

## GOVERNANCE INDICES: AN AUSTRALIAN PERSPECTIVE

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### Abstract

This study develops a weighted internal governance index as a comprehensive proxy of good governance in Australia. We identify those variables empirically found to be associated with good governance and include them in a principal component analysis to calculate the index. We apply Principal Component Analysis to examine the internal governance of a sample of 450 listed Australian companies for the period 1999 – 2006. Results indicate that there are two key facets to internal governance in Australia: Board Activity and Board Independence. They in turn incorporate eight specific governance factors which are included in the index on a weighted basis. This approach contributes to the literature by overcoming a number of limitations of previous governance measures and is the first internal governance index to be developed. A similar approach could be employed in other countries to overcome difficulties with previous index efforts and to provide a more comprehensive measure of firm level (internal) governance. The findings of this study have many implications: for firms, there is now a straight forward basis on which to compare their governance standards with those of competitors as well as against prior years. For investors, they can now easily identify which firms are better governed and incorporate this factor in the share selection process as well as lobby for further improvements.

**Keywords:** Corporate Governance, Internal Corporate Governance, Governance Index

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### Introduction

This study develops a weighted internal governance index as a comprehensive proxy of good governance in Australia. We identify those variables empirically found to be associated with good governance and include them in a principal component analysis to calculate the index. Results indicate that there are two key facets to internal governance in Australia: Board Activity and Board Independence. They in turn incorporate eight specific governance factors which are included in the index on a weighted basis. This approach contributes to the literature by overcoming a number of limitations of previous governance measures.

Agency theory advocates that where ownership is widely dispersed managerial goals may depart from maximising shareholders wealth (Berle & Means, 1932; Pratt & Zeckhauser, 1985). Berle & Means (1932) argue that managerial share ownership in large firms is an insufficient incentive to ensure that they will seek to maximise shareholder wealth. Furthermore, with the separation of ownership and control the goals of managers, shareholders and debt holders often become misaligned. Agency costs stem from those actions of management (agents) that reduce shareholders wealth. Empirical evidence show

firms with lower managerial share ownership are more likely to make wasteful decisions such as unrelated acquisitions (Hanson & Song, 2006) which may reduce shareholders wealth. In addition Jensen & Meckling (1976) also identify a “managerial opportunism” problem. They argue that with reduced ownership, managers have increased incentives to consume perquisites and similarly reduce shareholders wealth. This agency problem is widely cited as a reason for earnings management, low quality internal controls and poor disclosures (Jensen, 1993).

Good quality corporate governance has been found to address some of these agency problems (Bruno & Claessens, 2006). Empirical evidence show that regulated firms are likely to incur lower agency costs since regulation tends to reduce managerial discretion (Booth et al. 2002; Kole & Lehn, 1997). It would appear that good corporate governance is therefore essential in alleviating agency issues and their associated costs.

Corporate governance is the system by which companies are directed and controlled (Gillan & Starks, 2000). The mechanism through which public firms are governed can be categorised as internal or external (Cremers & Nair, 2005). Firm level control mechanisms (i.e. independent board of directors)

implemented when firms strive to obtain good governance is generally considered to constitute internal governance. External governance refers more to the market for corporate control and takeovers and is driven primarily by country laws and institutions, cultural norms and other monitors. Firms with better internal governance quality appear to have better external governance (Gillan et al. 2003) and it seems that good internal governance quality is required to ensure external governance mechanisms function suitably (John & Kedia, 2004). Australian regulatory reforms (ASX GCG, 2003; CLERP 9)<sup>1</sup> suggest what constitutes best practise in the monitoring of management and financial disclosure. As such a firm with good internal governance can be defined as one that follows their monitoring, disclosure and control best practise mechanisms. Studies show that good internal governance structures are associated with a lower likelihood of misstating accruals to serve management interests and so to reduce agency problems (Davidson et al. 2005). Firms have control over the quality of monitoring and disclosures and as such internal governance is likely to signal quality to investors. As such investors should pay more attention to this when investigating firm governance quality and compliance than to external governance.

So good quality internal governance is important (Gillan et al. 2003), but how can one compare internal governance quality across firms or assess whether quality has changed over time? An effective internal governance index would seem the logical answer and our motivation here is therefore to develop such a proxy. Studies to date incorporate individual governance characteristics (Klein, 2002) or a combination of independent variables in their regression models (Davidson *et al.* 2005; Benkel et al. 2006) to proxy for good governance. These methods, however, fail to recognise that certain governance characteristics measure similar aspects (so highly correlated) and are thus not equally important in ensuring governance quality. In addition, whilst regulatory guidelines related to the governance system as a whole, most studies have investigated only a particular aspect (i.e. audit committees) thereof.

A more comprehensive approach would include a variety of governance measures and a number of studies have addressed this issue through index building. Whilst a number of governance indices have indeed been developed (Gompers et al. 2003; Bebchuk et al. 2005; Brown & Caylor, 2006; Larcker et al. 2007), they suffer from many problems. They include mainly external, anti-takeover<sup>2</sup> measures (Gompers et al. 2003; Bebchuk & Cohen, 2005) and calculate “arbitrary indices”, naively summing a set of dummy indicators to compute their index value. This implies equal weighting of governance factors without considering any correlations between the variables. Larcker et al. (2007) attempt to overcome this “arbitrary index” problem through principal component analysis but their implementation was not

completely correct<sup>3</sup>. These governance indicators in any case have focussed thus far on the US market and no comprehensive internal governance proxy has been developed for Australia<sup>4</sup>. For both firms and investors wanting to compare their governance quality with other firms, a comprehensive measure of governance is required. Such a measure could also assist regulators in determining the impact of governance reforms.

The study applies principal component analysis to examine the internal governance of a sample of 450 listed Australian companies for the period 1999 – 2006. Results indicate that there are two components to the corporate governance construct. We label these “Board Activity” and “Board Independence” and include their associated eight variables (five and three respectively) in a weighted internal governance index. This is then used to compute a governance score for each sample firm.

This study makes several contributions to the governance literature. First by extending the calculation of governance indices to the Australian environment, a new comprehensive proxy for governance quality is provided that is both easily calculated and transparent in its methodology. Second, it overcomes some of the major issues that have plagued previous (US-based) governance proxy efforts by employing principal component analysis to develop a weighted index. Finally our 450 firm sample is much larger than previous studies whose much smaller samples did not allow for generalisation (Mallin, 2006).

The rest of this paper is structured as follows: the next section provides an overview of the previous proxies employed for governance together with their methodological limitations. Empirical evidence surrounding the variables selected for the internal governance score is investigated and the data and sample introduced. The methodology for the compilation of the index is then discussed and the paper concluded.

## Measuring Corporate Governance

Given the importance of good governance quality (as explained in the previous section), it is not surprising that its measurement has attracted considerable attention. These efforts at empirical governance measures range from individual variables to calculation of indices (Klein, 2002; Davidson *et al.* 2005; Gompers et al. 2003). Previous works have been questioned over their methodology or variables selections and so an appropriate measure has still not been found. In Australia specifically, no endeavour at a comprehensive index has been made and so we attempt to provide such a measure. This section will discuss variable and methodological problems of previous efforts and propose a better alternative using principal component analysis. Several studies have developed a composite measure of governance; most of these have been in the form of an index.

The earliest efforts to determine a comprehensive governance index was that of Gompers et al. (2003). They include 24 variables in 5 groups, all related to anti takeover measures (external governance). Whilst governance is a function of both internal and external measures, internal governance has been empirically proven to be important in ensuring good external governance (Gillan et al. 2003; John & Kedia, 2004). In any case the G-Index (Gompers et al. 2003) is in essence an anti-takeover rights measure (external corporate governance) which is problematic since these measures are generally associated with bad performance (Larcker et al. 2007). In addition anti-takeover devices have become less important governance measures in recent years (Holstrom & Kaplan, 2001), and it was after all the lack of internal control measures (and audit committee monitoring) that resulted in many governance scandals of the early 2000s. The entrenchment index of Bebchuk & Cohen (2005) consists of a subset of the Gompers et al. (2003) measures and is thus similarly flawed. It would seem more appropriate to consider internal governance measures, such as board and audit independence, in the assessment of governance quality.

In addition to anti-takeover measures, some governance indices studies compute an “arbitrary index” – one where a set of binary variables are naively summed to form the end product, a governance score (Gompers et al. 2003; Bebchuk & Cohen, 2005; Brown and Caylor, 2006). The variables are seemingly included simply because they are available from their relevant data providers. Some are then converted to binary variables, based upon what the data providers “best practise guidelines” recommend and summed to calculate the governance score (Gompers et al. 2003; Bebchuk & Cohen, 2005). Brown & Caylor (2006) include 51 independent variables in a regression on Tobin’s Q and assign binary values to the seven with the most significance to calculate their summary index. They all assume that these variables are equally important (summing binary variables) and have no significant correlations between them. This assumption is not necessarily correct as some have been shown to have significantly more explanatory power whilst others are highly correlated (Larcker et al. 2007). In addition, the assignment of dummy scores based on a data provider’s assessment of what constitutes good governance (as opposed to regulatory requirements) is problematic.

In light of these problems, Larcker et al. (2007) calculate governance indices using exploratory principal component analysis (PCA), including 39 structural measures of corporate governance. This is a significant improvement on previous efforts since it allows for weighted indices compiled of variables that explain most of the variance. Their model overcomes the arbitrary index problem but unfortunately still

suffers from a number of drawbacks. They even concede that some of their PCA results (and variable loadings) are unexpected. Surprisingly instead of recalculating their analysis with a different component number specification or adopting an alternative procedure (such as alpha factoring), they simply assume that their measure is correctly specified. Their PCA dummy variables is a major setback since a main underlying assumption of PCA is that the variables are continuous. When employing PCA to dichotomous variables, tetra choric correlations or the unconditional maximum likelihood process of Christoffersson (1975) needs to be used; they do not employ his procedure. In addition some guidelines, such as the value for communality of variables from PCA (should be > 0.5), was not adhered to. Similarly when testing the internal reliability of their measure, a Cronbach alpha of 0.532 is stated to be acceptable (whereas the acceptable range is generally >0.7; Nunnally, 1976).

In addition to measurement and variable problems, all past efforts have all been US based. Since regulatory differences between countries result in governance differences (La Porta, 1997; 2000), these indices are unlikely to be relevant for the Australian environment. Australian studies have also sought to use more complex measures with Beekes & Brown (2006) incorporating the Horwath governance rankings for 2002 in a cross-sectional study to determine whether better governed firms provide more informative disclosures. These rankings themselves, however, also have many issues, least of which includes availability, sample size and unknown composition. This study therefore develops an internal governance score based upon principal component analysis for the Australian environment.

The next section identifies the benefits associated with good internal governance. We then determine the governance variables to be included in the PCA. The methodology employed to calculate the index is explained later on.

## **Governance Variables**

As explained previously, internal governance indicators are the focus of this study. This is because these measures are within direct control of the firm (Cremers & Nair, 2005) and thus the best indication of firm governance. There are many measures of internal governance that one could potentially include in a comprehensive governance measure. We draw from prior studies and regulatory reform to determine those included in this study.

Previous governance index efforts were discussed earlier. A summary of these efforts respective variables in table 1 show that those items included in Gompers et al. (2003) and Bebchuk et al. (2005) are all external measures and are excluded.

**Table 1**  
Governance variables / categories included in previous studies

Category of variables	Internal or External measure	Variables included in study?		
		Gompers et al. (2003) / Bebchuk & Cohen (2005)	Brown & Caylor (2006)	Larcker et al. (2007)
Tactics for delaying hostile takeovers	External	Yes	Yes	
Voting Rights	External	Yes		
Director / Officer Protection	External	Yes		
Other takeover defences	External	Yes	Yes	Yes
State Laws / Incorporation	External	Yes		Yes
Options / Stock Ownership of directors / institutional investors and activists	External / Internal		Yes	
Directors and the Board	Internal		Yes	Yes
Director / CEO Compensation	Internal			Yes <sup>1</sup>

Source: Compiled by the authors from cited literature (Gompers et al. 2003; Bebchuk & Cohen, 2005; Brown & Caylor, 2006; Larcker et al. 2007).

In contrast, both Larcker et al (2007) and Brown & Caylor (2000) include some internal governance variables related to board characteristics, director and CEO compensation and their share and option ownership. This study similarly includes a number of board composition and activity measures, but excludes director / CEO compensation since this data

is not readily available within the Australian environment. The share and option ownership of directors / CEO is similarly excluded since it has characteristics of external governance. Our final list of 11 board and board activity measures that have empirical or regulatory support and are obtainable from annual reports is shown in table 2.

**Table 2**  
Internal governance variables included in PCA analysis

Characteristic	Evidence supporting its importance as a governance mechanism	Conclusion
Board Size (Bsize)	Yermack, 1996; Jensen, 1993	Smaller board better as long as more than 3 members
Board Independence (Bindep)	Fama & Jensen (1983); Dahya & McConnell (2005); Chen-Lung <i>et al.</i> (2006); Beasley, 1996; Uzun <i>et al.</i> (2004).	The more independent the board the better
Board Meetings (Bmeet)	Vafeas, 1999	The more often the board meets the better
Gray Directors (Gray)	Klein, 1998	The less gray directors (%) the better
Audit Committee Size (Asize)	Klein, 2002	Larger audit committee better (more than 3 members)

Audit Committee Independence (Aindep)	Abbott <i>et al.</i> (2004); Agrawal & Chadha (2005); Klein, 2002.	The more independent the audit committee the better
Diversity	Carter <i>et al.</i> (2003)	Firms with diversified boards better
Audit Committee Meetings (Ameet)	ASX GCG	Recommend regular meetings to review financials
Nomination Committee Meetings (Nmeet)	ASX GCG	Regular meetings required
Remuneration Committee Meetings (Rmeet)	ASX GCG	Regular meetings required
Remuneration Committee Size (Rsize)	ASX GCG	At least 3 members

Source: Compiled by the authors from cited literature and regulatory documents available from: <http://www.shareholder.com/shared/dynamicdoc/ASX/364/ASXRecommendations> (for the ASX GCG). CLERP 9 (Corporation Law Economic reform Program 9) is available from: [http://www.comlaw.gov.au/ComLaw/Legislation/ActCompilation1.nsf/0/3B3EE9EA6EFA3DA7CA256F7100581F1B/\\$file/1032004.pdf](http://www.comlaw.gov.au/ComLaw/Legislation/ActCompilation1.nsf/0/3B3EE9EA6EFA3DA7CA256F7100581F1B/$file/1032004.pdf)

This section provides an overview of empirical findings to date that relates to the 11 internal governance variables included in this study. These variables are board size, -independence, -meetings, gray directors, audit committee size, -independence, -meetings, diversity, remuneration committee size, -meetings and nomination committee meetings.

### Board Size

The board of directors have the responsibility to advise and monitor management and hire / fire and compensate senior management (Jensen, 1993). The board performs a critical role in the protection of shareholders investment and so whether board composition has an impact on this monitoring and control role is very much of interest. The evidence on the optimal board size for good governance is mixed. The average top 100 Australian firms' board consist of nine directors in 2005 (Mallin, 2006). Benkel *et al.* (2006) find an average board size of 7.25 (for their 2001 – 2003 sample) whilst Kang *et al.* (2007) for their 2003 sample report an average of 8.19 members.

The argument for larger boards is that directors' responsibilities can be better divided, as well as having a bigger and better pool of knowledge and expertise available with which to make decisions. Forbes & Milliken (1999) conclude that the variety of experiences, perspectives and strategies within a large board might reduce CEO dominance. In contrast, CEO dominance reduces the monitoring effect of independent directors and is not conducive to good governance (Beasley and Salterio, 2001). Arguments against large boards stem from large group dynamic problems where factions, coalitions and "free-riders" are more likely to exist. These issues might hamper decision making and reduce the effectiveness of board

monitoring (Judge & Zeithaml, 1992; Goodstein *et al.* 1994; Eisenberg *et al.* 1998). Both Jensen (1993) and Lipton & Lorsch (1992) similarly argue that outside directors find it more difficult to influence decision-making and express their ideas within a large board. They suggest that an optimal board size is between 7 and 9 directors. Jensen (1993) also finds CEOs can more easily control a large board. Larger boards therefore seem less favourable. Ironically Chhaochharia & Grinstein (2007) find that board size has increased following the recent governance reforms. This may indicate a possible change in the role of large boards.

A smaller board, in contrast, is found to have better communication, fewer problems with free riders and better coordinated members (Ahmed *et al.* 2006). Whilst some find that board size does not affect the incidence of fraudulent reporting (Uzun *et al.* 2004), the literature seems to favour small boards with many studies proving their worth<sup>5</sup>. Yermack (1996) finds that firms with smaller boards are superior performers. A minimum number of directors are needed in order to have the necessary power and control to effectively monitor management and protect shareholders interest. As such, the ASX GCG (2003) requires the board to have at least three members<sup>6</sup>.

### Board Independence

A recent study of the top 100 Australian companies in 2005 found that approximately 79% of directors were non-executives (Mallin, 2006)<sup>7</sup> whilst for the top 300 Australian firms (2001 – 2003) this percentage decreases to 57.6% (Benkel *et al.* 2006). A non-executive director is a director who is not employed by the firm in any other role than that of director.

Only 65% of these non-executives directors in Australia were found to satisfy Mallin's "independence" criteria. Independent directors are directors who are non-executives of the firm and are not related to the firm (whether business or familial) other than through their role as director. This means they were not previously employed by the firm (within the last 3 years) or a substantial shareholder or an employee with a service provider or major supplier. Independent directors are expected to exercise their duties of loyalty and care and use good judgement to protect shareholders interest (Lorsch & MacIver, 1989). Whilst these directors might still seek to benefit themselves at the expense of shareholders, they are less likely to do so as their reputation would suffer severely in such circumstances.

The board can perform their duties more effectively when there is a majority of non-executive directors (Fama and Jensen, 1983); such boards are also less likely to collude with management. Dahya & McConnell (2005) similarly find that boards with a majority of non-executive directors make better decisions (and particularly in regards to CEO appointment). Chen-Lung et al. (2006), Beasley (1996) and Uzun et al. (2004) also find that firms with more non-executive directors are less likely to experience fraud. They conclude that this is consistent with non-executive directors monitoring managers and deterring fraudulent acts.

Independent directors are not only useful in reducing the incidence of fraud (Beasley, 1996; Uzun et al. 2004), but the announcement of a new non-executive director appointment have resulted in positive stock price reactions (Rosenstein & Wyatt, 1990). Fleming & Stellios (2002) find support for independent directors in that companies with a lower proportion of non-executive directors are more likely to overpay their CEO. Similarly Weisbach (1988) found that boards dominated by non-executive directors are more likely to remove a poor performing CEO than ones with mostly executive members.

### **Board Meetings**

This variable measures the number of board of director meetings held in the period. It is quite difficult to judge how effective a board is in performing its duties, especially to an outsider. Some boards might be quite active and meet frequently to discuss firm business and so perform their monitoring duties effectively. Others may not be so active and so less effective. The best disclosed proxy for board activity is its number of meetings, as stated in the annual report. Whilst this is only a rough measure of board activity and effectiveness, it is the only one available. The evidence seems to support more meetings rather than less. However, Chen-Lung et al. (2006) find that board meeting frequency is positively associated with fraud, and speculate that this might mean that fraudulent boards meet more often to discuss their questionable / illegal activities. Similarly

Jensen (1993) seem to support less board meetings by stating that a board of directors in a well functioning firm would be fairly inactive. In view of recent governance scandals it would seem logical that the monitoring role of non-executive directors should increase significantly and so they are likely to meet more often. Vafeas (1999) find that higher frequency of board meetings is commonly found after poor financial performance but that this increased meeting frequency subsequently leads to improvements in profitability.

### **Gray Directors**

Gray directors are those directors who are non-executive directors, but have some other relationship with the firm that might impede their independence. Gray directors reduce the overall board independence and so are not contributory to good governance (Klein, 1998). Firms with securities litigation are found to have larger percentages of gray directors (Helland & Sykuta, 2005). As such less gray directors on the board is desirable for good governance.

### **Audit Committee Size**

This variable refers to the number of directors serving on the audit committee. An effective audit committee needs sufficient members to cover its required functions and ensure sufficient monitoring (Dechow et al. 1996; Klein, 2002). The ASX principals of good governance (2003, ASX GCG hereafter) require audit committee to have at least three members. As the literature shows audit committee size to be inversely related to earnings restatement (Lin et al. 2006) and earnings management (Yang & Krishnan 2005), larger than average audit committees appear to be indicative of good governance.

### **Audit Committee Independence**

The audit committee's main role is to oversee the firm's financial reporting process. It arranges regular meetings with external auditors as well as internal financial managers to ensure that financial statements represent a true and fair view of the firm's financial position. It is also responsible for monitoring internal control measures. There is an Australian regulatory requirement (from CLERP 9) that all directors of top 500 firms serving on the audit committee be independent. The ASX GCG similarly recommends that all firms with an audit committee have a majority of non-independent directors.

An independent audit committee helps overcome this moral hazard. There is substantial support for audit committee independence in the literature (Abbott et al. 2004; Agrawal & Chadha; 2005). Specifically Anderson et al. (2005) find that the market attaches more credibility to earnings announcements when both boards and audit committees are independent and active. Similarly Klein (2002) find the magnitude of abnormal accruals (an indication of earnings management) to be more

pronounced for firms that have less independent audit committees. The average top 300 Australian company board have majority (86.3%) independent directors on its audit committee (Benkel et al. 2006) for the period 2001 - 2003.

### **Audit Committee Meetings**

This variable represents the number of audit committee meetings held in a period. Previous studies have used this as part of an audit committee effectiveness measure (Menon & Williams, 1994; DeZoort et al. 2002). It seems that audit committees that meet more often has reduced likelihood of fraud (Beasley et al. 1999; Farber, 2005) and are also less likely to experience financial reporting issues (McMullen and Raghunandan, 1996). Audit committees that meet more frequently should have a better chance of identifying misstatements and other financial statement issues. As such a “busy” audit committee should be more effective in performing its duties and should contribute to better quality financial statements.

### **Diversity**

This measure relates to the gender composition of the board and specifically identifies the number of female directors. Diversity is an important consideration since it results in a broader pool of opinions, experiences and backgrounds for decision making (Singh et al. 2002). Studies (Carter et al. 2003; Adams & Ferreira, 2003) have traditionally included either the number of women or minority group directors on the board<sup>8</sup>. A positive relationship exists between percentage of women on the board and firm value as measured by Tobin's Q (Carter et al. 2003; Adams & Ferreira, 2003). This study employs the number of female directors as a measure of diversity. Australia appears to be behind other comparable economies in employing women to the board of directors (Fox, 2007), studies show approximately 10.37% of Australian directors are female (Kang et al. 2007). US evidence show that the percentages of women on boards are slowly increasing (Farell & Hersch, 2005, Daily et al. 1999). Since the majority of studies find diversity of the board a positive attribute, this study takes a similar view.

### **Remuneration Committee Size**

The remuneration committee have a responsibility to shareholders to ensure executive pay is fair and appropriate and that it attracts and retains suitable qualified individuals to the firm. The ASX GCG requires this committee to have at least three members. It is necessary to have sufficient members to overcome any bias or agenda of individual members. This is especially important when deciding the terms and conditions of employment for senior management and the CEO. This study views a larger

remuneration committee as beneficial to good governance.

### **Remuneration Committee Meetings**

Remuneration committees periodically review the employment terms and conditions of senior management and CEO's remuneration. A recent study of top 100 Australian firms found that 98% of these firms had a remuneration committee in 2005 (Mallin, 2006)<sup>9</sup>. Studies show that remuneration committee meetings occur (in some instances) more frequently than audit committee meetings (Spira & Bender, 2004) and ensures compensation is adequate to retain executives (Higgs, 2003). As with the audit committee and the board, a remuneration committee that meets more frequently should be better equipped to perform its role efficiently and so should contribute to better governance.

### **Nomination Committee Meetings**

The role of the nomination committee is to identify potential candidates to fill board positions. In addition, they are also responsible for reviewing board performance. Since the board acts in a monitoring capacity, it is essential that potential new directors be qualified for the job at hand. The nominating committee is therefore crucial to ensuring the board remains balanced and independent. A recent study shows that 83% of top 100 Australian firms have a nomination committee (Mallin, 2006)<sup>10</sup>. There is little evidence on the benefits of an active nomination committee. Uzun et al. (2004) find, surprisingly, that firms with a nomination committee are more likely to experience fraud. Their study measures whether a nomination committee exists rather than its activity. Even so the ASX GCG (2003) recommends that nomination committees should meet regularly enough to be conducive to decision making<sup>12</sup>. An active nomination committee (one that meets regularly) would seemingly ensure that suitable board members are found and non-performing members addressed. As such, more frequent meetings should contribute to good governance.

The 11 variables just discussed will now be included in an exploratory principal component analysis as the first step in developing a weighted internal corporate governance measure for the Australian environment. The data and sample selection is discussed next.

### **Data and Sample**

Our proposed index is operationalised through its application to a sample of 400 listed Australian companies for the period 1999 – 2006. The governance data is hand collected from firm financial statements (obtained from Connect4 and DatAnalysis) whilst industry, size and other information for control variables are obtained from Aspect Financial

Analysis. The sample selection process commenced with the top 500 ASX listed companies by market capitalisation for each year over the period 1999 – 2006. If a firm delists or list within the period, its data is included as long as it remains listed. We then match the remaining companies in the governance dataset to that of the Aspect Financial Analysis Dataset. This left a final sample of 450 firms. 54% of the sample is Top 300 ASX listed firms (either in the first or last sample year). The remaining 46% are smaller firms, outside the Top 300.

### Internal Governance Index: Methodology

We employ Principal Component Analysis (PCA) to develop our internal governance index. PCA is a statistical data reduction technique that identifies related variables within a dataset load these on components. The result is a number of components that each includes variables measuring similar concepts and combined capture a significant part of the variance in the original dataset. PCA helps to overcome many problems associated with previous efforts to calculate governance scores (Gompers et al. 2003, Larcker et al. 2007). It considers variable

correlations and weights them to their component scores (they are thus not included with equal weights). Principal component analysis is commonly used in governance and finance research to determine representative measures for constructs (Tetlock, 2007; Banker & Mashruwala, 2007; Larcker *et al.* 2007).

We include 11 variables (board size independence and meetings, gray directors, audit committee size independence and meetings, nomination committee meetings, remuneration committee size and meetings and diversity) empirically found to be associated with improved reporting quality, reduced incidences of fraud or otherwise related to good governance (see table 2). As shown in table 3, the average Australian board of directors within the sample has 5.9 members. This is lower than the 9 reported by Mallin (2006). The difference may reflect that the latter's sample included only the top 100 firms. It appears that almost half of Australian boards are independent and that the average board meets approximately 10.5 times a year. Table 3 also presents descriptive on the board committees.

**Table 3**

Descriptive Statistics for governance variables in PCA

	Mean	Minimum	Maximum	Std. Deviation
BSIZE	5.917	1.000	17.000	2.241
BINDEP	.467	.000	1.000	.261
BMEET	10.547	1.000	41.000	4.262
GRAY	.236	.000	1.000	.239
ASIZE	2.621	.000	8.000	1.473
AINDEP	.562	.000	1.000	.386
AMEET	2.802	.000	22.000	2.178
NMEET	.243	.000	9.000	.820
RMEET	1.609	.000	10.000	1.842
RSIZE	1.474	.000	15.000	1.903
DIV	.182	.000	3.000	.480

Where *BSIZE* = board size, *BINDEP* = percentage independent directors on the board, *BMEET* = number of board meetings, *GRAY* = percentage gray directors, *ASIZE* = audit committee size, *AINDEP* = percentage of independent directors on the audit committee, *AMEET* = audit committee meetings, *NMEET* = number of nomination committee meetings, *RMEET* = remuneration committee Meetings, *RSIZE* = remuneration committee size, *DIV* = diversity (number of women on the board).

There are no individual correlations between our PCA governance variables larger than 0.73 (see table 4). In any case, principal component analysis considers such correlations when determining its components<sup>11</sup>. From the original 11 variables (table 2), PCA also identifies that the board meeting should be excluded due to low sampling adequacy (0.4). In addition the nomination committee meetings and diversity variables are excluded since neither load on either of the two components with Eigen values >1.

The final PCA then includes the remaining eight variables. They each have a Kaiser Myer Olkin (KMO) score > 0.5 and none appear to have a complex structure. The overall sampling adequacy measure (KMO) is 0.829 and the Bartlett's test of Sphericity is significant indicating our model is appropriate for PCA. The results (see table 5 top panel) show our Board Activity and Board Independence components that together explain 68.22% of the variance in the governance variables.

The Board Activity component includes 5 variables (remuneration committee size and meetings, audit committee size and meetings and board size) whilst Board Independence has three (gray directors, board and audit committee independence). The two factors from PCA (Board Activity and Board Independence –table 5 panel A) and their associated variables (table 5 panel B) measure two distinct components of internal corporate governance. An

assessment of the variable loadings (panel B table 5) indicate these relate to board activity and board independence respectively and are thus named as such. As predicted, gray directors (directors who are non-executives but are not independent) have a negative loading, which indicates that a larger percentage of gray directors contribute negatively to good governance.

**Table 4**  
Correlation coefficient for governance variables in PCA

	BSIZE	BINDEP	BMEET	GRAY	ASIZE	AINDEP	AMEET	NMEET	RMEET	RSIZE	DIV
BSIZE		0.368**	0.136**	-0.100**	0.550**	0.432**	0.563**	0.231**	0.433**	0.519**	0.261**
	0	0	0	0	0	0	0	0	0	0	0
BINDEP	0.343**		0.126**	-0.710**	0.349**	0.732**	0.376**	0.165**	0.238**	0.377**	0.167**
	0	0	0	0	0	0	0	0	0	0	0
BMEET	0.069**	0.115**		-0.061**	0.200**	0.176**	0.284**	0.063**	0.198**	0.245**	0.002
	0	0	0	0.001	0	0	0	0	0	0	0.917
GRAY	-0.129**	-0.720**	-0.072**		-0.106**	-0.559**	-0.146**	-0.096**	-0.069**	-0.178**	-0.069**
	0	0	0	0	0	0	0	0	0	0	0
ASIZE	0.515**	0.367**	0.184**	-0.145**		0.444**	0.598**	0.244**	0.412**	0.462**	0.086**
	0	0	0	0	0	0	0	0	0	0	0
AINDEP	0.403**	0.734**	0.161**	-0.557**	0.535**		0.500**	0.171**	0.317**	0.422**	0.083**
	0	0	0	0	0	0	0	0	0	0	0
AMEET	0.502**	0.340**	0.243**	-0.142**	0.565**	0.471**		0.284**	0.439**	0.594**	0.116**
	0	0	0	0	0	0	0	0	0	0	0
NMEET	0.257**	0.160**	0.034	-0.096**	0.200**	0.166**	0.292**		0.243**	0.344**	0.048*
	0	0	0.075	0	0	0	0	0	0	0	0.015
RMEET	0.414**	0.253**	0.169**	-0.100**	0.409**	0.327**	0.381**	0.214**		0.700**	0.109**
	0	0	0	0	0	0	0	0	0	0	0
RSIZE	0.460**	0.335**	0.190**	-0.163**	0.400**	0.362**	0.521**	0.343**	0.571**		0.168**
	0	0	0	0	0	0	0	0	0	0	0
DIV	0.274**	0.169**	-0.007	-0.077**	0.078**	0.073**	0.104**	0.111**	0.107**	0.186**	
	0	0	0.718	0	0	0	0	0	0	0	0

Spearman correlations are reported above the diagonal. Pearson correlations are reported below the diagonal. The first line represents correlation coefficient whilst the second line reports p-value. Where *BSIZE* = board size, *BINDEP* = percentage independent directors on the board, *BMEET* = number of board meetings, *GRAY* = percentage gray directors, *ASIZE* = audit committee size, *AINDEP* = percentage of independent directors on the audit committee, *AMEET* = audit committee meetings, *NMEET* = number of nomination committee meetings, *RMEET* = remuneration committee Meetings, *RSIZE* = remuneration committee size, *DIV* = diversity (number of women on the board).

The PCA results (see table 5 panel A) show that the two components – denoted Board Activity (38.809%) with 5 variables (remuneration committee size and meetings, audit committee size and meetings and board size) and Board Independence (29.408%) with 3 variables (gray directors, board and audit committee independence) explain 68.218% of the variance in the governance variables. The Board Activity component in essence includes variables that measure how active the board committees are and whether they are of a sufficient size to be conducive

to decision making (more than 3 members per the ASX GCG, 2003). The finding that Board Activity is such an important component (contributes 38.8%) in internal governance is consistent with the theoretical view that the mere existence of board committees won't achieve much; these committees need to meet frequently enough to contribute to good internal controls and decision making (Abbott et al. 2000). Similarly there is also substantial evidence that independent boards and audit committees reduces the incidence of misappropriation (Abbott et al. 2000).

**Table 5**

Component loadings from PCA

PANEL A Component	% of Variance (component load)	Cumulative %	Weight out of 100
Board Activity	38.809	38.809	57%
Board Independence	29.408	68.218	43%
Component constituents (variables) from PCA with variable weights			
PANEL B Variables			
		Board Activity variable weights	Board Independence variable weights
RSIZE		0.771	.
AMEET		0.765	.
BSIZE		0.749	.
RMEET		0.739	.
ASIZE		0.73	.
GRAY		.	-0.911
BINDEP		.	0.883
AINDEP		.	0.756
PCA Procedure: Varimax rotation with Kaiser Normalization			

Where RSIZE is remuneration committee size, AMEET is number of audit committee meetings, BSIZE is board size, RMEET is remuneration committee size, RMEET is remuneration committee meetings, ASIZE is audit committee size, GRAY is percentage gray directors on the board and BINDEP and AINDEP is the independence of the board and audit committee as a percentage.

Component scores are calculated as follows: First the variable weights (panel B, table 5) are multiplied by the observed values for each variable in the component; these are then summed. This yields a component score for each of our two components, Board Activity and Board Independence. Next the component loadings (the 38.809% for Board Activity and 29.408% for Board Independence) are reverted to percentages out of 100 using 68.218 as a base. This establishes the weight of each component (Board Activity and Board Independence) in the index (i.e.

57% for Board Activity and 43% for Board Independence).

The internal governance score (IGS) is calculated as sum of the component scores multiplied by the adjusted component weight (out of 100). This method of index compilation from PCA is commonly used and considered to be the most reasonable since the first component (Board Activity) from PCA contributes most to explaining the variables (Schmidlein et al. 2008).

**Table 6**

Example of calculation of Internal Governance Score

Component	Variables in Component	Firm observed value	Variable Weight from PCA	IGS Score
Board Activity				
	RSIZE	3	0.771	
	AMEET	2	0.765	
	BSIZE	5	0.749	
	RMEET	1	0.739	
	ASIZE	3	0.73	
Total Board Activity Score			10.52	
=Σ (firm obs value * variable weight)				

Weighted with PCA weight			10.52* 57% =	6.00
Board Independence				
	GRAY	20%	-0.911	
	BINDEP	80%	0.883	
	AINDEP	85%	0.756	
Total Board Independence Score			1.17	
= $\Sigma$ (firm obs value * variable weight)				
Weighted with PCA weight			1.17 * 43%	0.5
Total IGS SCORE				6.5

Where RSIZE is remuneration committee size, AMEET is number of audit committee meetings, BSIZE is board size, RMEET is remuneration committee size, RMEET is remuneration committee meetings, ASIZE is audit committee size, GRAY is percentage gray directors and BINDEP and AINDEP is the independence of the board and audit committee as a percentage.

For example, as indicated in table 6, for a firm with the observed variable values indicated in the third column, each observed value is multiplied by the variable weights (column 4) and the result summed (total for component is 10.52). Then this component score is adjusted with the component weight from table 5 (10.52 \* 57%) to yield the weighted component score (6). This is repeated for the second component (0.5) so that the combined of these two values is the internal governance score (6.5).

The PCA thus not only identifies the two governance components (board activity and board independence), but also helps calculate a weighted internal governance score. This improves on previous efforts since anti-takeover measures are excluded. The PCA also overcomes the “arbitrary index” problem of naively selecting binary variables on an equal weight basis as well as considering variable correlations. We adhere to the methodological requirements of PCA and the results are well within our expectations, improving on Larcker et al. (2007). The mean governance score is 5.815 with a maximum and minimum of 9.95 and 0.95 respectively. The internal consistency reliability of the index is confirmed by calculating the Cronbach Alpha (Cronbach, 1951) value. We find alpha to be 0.768 which is above the accepted level of 0.7 (Cronbach, 1951). It therefore appears as if the IGS is a reliable measure. As this score is derived from Australian data, it should also be a potentially better measure when investigating firm governance in this country. The score provides insight on those internal governance characteristics that are most important (its components), activity and composition of board committees and independence. Firms that have these characteristics of good governance should therefore experience less agency problems (and costs).

### Conclusion

This study used exploratory principal component analysis (PCA) to develop a weighted internal

governance score. 11 Internal governance variables (empirically found to be indicative of good internal governance) are included in the PCA. The results indicate that the internal governance construct has two components (Board Activity and Board Independence) that include 8 variables between them. These are combined to develop and calculate a weighted internal governance score for each firm in our sample.

This study contributes to the extant literature in several ways. First the internal governance score developed overcomes many problems associated with previous US based efforts. The use of principal component analysis helps compute a weighted score that does not assume all governance factors are equally important and that considers correlations between variables. Anti-takeover provisions are excluded since have been found to reduce firm value (Larcker et al. 2007). Second, the index is created specifically for the Australian environment and is the first such effort to date<sup>12</sup>. Finally by incorporating a sample size of 450 Australian firms, this study can provide much better information on the governance characteristics of Australian firms. A similar approach could be employed for US data to overcome difficulties with previous index efforts.

The creation of a weighted internal corporate governance index designed for the Australian environment has many of implications for firms, investors and regulators. It would seem that firms who want to minimise agency problems (and costs) should ensure their board committees meet regularly and consist of enough independent members to be conducive for decision making. For firms, there is now a straight forward basis on which to compare their governance standards with those of competitors as well as against prior years. For investors, they can now easily identify which firms are better governed and incorporate this factor in the share selection process as well as lobby for further improvements. In addition, for investors worried about monitoring and other agency costs it appears that investing in firms with high internal governance scores (and active independent board committees) should reduce the

incidence of such costs. Finally, for regulators, the index should allow them to monitor the direct impact

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quality pre and post reforms and the differences in governance quality that exist between different industries.

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\* We would like to thank participants at the AFAANZ Annual conference in Sydney, 2008 and PBFEM conference in Brisbane, 2008 for comments on part of this paper. Additional thanks to FIRN for scholarship support to attend informative events that have improved this paper.

<sup>1</sup> ASX GCG 2003 refers to the ASX Principals of Good Corporate Governance released in 2003. These provide significant recommendations for governance reforms. CLERP 9 is the Corporations Law Economic Reform Program and was officially instated in 2004.

<sup>2</sup> External governance provisions (anti-takeover provisions, shareholders activism etc.) are considered to reduce firm value (Larcker et al. 2007) and are driven mainly by country laws and institutions, cultural norms and other monitors (Cremers & Nair, 2005).

<sup>3</sup> They do not follow methodological guidelines such as the minimum required value for communalities between variables as  $>0.5$ . In addition they include dummy variables in their PCA – problematic since an assumption of PCA is that variables are continuous.

<sup>4</sup> Whilst this is true for academic studies, a commercial provider releases the Horwath rankings. These have been released annually from 2002 for a limited number of large ASX firms. As the publishers (University of Newcastle) do not reveal how their rankings are calculated, it is difficult to determine what exactly it measures.

<sup>5</sup> See Gertner & Kaplan, 1996; Wu, 2000; Coles et al. 2008, Yermack, 1996 for evidence.

<sup>6</sup> A requirement exists to have at least 3 directors on the audit, remuneration and nomination committees. As such it implies that the board needs to have at least 3 directors.

<sup>7</sup> Kang et al. (2007) similarly find an average of 76.46% independent directors on the board for the top 100 listed Australian firms in 2003.

<sup>8</sup> In contrast to the US, ethnicity of directors is not available in Australia. As such we employ the number of female directors.

<sup>9</sup> Whilst the ASX GCG recommends at least 3 directors on the committee, if a firm chooses not to comply it need only state why. As such not all Australian firms will have this.

<sup>10</sup> The ASX GCG recommends firms to have a nomination committee with at least 3 members. If firms choose not to comply, they only need to state why. As such not all firms have nomination committees.

<sup>11</sup> Spearman and Pearson Correlation values are commonly employed to determine the interrelationship amongst variables included in studies (Larcker et al. 2007; Drake et al. 2007). To be consistent and thorough we include both.

<sup>12</sup> Whilst this paper is concerned with the rationale and structure of a weighted internal corporate governance index for Australia, the index has since been applied to examine this issue in more detail first on the changes in governance