an increase in total assets evaluated at the means is .07; in other words, if an institution increases its asset base by one thousand dollars, Vice-Chancellor remuneration increases (on average) by 7 cents.

In contrast to Baimbridge and Simpson (1996), there is a positive relationship between the period of incumbency and remuneration. The relationship is consistent with human capital theory where the longer the period spent in the position, the more experienced and productive is the worker and the higher the reward. In the course of interviews with Vice-Chancellors, it became apparent that Vice-Chancellors believe that institutions have different cultures and managerial requirements. A positive relationship between the length of time as Vice-Chancellor and remuneration is consistent with the

accumulation of valuable institution-specific human capital by the Vice-Chancellor. In this instance, it may be advantageous for an institution to retain this institutional knowledge by encouraging the Vice-Chancellor to stay by offering higher remuneration.

The third column of Table 1.6 controls for the potential incompatibility of data relating to ARC funding by excluding observations prior to 2001. All coefficients have the same sign with the exception of earnings and ARC research funding, which now have a negative but still insignificant impact on remuneration. Institution size and the length of time as Vice-Chancellor are no longer significant at ten percent, however the Group of Eight dummy variable is now significant.

Of particular interest is the finding that there appears to be no regional effect in remuneration setting and that research capacity and student enrolments do not appear to significantly affect remuneration. This suggests that the market for Vice-Chancellors in Australia is national rather than local and while universities strive to improve their research capabilities and student numbers, this does not appear to have an impact on Vice-Chancellor remuneration. If an analogy is drawn to the corporate setting, neither research and development nor the customer base (or the number of employees) appear to be priced factors in top executive remuneration setting. Further, there appears to be no significant relationship between performance (measured by earnings) and compensation. This is in contrast to the corporate situation. Murphy (1999) finds that CEO cash compensation is related to changes in performance (measured by returns), with a pay-performance elasticity of .26 over the period 1990-1996.¹⁵

Ehrenberg et al. (2001) find that the compensation of United States Presidents is positively and significantly related to enrolment (which they use as their size proxy). The Australian experience is slightly more complex. Enrolment is positively but not significantly related to Vice-Chancellor remuneration but there is a positive and weakly significant relationship between size (proxied for by total assets) and remuneration. Ehrenberg et al. also find a positive relationship between compensation and length of tenure, with Presidents receiving an increase of about .8 percent for each additional year in the current position. Sorokina (2003) finds a positive and significant relationship between pay and tenure, with Presidents receiving approximately .4 percent higher pay for each year of tenure. The results for Australian Vice-Chancellors also show a

¹⁵ This means that a one percent increase in returns leads to a .26 percent increase in cash compensation.

positive and significant relationship between remuneration and tenure, although the magnitude of this is larger at approximately 2 percent for each additional year of tenure. This may reflect Australian Vice-Chancellors accumulating institution-specific human capital at a faster rate relative to United States Presidents, making them more valuable to the institution over time.

While both United States studies also find evidence that the type of institution is significantly related to the compensation of Presidents; Ehrenberg et al. find that Presidents of research/doctoral universities receive approximately 13 percent higher compensation than their counterparts at other institution types, holding other variables constant. Sorokina finds that first tier college Presidents receive on average about 9 percent more than those at third tier colleges.¹⁶ The Australian experience does not yield a similar result, with the coefficient on the Group of Eight dummy being positive but not significant for the entire sample period, although for the most recent period the variable is significant, indicating that Vice-Chancellors at these institutions receive on average 62 percent¹⁷ higher remuneration than non-Group of Eight Vice-Chancellors. Perhaps institution quality is becoming a more important consideration for Australian universities over time as they attempt to differentiate themselves and as a result, universities find that they have to pay more to signal this quality and attract better Vice-Chancellors.

Sorokina also finds that female Presidents are paid more than their male counterparts, with an average gender differential of 8 percent. The Australian experience shows that while the coefficient on the male dummy variable is negative, it is not significant, hence there do not appear to be appreciable differences in remuneration between the genders in Australian institutions. This suggests that the labour market characteristics correlated with gender are not appreciably different in Australia. Another possible explanation may be that there is less competition for female Vice-Chancellors in Australia relative to the United States. However, looking at the comparative statistics for both Australia and the United States, this does not appear to be a dominant explanation. Given that the pool of potential candidates for these positions tend to have postgraduate qualifications, predominantly a Doctorate, the

¹⁶ The tier ranking system is a ranking of United States colleges and universities compiled by the US News and World Report magazine based on a combination of institutional statistics and surveys of university faculty and staff members. The top tier is the first tier (Morse and Flanigan, 2004).

¹⁷ Coefficient reported after an anti-log adjustment.

proportion of doctoral degrees conferred in both countries is similar, at 1.8 percent of all degrees for the United States¹⁸ (Knapp et al., 2004) and 2.2 percent for Australia¹⁹ (Department of Education, Science and Training, 2004c). Breaking this down by gender, the proportion does not differ substantially between the two countries, with 53.7 percent of recipients being male and 46.3 female in the United States, with the corresponding statistics at 55.4 and 44.6 percent being male and female, respectively, in Australia. If women are under-represented among PhD recipients and top university management, the more intense competition for female candidates does not appear to be a dominant factor in explaining the remuneration differential to females in the United States relative to Australia.

1.6 An International Comparison of Vice-Chancellors

In this section, we compare the remuneration of Vice-Chancellors in Australia to their counterparts in the United States and the United Kingdom using the approach of Ong and Mitchell (2000) who look at academic salaries. Ong and Mitchell argue that what is relevant when comparing remuneration is the purchasing power of income. Using current exchange rates to compare remuneration is inappropriate because purchasing power differentials between countries are only reflected in exchange rates in the long run. A more meaningful measure is real Vice-Chancellor remuneration in each country.

The relative price index used is the Big Mac index. This is appealing as the Big Mac is representative of a standard basket of goods and services, being made to the same recipe in over 100 countries around the world. Table 1.7 shows the Big Mac Purchasing Power Parity (PPP).

From Table 1.7, in the United States US\$1 of earnings buys $1 / 2.49 \approx .40$ Big Macs, whereas in Australia, A\$1 buys $1 / 3.00 \approx .33$ Big Macs. Accordingly, to compare earnings in the two countries in terms of Big Macs, the purchasing power of US\$1 relative to A\$1 is about $.4 / .3 \approx 1.33$. From the second last column of Table 1.7, US\$1 costs A\$1.86, so we see that on the basis of the Big Mac Index the Australian dollar is substantially undervalued – the last column of the Table reveals that it is undervalued by 35 percent, while the British pound is overvalued by 16 percent. A

¹⁸ This relates to the academic year 2001-02.

¹⁹ This relates to the 2002 year (snapshot taken at 31 March).

Vice-Chancellor would have to earn A\$1.20 to maintain the same purchasing power in Australia for every dollar earned in the United States. Using the market exchange rate would overestimate the cost of living in Australia relative to that in the United States.

The data for Vice-Chancellors' remuneration in the United Kingdom is sourced from the *Times Higher Education Supplement*, while that for the United States is sourced from the *Chronicle of Higher Education*.²⁰ One weakness of this analysis is that there is no control for size differences across institutions as the data is not readily available. The United States is used to standardise as a benchmark. The results are shown in Table 1.8.

Panel A of Table 1.8 shows the difference in real remuneration between countries. The final row of Panel A reveals that Vice-Chancellors in Australia are the highest paid with real remuneration that is 43 percent higher than in the United States. However, the Vice-Chancellors in the United Kingdom have 31 percent less purchasing power relative to the United States. This indicates that Vice-Chancellors are the lowest paid in the United Kingdom and the highest paid in Australia. It is possible that the differential reflects that Australian Vice-Chancellors are better than those in the United States or United Kingdom. Alternatively, the remuneration differences may reflect differences in the size of the institutions. The standard errors are also higher in Australia than the United States or the United Kingdom which suggests that in Australia there is more dispersion in size across institutions relative to other countries, or it may just reflect the lower number of observations for Australia.²¹

²⁰ Monash University is excluded for Australia as this is an outlier.

²¹ As standard error is inversely proportional to the square root of the number of observations.

Table 1.7
THE BIG MAC INDEX, 2002

| Country | Big Mac price | | Big Mac PPP in US\$ | Actual Exchange Rate (local currency cost of US\$1) | Under/Over valuation (%) |
|---------------|----------------|---------|------------------------|--|-----------------------------|
| | Local currency | in US\$ | | | |
| United States | US\$2.49 | 2.49 | - | - | - |
| Australia | A\$3.00 | 1.61 | 1.20 | 1.86 | -35 |
| Britain | £1.99 | 2.89 | 0.80 | 0.69 | 16 |

Source: *The Economist*, 25 April 2002.

Table 1.8
INTERNATIONAL COMPARISON OF VICE-CHANCELLORS

| | Australia | United States | United Kingdom |
|--|------------|---------------|----------------|
| <u>A. Expressed in US PPP dollars</u> | | | |
| Mean | 320,242 | 224,220 | 154,401 |
| Median | 323,700 | 203,697 | 157,658 |
| Standard Error | 16,253 | 5,599 | 2,730 |
| Mean as a percentage of the US | 143 | 100 | 69 |
| <u>B. Local currency</u> | | | |
| Mean | A\$385,833 | US\$224,220 | £123,397 |
| Median | A\$390,000 | US\$203,697 | £126,000 |
| Standard Error | A\$19,582 | US\$5,599 | £2,181 |
| <u>C. Expressed in US dollars at market exchange rates</u> | | | |
| Mean | 207,437 | 224,220 | 178,926 |
| Median | 209,677 | 203,697 | 182,700 |
| Mean as a percentage of the US | 93 | 100 | 80 |
| Number of observations | 30 | 594 | 162 |

Panel C of Table 1.8 highlights the fallacy of using market exchange rates to compare remuneration across countries. If market rates are used, it appears that Australian Vice-Chancellors are slightly underpaid relative to the United States, as are Vice-Chancellors in the United Kingdom, although the extent of underpayment for the latter falls to 20 percent. If the medians are used, a different picture emerges; Australian Vice-Chancellors receive marginally (3 percent) higher remuneration relative to the United States, while Vice-Chancellors in the United Kingdom receive lower remuneration, but the extent of the underpayment is less severe at only 10 percent. However, using market rates means that these figures do not reflect purchasing power as the differentials between countries are reflected in exchange rates only in the long run and due to the high volatility in exchange rates, the comparison is subject to substantial noise and inaccuracy. Figure 1.7 brings out the differences in using PPP exchange rates versus market rates to compare remuneration across countries. It shows that the cross-country dispersion of remuneration is higher when PPP is used. This is in contrast to the usual argument that currencies of rich countries tend to be overvalued relative to PPP such that incomes in these countries are overestimated, while those in poor countries are underestimated. The result is that international inequality is overestimated when market exchange rates are used (Clements and Lan, 2004). While the Big Mac

index is not a perfect measure of purchasing power parity due to frictions such as barriers to trade caused by transportation costs, trade restrictions and taxes, differences in the cost of non-traded goods and different pricing methods (Pakko and Pollard, 2003), it has been found to be surprisingly accurate in tracking exchange rates in the long term (Ong, 2003). Figure 1.8 plots the distribution of remuneration for each of the countries in the analysis using the same scale on the horizontal axis for easy comparison. The distribution for Australia (panel A) most likely reflects the relatively low number of observations in the sample. The distribution for the United Kingdom (panel C) reflects the relatively low level of variation in the sample.

In addition to remuneration, a Vice-Chancellor also needs to consider the taxation arrangements in each country. One may be better off going to a country with lower remuneration but lower taxes than a country with higher remuneration and taxes. Table 1.9 shows an index of gross and net wages over the period 2001-2003.

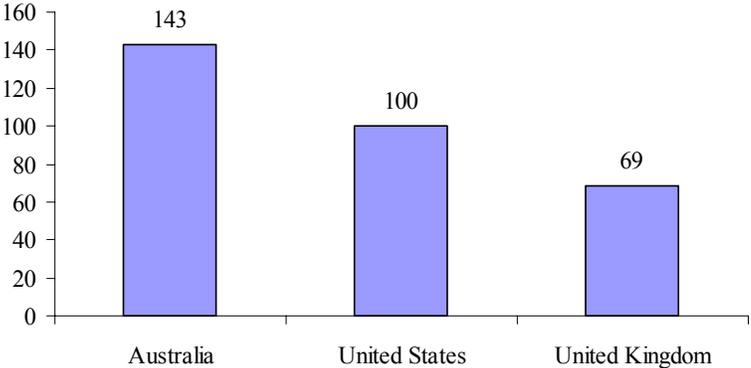
Table 1.9
INDEX OF GROSS AND NET WAGES, 2001-2003

| Country | Gross Wages | Net Wages |
|-------------|-------------|-----------|
| Chicago | 100.0 | 100.0 |
| Los Angeles | 87.5 | 90.0 |
| London | 79.5 | 78.9 |
| Sydney | 48.7 | 50.2 |

Source: UBS (2003).

Table 1.9 shows that, on average, taxes and other contributions take up a higher proportion of gross salaries in Chicago and London than in Sydney and Los Angeles. Wage deductions are similar in Los Angeles and Sydney. Taking taxes and other social contributions into account, the remuneration of Vice-Chancellors in Australia is even more attractive, relative to the United States and United Kingdom.

Figure 1.7
CROSS COUNTRY COMPARISONS OF VICE-CHANCELLOR REMUNERATION
A. PPP Exchange Rates



B. Market Exchange Rates

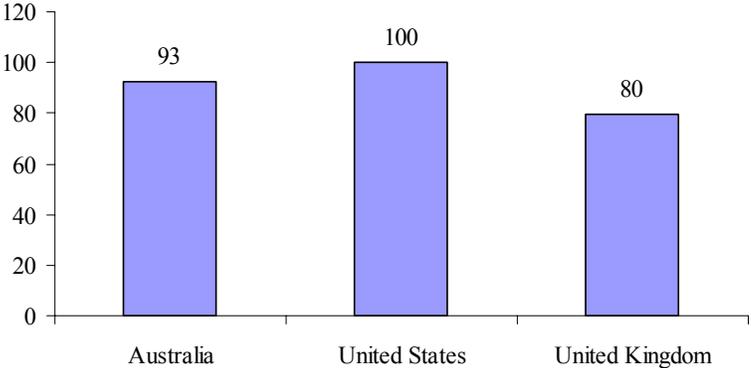
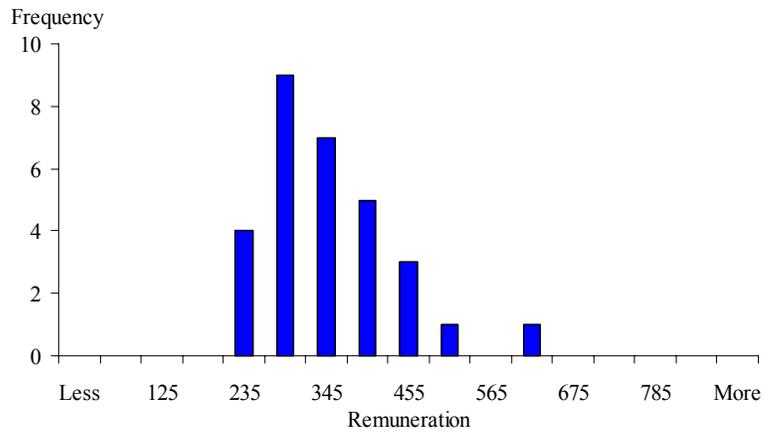


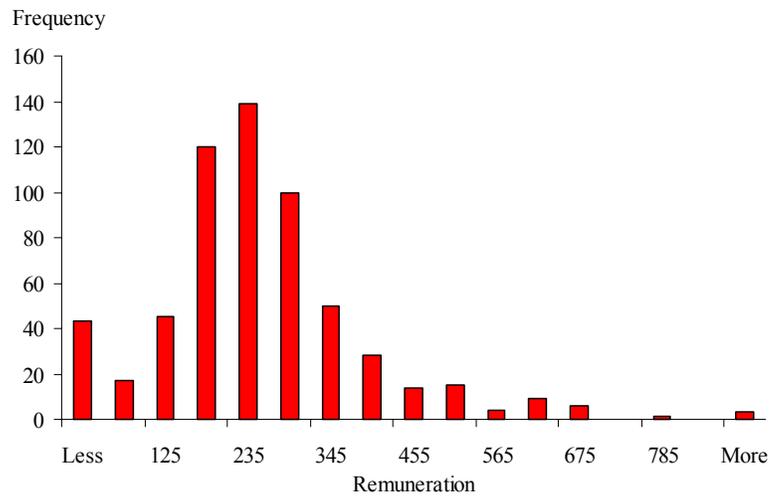
Figure 1.8
 DISTRIBUTION OF VICE-CHANCELLOR REMUNERATION
 (US PPP dollars)

A. Australia



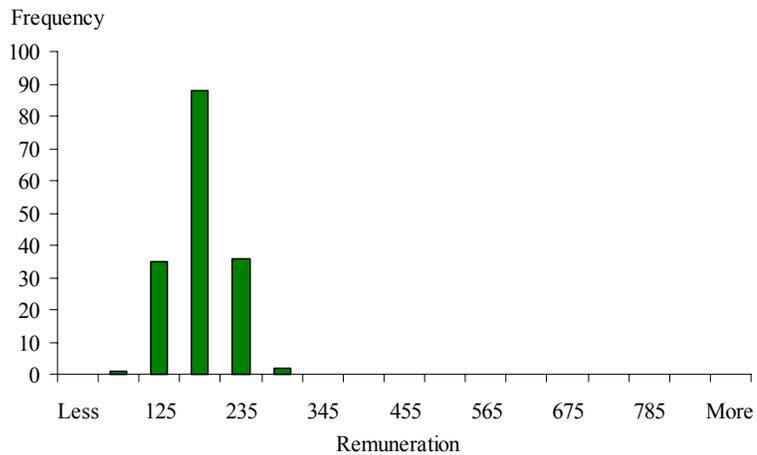
Source: University Annual Reports.

B. United States



Source: *Chronicle of Higher Education*.

C. United Kingdom



Source: *Times Higher Education Supplement*.

Another consideration for a Vice-Chancellor is the quality of life. A Vice-Chancellor may choose to trade off remuneration for other benefits offered by a particular country. To compare quality of life, the Quality of Life Survey produced by Mercer Human Resource Consulting is used.²² This ranks countries on political, social, economic and environmental factors, personal safety and health, education, transport and other public services. Scores are standardised against New York as the base city with an index of 100. Results are shown in Table 1.10.

Table 1.10
QUALITY OF LIFE RANKINGS, 2002

| City | Country | Index |
|-----------|----------------|-------|
| Chicago | United States | 100.0 |
| New York | United States | 100.0 |
| Boston | United States | 100.0 |
| London | United Kingdom | 100.0 |
| Sydney | Australia | 105.5 |
| Melbourne | Australia | 104.0 |
| Perth | Australia | 103.0 |
| Brisbane | Australia | 102.0 |
| Adelaide | Australia | 101.0 |

Source: Mercer Human Resource Consulting (2003).

From Table 1.10, it is clear that of the cities in the sample, Australia is the best place to live overall with the highest quality of life measures relative to the United States and United Kingdom. Moreover, it appears that the United States and the United Kingdom have a similar quality of life.

Overall, it appears that Vice-Chancellors in Australia are remunerated on the best terms, relative to their counterparts in the United States and United Kingdom. Not only do they have higher real salaries, their remuneration is also more attractive once taxation and social security deductions are considered. In addition, they also enjoy a higher quality of life. This analysis indicates that there is considerable variation in the way Vice-Chancellors are remunerated internationally, with Australian Vice-Chancellors enjoying the highest real remuneration, combined with an attractive taxation structure and higher quality of life relative to Vice-Chancellors in the United

²² Mercer surveys 235 cities worldwide based on 39 factors in 10 categories (political and social environment; economic environment; socio-cultural environment; medical and health considerations; schools and education; public services and transport; recreation; consumer goods; housing and natural environment) to provide tangible values for qualitative perceptions to allow objective assessments of the quality of living (Mercer Human Resource Consulting, 2003).

Kingdom and Presidents in the United States. This finding leads to interesting further questions, such as, why is the market for Vice-Chancellors not well arbitrated internationally? In the future, can we expect to see more people from overseas becoming Vice-Chancellors in Australia?

1.7 Comparing Remuneration: The Case of Vice-Chancellors versus CEOs

In this section, we compare Vice-Chancellor to CEO remuneration. Vice-Chancellors are regarded as the CEOs of these institutions so it is of interest to see if there is any consistency between these two markets in terms of remuneration setting.²³ Panel A of Figure 1.9 shows the distribution of Vice-Chancellor remuneration while Panel B shows the distribution of CEO remuneration.²⁴ As the figure shows, the magnitude and dispersion of CEO remuneration is much greater than that of Vice-Chancellor remuneration, reflecting differences in the structure of remuneration. The mean remuneration of CEOs is almost 7.5 times that of Vice-Chancellors, though when comparing medians this difference is only fourfold, due to the strong positive skew in the distributions and the existence of outliers for CEOs. Both distributions show evidence of kurtosis, though this is more pronounced for Vice-Chancellors than CEOs. To more formally compare remuneration between the two groups, the comparative model run is:

$$\log y_{it} = \beta_0 + \beta_1 \log(\text{revenue})_{it} + \beta_2 D_{it} + \varepsilon_{it}, \quad i \in \text{universities and companies}. \quad (1.4)$$

For institution i in year t , y is the remuneration of the Vice-Chancellor or CEO. The independent variable used here is revenue in year t , as this variable makes sense both as a corporate and university measure that may be related to remuneration. To control for the effects of inflation, remuneration and revenue are expressed in constant 1996 dollars. Baimbridge and Simpson (1996) find that revenue is positively and significantly related to Vice-Chancellors' remuneration in the United Kingdom. Note that we are deliberately using only one variable here due to the data availability problems with universities. Revenue is used as a proxy for size as it is available for

²³ The data for CEO remuneration is from Lieu's (2003) Honours dissertation on Australia's participation in the global market for CEOs. It includes firms among the top 125 in Australia (ranked by market capitalisation) during the years 1999-2003. Remuneration has been pro-rated for a full year of work, in the case that the CEO left the position mid-way through the year. For CEOs paid in foreign currency, remuneration has been converted to Australian dollars based on the rate as at annual reporting date. The sample consists of 124 company years and 179 university years.

²⁴ The distribution of CEO remuneration is adapted from Lieu (2003).

universities (and companies) and past research has identified size as the key driver of CEO pay (Murphy, 1999). D is a dummy variable that takes the value of 1 for Vice-Chancellors and 0 otherwise. Accordingly, equation (1.4) controls for the size of institutions (universities and companies) by holding revenue constant and then says that relative to CEOs in the private sector, the logarithmic difference of Vice-Chancellors' remuneration is $\gamma \times 100$ percent. The results are shown in Table 1.11.

Figure 1.10 shows the results from panel B of Table 1.11. The large outliers above and below the regression line for universities are also shown. It is perhaps not surprising that each of these outliers correspond to a year in which Vice-Chancellor turnover occurred with the remuneration figure including termination payments.²⁵

If the coefficient on revenue is constrained to be the same for companies and universities, then an unambiguous measure of the discount to universities can be obtained. Figure 1.10 and panel B of Table 1.11 show this: relative to CEOs, the logarithmic difference of Vice-Chancellors is 90 percent lower, which translates into a percentage discount of about 60 percent. All coefficients are highly significant. Cornell (2002) in a study on US Presidents²⁶ finds that CEO pay is 32-36 times that of President pay. Why is there such a large discount and why do we not see more discontent from Vice-Chancellors about this? This finding suggests that the market for Vice-Chancellors is segmented from the market for CEOs in Australia and internationally (Merhebi et al., 2003). It also suggests that there are large differences in goals and incentives provided in the market for university managerial talent, consistent with Roomkin and Weisbrod (1999).

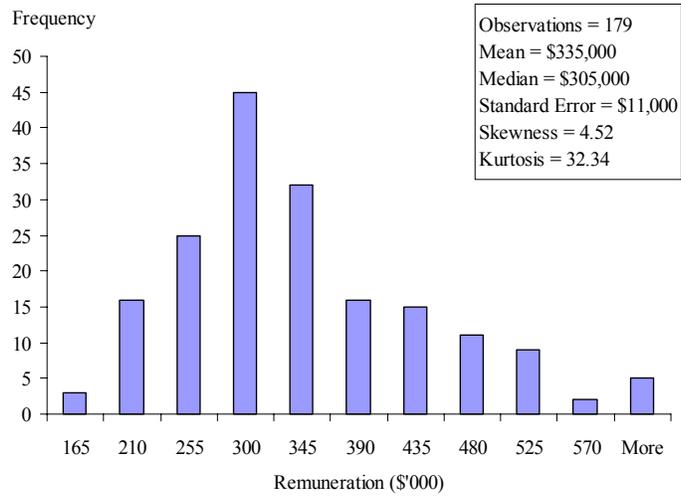
²⁵ In Appendix A2, we re-estimate the Vice-Chancellor/CEO remuneration model to control for turnover. The results show that turnover is not associated with significantly higher remuneration.

²⁶ The CEO of universities in the British tradition (Australia, Canada, New Zealand, etc.) are known as "Vice-Chancellors", while in the United States they are known as "Presidents".

Figure 1.9

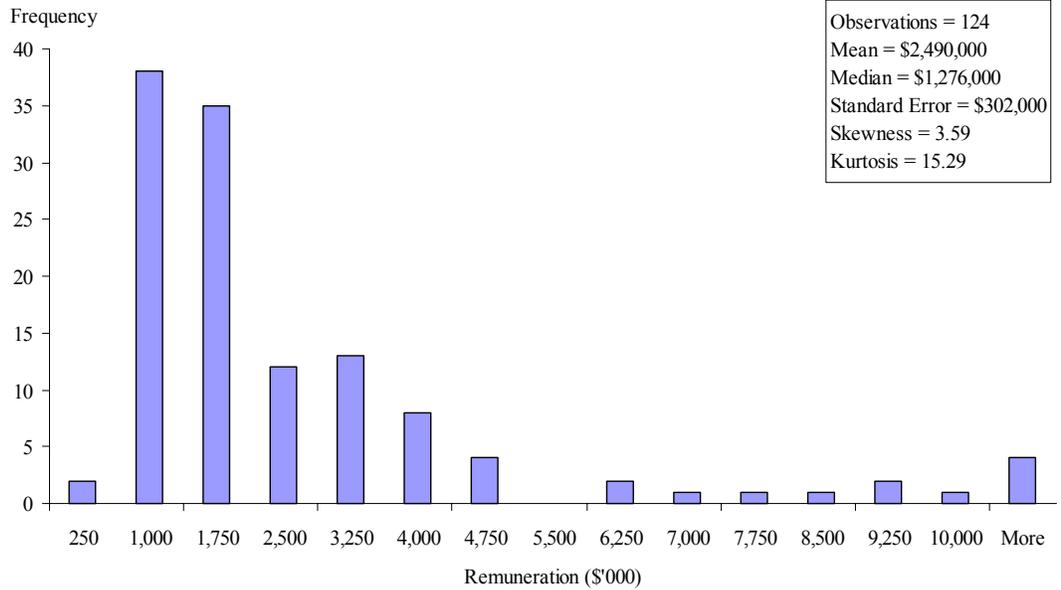
DISTRIBUTION OF VICE-CHANCELLOR AND CEO REMUNERATION

A. Vice-Chancellors



Source: University Annual Reports.

B. CEOs



Source: Lieu (2003).

Table 1.11
 VICE-CHANCELLOR VERSUS CEO REMUNERATION
 (standard errors in parentheses)

| Variable/Coefficient | | Value | \bar{R}^2 | df |
|---|------------|------------|-------------|-----|
| A. $\log y_{it} = \alpha_0 + \alpha_1 \log(\text{revenue})_{it}^{\text{company}} + \alpha_2 \log(\text{revenue})_{it}^{\text{university}} + \alpha_3 D_{it} + \varepsilon_{it}$ | | | | |
| Intercept | α_0 | 8.59 (.37) | | |
| $\log(\text{revenue})^{\text{company}}$ | α_1 | .39 (.03) | | |
| $\log(\text{revenue})^{\text{university}}$ | α_2 | .27 (.05) | | |
| D_{it} | α_3 | .75 (.74) | .76 | 299 |
| B. $\log y_{it} = \beta_0 + \beta_1 \log(\text{revenue})_{it} + \beta_2 D_{it} + \varepsilon_{it}$ | | | | |
| Intercept | β_0 | 8.95 (.33) | | |
| $\log(\text{revenue})$ | β_1 | .37 (.02) | | |
| D_{it} | β_2 | -.90 (.07) | .76 | 300 |
| C. $\log y_{it} = \gamma_0 + \gamma_1 \log(\text{revenue})_{it} + \gamma_2 D_{it} + \gamma_3 \text{Go8}_{it} + \varepsilon_{it}$ | | | | |
| Intercept | γ_0 | 8.82 (.35) | | |
| $\log(\text{revenue})$ | γ_1 | .38 (.02) | | |
| D_{it} | γ_2 | -.86 (.08) | | |
| Go8 | γ_3 | -.10 (.09) | .76 | 299 |

F statistic for $\alpha_1 = \alpha_2$ is 4.97 (p-value .03).

The slope coefficient of .37 represents the elasticity of remuneration to revenues. As it is less than one, it implies that there are economies of scale to remuneration – an institution that is 10 percent larger will pay its CEO 3.7 percent more. Murphy (1999) calculates this elasticity using S&P 500 CEO salaries and bonuses; for the period 1990-1996 the elasticity is .21.²⁷ It is of interest that the two numbers are comparable in magnitude. What is the marginal effect on remuneration of an increase in size? As the elasticity of remuneration with respect to revenue is .37, the marginal effect $\partial P/\partial R$ in universities is $.37(P/R) = .41$ if we use sample means. In other words, if an institution were to increase its revenues by one thousand dollars, the corresponding average increase in remuneration is 41 cents.

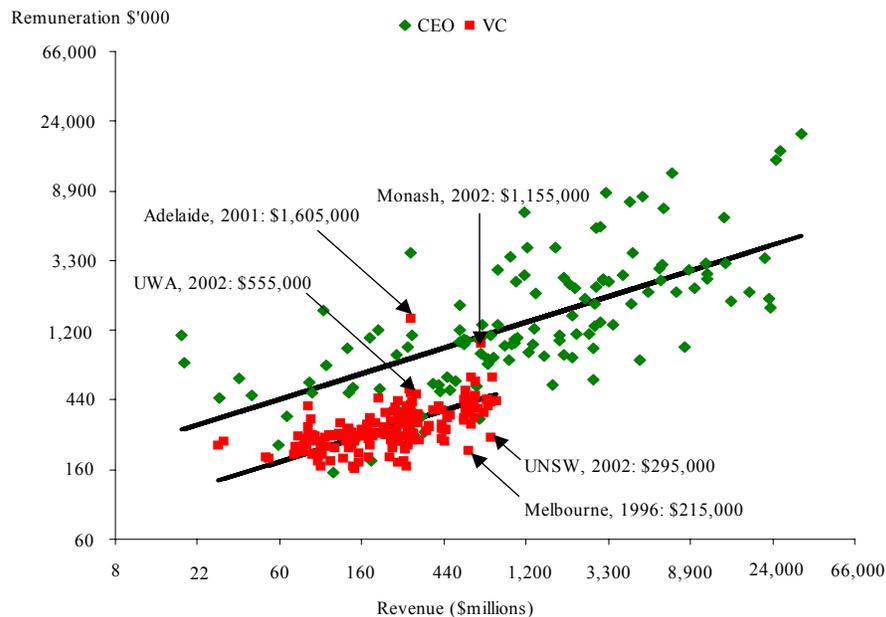
²⁷ This is calculated as the average of the elasticity of compensation with respect to sales revenue for each industry group.

Panel C²⁸ of Table 1.11 shows that after controlling for revenue, membership of an institution to the Group of Eight has no significant effect on remuneration. This suggests that the key driver of remuneration is size rather than reputational considerations. Recall that when modelling the determinants of Vice-Chancellor remuneration in section 5.5, the Group of Eight dummy variable was not significant for the overall sample but significant when looking at the period 2001-2002, which may indicate the growing importance of reputational considerations over time.

Figure 1.10

VICE-CHANCELLOR VERSUS CEO REMUNERATION: THE UNIVERSITY DISCOUNT

$$\log(\text{Remuneration})_{it} = 8.95 + .37 \log(\text{revenue})_{it} - .90 D_{it}, \bar{R}^2 = .76$$



²⁸ Panel C of Table 1.11 includes a Group of Eight dummy variable that is equal to one if an institution is a member of the Group of Eight and zero otherwise.

Table 1.12

PERCENT RELATIVE OVER/UNDER PAYMENT OF VICE-CHANCELLORS

| Institution | % | Institution | % |
|--|-------|--------------------------------------|------|
| 1. University of Technology Sydney | -19.0 | 18. Victoria University | 1.3 |
| 2. Curtin University of Technology | -16.4 | 19. La Trobe University | 2.6 |
| 3. Australian National University | -14.0 | 20. Deakin University | 3.6 |
| 4. Edith Cowan University | -12.4 | 21. University of New England | 4.9 |
| 5. James Cook University | -11.8 | 22. University of Western Australia | 5.9 |
| 6. University of Newcastle | -8.8 | 23. QUT | 6.2 |
| 7. RMIT | -7.7 | 24. Central Queensland University | 6.2 |
| 8. University of Melbourne | -7.2 | 25. University of Sydney | 10.2 |
| 9. University of Southern Queensland | -6.7 | 26. University of Canberra | 13.6 |
| 10. University of Tasmania | -5.4 | 27. University of Wollongong | 21.4 |
| 11. University of New South Wales | -5.3 | 28. University of Western Sydney | 22.8 |
| 12. Murdoch University | -5.0 | 29. Southern Cross University | 24.7 |
| 13. Swinburne University of Technology | -3.5 | 30. Monash University | 27.2 |
| 14. Australian Catholic University | -2.5 | 31. University of Adelaide | 37.9 |
| 15. Charles Sturt University | -1.7 | 32. University of the Sunshine Coast | 38.1 |
| 16. Griffith University | -1.4 | 33. Macquarie University | 44.8 |
| 17. University of Ballarat | -0.7 | 34. University of Queensland | 51.3 |

Table 1.12 gives the average over time of the residuals from the model in panel A of Table 1.11 converted into percentages for each institution; this represents the average percentage over/underpayment to the Vice-Chancellor relative to what is expected on the basis of size. Here, as we use the model with the university dummy included, we are comparing remuneration in each university with the all-university average; this means that the measure of the over/under payment is zero on average. From this table, relatively speaking, Vice-Chancellors at the University of Technology Sydney are, on average, the most underpaid, while Vice-Chancellors at the University of Queensland are the most overpaid. Table 1.13 shows the logarithmic residuals by institution and year calculated from the model in Panel A of Table 1.11. A blank indicates that the observation was not available for that year. These were converted into percentage differences and averaged over time for each institution to give the results in Table 1.12.

Table 1.13

RESIDUALS BY INSTITUTION AND YEAR

| Institution | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|------|------|------|------|------|------|------|------|
| 1. Australian Catholic University | -.07 | .02 | - | - | - | - | - | - |
| 2. Australian National University | -.38 | -.32 | -.20 | -.21 | -.17 | -.13 | -.04 | .15 |
| 3. Central Queensland University | - | - | - | - | .22 | .11 | - | -.19 |
| 4. Charles Sturt University | - | - | - | - | - | .06 | -.08 | -.04 |
| 5. Curtin University of Technology | -.29 | -.22 | -.52 | -.60 | -.21 | .09 | .11 | -.02 |
| 6. Deakin University | .09 | -.42 | -.18 | .11 | .11 | .02 | .14 | .26 |
| 7. Edith Cowan University | -.43 | -.48 | -.39 | -.26 | -.03 | -.03 | .11 | .21 |
| 8. Griffith University | - | - | - | - | - | .02 | -.05 | - |
| 9. James Cook University | -.28 | - | - | - | - | -.12 | -.07 | -.04 |
| 10. La Trobe University | -.09 | -.14 | -.05 | .02 | .07 | .09 | .16 | .12 |
| 11. Macquarie University | - | - | - | - | - | .45 | .35 | .30 |
| 12. Monash University | .13 | .28 | -.11 | -.01 | .02 | .18 | .09 | .93 |
| 13. Murdoch University | -.33 | -.29 | -.12 | .07 | .06 | .03 | -.05 | .11 |
| 14. Queensland University of Technology | - | - | - | - | .00 | .08 | .05 | .11 |
| 15. RMIT | -.16 | -.10 | -.12 | - | - | .09 | -.19 | -.02 |
| 16. Southern Cross University | - | - | - | - | - | .03 | -.07 | .57 |
| 17. Swinburne University of Technology | -.15 | -.07 | .01 | -.03 | -.01 | -.06 | .03 | .00 |
| 18. University of Adelaide | -.22 | -.52 | .15 | -.24 | -.26 | .49 | 1.51 | -.27 |
| 19. University of Ballarat | - | -.03 | -.05 | .02 | .05 | .27 | -.25 | -.14 |
| 20. University of Canberra | -.14 | .12 | .13 | .13 | .14 | .11 | .05 | .37 |
| 21. University of Melbourne | .22 | -.58 | -.22 | -.14 | .00 | -.10 | .00 | .05 |
| 22. University of New England | - | - | - | - | - | .06 | .00 | .08 |
| 23. University of New South Wales | - | - | -.14 | -.04 | .01 | .13 | .08 | -.47 |
| 24. University of Newcastle | - | - | - | - | -.09 | -.08 | -.09 | -.10 |
| 25. University of Queensland | - | - | - | - | - | .46 | .39 | .39 |

Continued next page...

Table 1.13

RESIDUALS BY INSTITUTION AND YEAR (continued)

| Institution | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---------------------------------------|------|------|------|------|------|------|------|------|
| 26. University of Southern Queensland | - | - | - | -.17 | -.17 | -.02 | -.06 | .06 |
| 27. University of Sydney | - | - | - | - | - | .15 | .09 | .04 |
| 28. University of Tasmania | - | - | - | - | .05 | .02 | .00 | -.35 |
| 29. University of Technology Sydney | - | - | - | - | -.21 | -.17 | -.11 | .07 |
| 30. University of the Sunshine Coast | - | - | - | - | - | - | .35 | .30 |
| 31. University of Western Australia | -.36 | -.32 | .43 | -.17 | .08 | .04 | .06 | .40 |
| 32. University of Western Sydney | - | - | - | - | - | .15 | .26 | - |
| 33. University of Wollongong | - | - | - | - | - | .11 | .24 | .23 |
| 34. Victoria University | - | - | .07 | -.02 | -.11 | -.09 | -.10 | .27 |

1.8 Summary

Despite substantial research on the market for CEOs, we know little about how the market for Vice-Chancellors in Australia operates. What do we know now? It appears that relative to CEOs, Vice-Chancellors are appointed at later ages and do not have shorter tenures. Like CEOs, most Vice-Chancellors are turned over prior to reaching retirement age. There appear to be differences in the dynamics of the two markets, with little evidence of Vice-Chancellor appointment following a tournament theory-like process and little evidence of compensation based on financial performance measures such as earnings. When comparing remuneration between universities and companies, while the size elasticity of remuneration is similar between the two institutions (panel A of Table 1.11, companies .39, universities .27), Vice-Chancellors accept a discount of 60 percent relative to their private sector counterparts. Hence, if universities are facing increased corporatisation pressure, its effects appear to be asymmetric in that executive remuneration does not appear to be set on a similar basis across universities and companies.

Comparing the market for Vice-Chancellors internationally, Australian Vice-Chancellors compare favourably to their counterparts in the United States and United Kingdom. They enjoy the highest real remuneration and after factoring in the taxation arrangements and quality of life, their advantage is further enhanced. If international arbitrage forces are at work in the market for Vice-Chancellors, then in the future, the remuneration of Australian Vice-Chancellors may fall, or we may see more individuals from overseas taking up these positions.

What are the implications of the corporatisation of universities? Firstly, it seems plausible that increased pressure for accountability may result in greater pressure for Vice-Chancellors to perform and greater incentive alignment, so that in the future, we may see evidence of performance driven turnover in this sector. Secondly, Vice-Chancellor remuneration may increase to a level more comparable to CEOs, if they are indeed regarded as the CEOs of these institutions. However, the two markets may never meet if the goals of the two segments are divergent enough to keep these markets distinct.

Given that universities are classified as nonprofit organisations and the difficulty in obtaining meaningful measures of certain outcomes in a university context, it is possible that the disparity in the way top executives are remunerated between firms and universities will persist.