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Board composition as the outcome of an internal bargaining process: empirical evidence

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Abstract

The traditional financial economics view of the determinants of board composition is based on outside shareholders' demand for external monitoring of management. In comparison, Hermalin and Weisbach (American Economic Review, 88 (1998) 96) model board composition as the outcome of a bargaining process between the CEO and the rest of the board. The model predicts, inter alia, that the bargaining power of the CEO relative to the rest of the board of directors will determine the level of independence of the board and the extent of board monitoring. This study tests Hermalin and Weisbach's model using a random sample of companies that are subject to limited regulatory constraints in relation to board composition and a common set of corporations regulations that may indirectly affect board composition. There is strong evidence that representation by outside directors varies inversely with CEO bargaining power, which is proxied by CEO tenure and inside shareholdings. An extension of the argument of Hermalin and Weisbach to board leadership is also tested. The results indicate that the appointment of the chairman of the board is also the outcome of a bargaining process between the CEO and the rest of the board with more powerful CEOs likely to hold the position of Chairman of the board. Together, these results suggest that more "powerful" CEOs are relatively entrenched and face fewer constraints and less monitoring than other CEOs. This evidence has potential relevance to current debates in relation to the need to control the number or proportion of outside directors.

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1. Introduction

There has been continuing controversy as to whether existing corporate governance mechanisms provide adequate safeguards for investors' capital. In particular, board composition (i.e., the proportion of outside directors) has been the focus of attention of investment funds (e.g., CalPERS, 1998),[1] stock exchanges, professional bodies, corporate governance taskforces, corporate governance critics and researchers.

The 1997 amendments to the NASDAQ listing rules had the effect of requiring that NASDAQ most listed companies maintain a minimum of three outside directors. In addition, CalPERS has increased the pressure on US companies to adopt certain corporate governance practices which it dubs "fundamental principles" including a standard that the majority of the board seats be held by outside directors. CalPERS also developed a set of "ideal principles" which it announced it may use to "grade" companies in the future, including the proposed principle that no executives other than the CEO should be members of the board of directors (Lublin, 1997).

Underlying these proposals is the concern expressed by some that too much power resides with the CEO and/or management. In particular, it has been argued that a director's appointment and its continuance is at least partly determined by the CEO (Mace, 1986; Lorsch and MacIver, 1989) leading to calls for regulatory or procedural reforms (e.g., Tosi et al., 1991; Latham, 1997).[2] Yet, there is evidence that indicates that board composition varies with both firm specific factors and the regulatory environment that the firm faces.[3] This leads to the concern that imposing a "one size fits all" model may increase costs for those companies that may be forced to depart from corporate governance practices which have been successful.

Prior empirical research has generally applied either agency theory (e.g., Beatty and Zajac, 1994) or strategic contingency models to develop hypotheses in relation to the economic determinants of board composition. Explanations based on agency theory typically rely on efficiency arguments and the notion that governance structures serve to reduce agency costs. Evidence indicates that variations in governance structures between firms are explained, at least in part, by firm specific factors. The outcomes are interpreted as efficient contracting solutions that reduce agency costs. Strategic contingency models (e.g., Pearce and Zahra, 1992)

[1] Californian Public Employees' Retirement System.

[2] The influence of the CEO on the appointment of directors appears to vary with firms' governance procedures. Shivdasani and Yermack (1999) provide evidence that where there is no nominating committee and where the CEO serves on the nominating committee, firms appoint less independent directors and more gray directors.

[3] Arthur et al. (1993), Arthur and Taylor (1995), Bathala and Rao (1995), Brickley and James (1987), Denis and Denis (1994), Hermalin and Weisbach (1988).

examine the association between factors that are perceived by researchers to determine the success or failure of companies and the composition of the boards of directors.

In contrast, the more recent model of Hermalin and Weisbach (1998) provides an alternate view of the determinants of board composition. In this model, board composition is the outcome of an internal bargaining process between the CEO and the rest of the board. Board composition thus depends on the bargaining power of the CEO relative to the rest of the board.

This study provides a test of the empirical implications of Hermalin and Weisbach's model. Specifically, that board composition will vary with the bargaining ability of the CEO and the degree of uncertainty with respect to his/her ability. I control for other potential determinants of board composition including firm size, leverage, diversification and asset composition.

The second focus in this study is the relationship between inside ownership and board composition. The existing literature is based on a simple linear model and an assumption that the demand for monitoring by outside directors will be strictly declining with managerial ownership due to the effects of alignment of interests of management and outside shareholders. In contrast, it is argued in this paper that the relationship between representation by outside directors and managerial ownership will be non-linear, due to the dual effects of managerial ownership on both incentive alignment and management entrenchment.

The main results of this study are as follows. CEO bargaining power is strongly associated with both the proportion of inside directors and unitary leadership. These results imply that more powerful CEOs face lower levels of monitoring and less independent boards. It thus provides support for the model developed by Hermalin and Weisbach and the argument that any externally imposed constraints on board composition are likely to be ineffective where insiders potentially determine the selection of "outsiders".

Further, using a piece-wise regression approach, I find evidence of a non-linear relationship between inside ownership and board composition. A negative relationship between the proportion of outside directors and inside ownership is evident for "low" (0–10%) levels of inside ownership, consistent with the effects of an increasing alignment of interests between management and outside shareholders and a decreased demand for monitoring by outside directors. In addition, there is evidence of a negative relationship between inside ownership and the proportion of outside directors for "high" (20–100%) levels of ownership interest indicating potential managerial entrenchment through control of voting rights.

These results are potentially important in the context of research that examines the relationship between inside ownership and firm value. It indicates that potential conflicts of interests between management and outside shareholders may be mitigated by adaptations to corporate governance structures.

The remainder of this paper is organized as follows. Section 2 contains the hypothesis development and Section 3 contains the sample description and vari-

able definitions. The results are contained in Section 4. A summary and conclusion is contained in Section 5.

2. Agency and bargaining explanations for board composition

2.1. Prior research

Much of the existing literature examines board composition from an agency cost perspective and argues that representation by outside directors will increase with the conflicts of interests between management and outside shareholders. Based on Jensen and Meckling's (1976) model, it has been argued that the optimal level of monitoring increases as managers' share of the firm declines and increases with firm size. Evidence consistent with this model is provided by Weisbach (1988) who reports that the fraction of non-executive directors on the board is negatively related to the proportion of equity held by insiders. Further, Pincus et al. (1989) and Pearce and Zahra (1992) report that larger firms have, on average, larger boards and a greater proportion of outsiders on the board.[4] However, whether the negative relationship between inside shareholdings and the proportion of outside directors can be attributed to the incentives facing management is difficult to determine as inside ownership may be related to other factors such as the investment opportunity set or even managerial entrenchment. Similarly, firm size may be a proxy for factors other than complexity, including industry membership or a company's political sensitivity.

There is also evidence that board composition reflects, in part, the ease with which outside shareholders are able to monitor management. Pearce and Zahra (1992) argue that high levels of uncertainty relating to the factors that are important to the success of the organization imply increased difficulty for outside shareholders in monitoring the effects of managerial actions on firm value. They document that when environmental uncertainty is high, there is increased reliance on outside directors to monitor management.

In addition to outside directors, the market for corporate control, large block-holders, and the managerial labor market may provide monitoring and discipline of management. Existing evidence suggests that reliance on these mechanisms varies across firms and, consistent with Williamson (1983) there is substitution of control mechanisms. In particular, for US firms, state-based anti-takeover laws can reduce the probability of hostile takeover and impede the operation of the market for corporate control. Arthur and Taylor (1995) document that in states where anti-takeover laws are strongest (i.e., companies receive greater protection from

[4] Outside directors are a subset of non-executive directors. Typically, outside directors are defined so as to exclude retirees, relatives of management and directors with business ties to the company.

takeover), there is greater reliance on monitoring by outside directors as evidenced by a greater representation by outside directors.[5] An implication is that cross-sectional studies that use samples of US firms drawn from multiple states may produce spurious results if the decision on state of incorporation is related to firm specific factors.

2.2. Internal bargaining and board composition

Hermalin and Weisbach (1998) provide an alternative specification of the determinants of board composition. They analyze board composition as the outcome of bargaining between the CEO and other members of the board. The board first makes a decision as to whether to replace the CEO, then the CEO and the rest of the board bargain in relation to board composition. In this model, the bargaining power of the CEO, vis-a-vis the rest of the board determines the composition of the board and hence the extent of monitoring of the CEO.

For a number of reasons, the bargaining ability of the CEO relative to other directors is expected to increase with CEO tenure. A new CEO generally has a relatively low level of firm specific human capital, implying that substitutes are more widely available. In comparison, CEOs with longer tenure will have higher levels of specificity and consequently entrenchment, as they are more valuable to outside shareholders than alternate managers. Moreover, as the level of entrenchment of the CEO increases, dismissal costs increase, and the optimal level of monitoring declines. As a result, entrenched CEOs may obtain more latitude in running the company.[6]

Evidence supporting a relationship between CEO bargaining power and tenure is provided by Hill and Phan (1991) who report that as tenure grows, the relationships between CEO pay and firm size and CEO pay and firm risk become stronger, and the relationship between CEO pay and stock returns becomes weaker. Further evidence of an association between CEO tenure and CEO is provided by Kim (1996) who reports that, for a given level of performance, the likelihood of a forced turnover is lower for a CEO with more than 10 years of tenure than for a CEO with less than 10 years of tenure.

The level of monitoring of a new CEO by the board is also expected to be higher due to greater levels of uncertainty regarding the ability of a newly appointed CEO relative to an established CEO. The board generally knows the ability of a CEO having longer tenure with greater precision relative to that of a

[5] Brickley and James (1987) also find a relationship between the proportion of outside directors and the classification of the level of protection from takeover for US banks. However, the results are not in the hypothesized direction. This may be at least partly be attributed to the (then) restrictive rules relating to interstate banking.

[6] Shleifer and Vishny (1989) also conclude that managers with high levels of specificity will face lower levels of monitoring.

newly appointed CEO as it may take several years for the degree of success of a CEO's initiatives, including new programs, investments and divestitures to be established.

The "agency" and "internal bargaining" explanations for board composition are not considered mutually exclusive. In the bargaining process, the optimal level of monitoring by outside directors as perceived by the incumbent directors may vary with factors such as the size and complexity of the firm. Consequently, in testing the proposition that the bargaining position of the CEO vis-a-vis the rest of the board determines board composition, this study controls for the "agency" variables (such as firm size) which may also be potential determinants of board composition.

There is mixed evidence in relation to the association between CEO tenure and board composition for US companies. Bathala and Rao (1995) report a negative association between CEO tenure and the proportion of non-executive directors. In contrast, Whidbee's (1997) study of board composition in the US banking industry reports no relationship between CEO tenure and the proportion of either outside or non-executive directors. The use of a banking industry sample by Whidbee is in contrast to the majority of studies of board composition, which specifically exclude companies in the banking industry as part of the sample selection process. A feature of each of these studies is the failure to control for variations in corporations legislation that may influence board composition in the manner described above. This is particularly true where the samples comprise companies incorporated in different US states and is exacerbated by the use of pooled data.

Specific regulatory constraints that operate in the banking industry potentially affect corporate governance and hence the ability to draw inferences in relation to companies that operate in other industries. In particular, several factors constrain the selection of directors in the banking industry (Subrahmanyam et al., 1997). There are requirements in relation to the residence of directors (in some US states, directors must reside in the state where the bank is licensed) and restrictions on the ability of directors to serve on the board of more than one bank. Banks are also subject to prudential controls that are accompanied by monitoring and constraints on investment and financial decisions. Existing evidence indicates that board composition and ownership structure of banks differ from that of non-financial firms (Murthy et al., 1993). Further, banking law increases director responsibilities in relation to "duty of care" and "duty of loyalty" (Fischer, 1992). Together, these factors suggest that it is doubtful as to whether we can generalize Whidbee's results from banks to other types of companies.

The above discussion leads to the following hypothesis.

H1. Representation by outside directors will decrease as CEO tenure increases.

The model of Hermalin and Weisbach can be extended to the determinants of board leadership. This represents an extension of the sequence of events consid-

ered above in the analysis of the determinants of board composition. The board first makes a decision as to whether to retain the CEO, then there is bargaining in relation to board composition, followed by internal bargaining by the board itself in relation to leadership.

The "Constitution" (or Articles) of a company generally provide that the directors of a company elect one of the directors as chairman and determine the period of office. Duality (the combination of the positions of CEO and Chairman) is expected where the CEO possesses greater bargaining power, relative to the other directors.[7,8] As bargaining power is expected to increase with tenure, the following relationship between CEO tenure and board leadership is predicted.

H2. Firms with dual leadership will have higher CEO tenure than firms without dual leadership.

The level of representation by outside directors may also vary with the bargaining position of management as a team. Increased levels of inside ownership and hence voting rights may provide managers with greater bargaining ability and fewer constraints (i.e., managerial entrenchment). Agency theory also predicts that as the level of management shareholding increases, the optimal level of monitoring decreases due the alignment of interests of managers and outside shareholders.

Evidence of the dual effects of inside ownership on both the alignment of interests of management and outside shareholders and managerial entrenchment has been documented in the financial economics literature. Several studies have reported a non-linear relationship between inside ownership and firm value (e.g., Morck et al., 1988; McConnell and Servaes, 1990).[9]

Despite this evidence, prior research on board composition implicitly assumes that the agency costs of management/shareholder contracting is strictly decreasing with management ownership.[10] The evidence that the fraction of outsiders on the

[7] There is some inconsistency in the use of the terms "unitary" and "dual" leadership. Some authors (e.g., Donaldson and Davis, 1991) have used the term "dual" leadership to refer to the case where the titles of CEO and Chairperson are vested in the same individual.

[8] An alternative argument is provided by (Finkelstein and D'Aveni, 1994) who believe that duality is the preferred model in cases where the CEO possesses substantial informal power as it may be advantageous to have a single and unambiguous source of command with the board providing an oversight role. As information asymmetry may also increase with tenure, this would also lead to a predicted positive relationship between CEO tenure and board leadership.

[9] This evidence is less than conclusive as market to book ratios measure more than how well a firm is managed.

[10] For example, Beatty and Zajac hypothesize that "…the smaller the equity stakes held by top managers, the greater levels of firm monitoring, as represented by a larger proportion of outside directors".

board is negatively related to the shareholdings of the top two officers (Weisbach, 1988; Hermalin and Weisbach, 1988) and the CEO (Whidbee, 1997) is ambiguous as it could be consistent with either an alignment of interests or managerial entrenchment (or both).

If both alignment and entrenchment effects exist, any relationship between inside ownership and board composition is expected to exist for the restricted range of managerial ownership. Where managerial ownership is low, alignment effects are expected to apply. Alignment effects imply that increasing levels of inside ownership will be associated with a decrease in the demand for monitoring and hence a smaller proportion of outsiders on the board.

Thus, the following hypothesis runs.

H3(a). At low levels of managerial ownership, representation by outside directors will be inversely related to managerial ownership interest.

The agency costs that arise due to high levels of managerial ownership are more difficult to control by employing outside directors. As managerial equity interest increases, their voting power also increases, suggesting that management may be able to control director appointments and removals. Hence, high levels of managerial ownership are expected to be associated with increased representation by executive and "gray" directors.[11]

This leads to the following.

H3(b). At high levels of managerial ownership, representation by outside directors will be inversely related to managerial ownership interest.

The selection of the Chairman is also expected to be related to inside ownership and asset composition. Fama and Jensen (1983) argue that when specific knowledge is concentrated among a small number of individuals, it is efficient to consolidate decision management and decision control in the hands of the same individuals. The extent of information asymmetries is expected to be related to the investment opportunity set (Clinch, 1991; Smith and Watts, 1992), implying that firms whose value is principally comprised of "growth options" are likely to have dual leadership reflecting a concentration of decision rights and decision control.

[11] Gray directors are non-executive directors who may not be independent due to family or financial ties with current management (e.g., relatives of executive directors, directors who provide consulting services to the company and directors who are partners of legal or accounting firms that provide professional services to the company).

2.3. The investment opportunity set, inside ownership and board composition

There is mixed evidence as to whether representation by outside directors varies with its investment opportunity set. Smith and Watts (1992, p.275) argue that:

> ...manager's actions are less readily observable if the firm has more investment opportunities. It is difficult for shareholders *or outside board members* who do not have managers' specific knowledge to observe all the investments from which the manager chooses. (Emphasis added)

This suggests a negative relationship between the value of a firm's investment opportunities (relative to its assets-in-place) and representation by outside directors. Evidence on this issue is equivocal as Bathala and Rao (1995) find evidence of a negative relationship between market to book assets and the proportion of non-executive directors. In contrast, Whidbee (1997) finds no evidence of a relationship between market to book assets and representation by outside directors for a sample of firms in the banking industry. These inconsistent results may arise due to the dominance of regulatory effects for banking companies, which may imply a slightly different role for outside directors for companies in the banking industry.

It is important to jointly consider ownership and the investment opportunity set as optimal ownership concentration may vary with the investment opportunity set (Demsetz and Lehn, 1985). Companies with more growth opportunities are expected to concentrate decision rights and claims against the firm's cash flows in the hands of managers to provide incentives for the proper management of intangible assets.

Firms with more growth opportunities vis-a-vis assets-in-place also tend to have lower debt to equity ratios (Smith and Watts, 1992) and hence less monitoring by lenders. Concentration of decision rights and cash flow ownership is one means to reduce the agency costs of growth opportunities and is evident in the observed relation between ownership structure and Tobin's *Q*.

By aligning managers' and outside shareholders incentives through inside equity ownership, firms with more growth opportunities may thus reduce the costs of managerial discretion, which permits lower levels of monitoring. An interrelationship between the relative value of managerial ownership and growth opportunities is therefore expected.

H4. Firms with valuable growth opportunities and higher levels of inside ownership will place lower reliance on monitoring by outside directors.

2.4. Control variables

The control variables used in the multivariate analysis are proxies for firm size, financial structure, free cash flow, diversification and the presence of a majority

shareholder. The reasons for inclusion of each of these control variables are discussed below.

Firm size is included as a control variable as evidence suggests that the boards of larger firms have a higher proportion of outside directors (Brickley and James, 1987; Pearce and Zahra, 1992; Pincus et al., 1989). This relationship may however be spurious as firm size may be correlated with other omitted variables such as asset composition or financial structure. Pearce and Zahra (1992) report that financial leverage is positively related to representation by outside directors, which they suggest arises as lenders insist on board representation as financial risk increases.

Diversification is included as a control variable as corporate groups with several business segments and/or operating in different geographic locations may be more difficult (and costly) for outside shareholders to monitor. In particular, the usefulness of consolidated accounts as a monitoring device is reduced when a corporate group operates in a number of industries and/or geographic areas. Cross-sectional comparability of performance is more difficult for diversified groups compared to those operating in one line of business due partly to the diversity of in the ways in which industry and geographic segments are defined for reporting purposes. In addition, to the extent that segments are integrated, transfer pricing can affect the reported results of individual segments. Outside directors may also be relied upon to provide expertise that may not be available within the firm such as the management of a diversified portfolio of assets or providing access to external capital markets. Hence, the extent of industry and geographic diversification are included as control variables.

The level of free cash flow may also create an increased demand for outside directors. In particular, outside shareholders level of concern with respect to dividend and investment policy is expected to be greater where a company is generating large cash flows and has limited growth opportunities.

Large shareholders can also play a governance role. The financial incentives to monitor management increase with the value of the shareholding. In addition, large shareholders are often able to influence (if not control) the financial and operating policy of the company reducing the power of management. The presence of a large shareholder also increases the probability that the firm will be taken over and the potential role of the market for corporate control (Shivdasani, 1993). Existing evidence suggests that the number and proportion of outside directors is significantly lower for companies with a majority shareholder relative to firms with diffuse ownership (Denis and Denis, 1994).[12] Whilst Denis and Denis do not control for other factors (such as CEO tenure and inside ownership) that may also be related to board composition, their evidence suggests that majority shareholders

[12] A majority shareholder is defined as an ownership interest of in excess of 50% of the share capital.

value "unilateral control" which may result from a smaller board, and a lower number of outsiders. Hence, in the multivariate analysis, I control for the presence of a majority shareholder.

3. Methodology, sample and proxies

3.1. Research method

In testing the hypotheses developed in Section 2, a cross-sectional approach is considered to be the simplest and most direct method to control for the effects of actual and impending regulatory changes which may affect board composition. This approach also minimizes the potential impact of changes in economic factors on measurement of the independent variables.

In cross-sectional tests, board composition as at 1989 is the dependent variable and firm characteristics identified in Section 2 at this date are the independent variables. The 1989 reporting period was selected based on the timing of Australian corporate governance initiatives and changes in financial statement disclosure requirements. This period precedes the date at which proposed changes in Australian Stock Exchange (ASX) listing requirements were first signaled and the date of issue of the first set of corporate governance recommendations of the task force established by a coalition of Australian professional organizations.[13] While the emergence of corporate governance issues in the public domain has been gradual, there was little regulatory (or quasi-regulatory) pressure on Australian board composition prior to 1990. In addition, the issuance of accounting standard AAS 22 *Related Party Disclosures* in June 1988 (Australian Accounting Standards Board, 1988) led to significantly increased disclosure of directors' transactions with the company and other entities in the group and facilitates the identification of outside directors.

The sample of 135 firms was obtained by drawing randomly from the population of approximately 750 ASX industrial firms as at June 30, 1989. Mining companies were excluded because of the disparate nature of their activities and the magnified problems in using historically based accounting data to measure performance and financial position.

Purely cross-sectional tests used elsewhere in the literature do not allow for potential lag relationships between firm characteristics and board composition. Directors of Australian listed companies do not have to submit themselves for

[13] The Bosch tack-force contained representatives from the Australian Institute of Company Directors, the Australian Merchant Bankers Association, the Australian Society of Certified Practicing Accountants, the ASX, the Business Council of Australia, the Institute of Chartered Accountants in Australia, the Law Council of Australia and the Securities Industry of Australia. This report recommended that boards of listed companies include a majority of non-executive directors.

re-election every year, implying that board composition may respond with some lag to changes in firm characteristics. Australian directors must submit themselves for re-election within 3 years of appointment and typically "staggered elections" are used to comply with this requirement. In order to examine whether such lagged relationships exist; board composition in 1989 is regressed against levels of the independent variables in 1987.

A final set of tests involves regressing changes in board composition against changes in firm characteristics. If board composition is a function of the variables identified in Section 2, changes in these variables should also be associated with changes in board composition. Data on board composition and firm characteristics as at 1993 was collected in order to examine this issue. The sample size for these tests is reduced to 77 companies due mainly to takeover and financial distress.[14]

3.2. Proxies

Outside directors are defined as all directors other than full-time executives of the sample company or any of its subsidiaries, directors with current business ties to the firm (including suppliers, advisers/consultants and customers), retirees and relatives of management. Information about the directors of each sample company was obtained from Annual Reports, the Australian Stock Exchange Research Handbook and Jobsons' Yearbook of Australian Companies. Except as noted below, data for each of the independent variables are collected from the consolidated financial statements.

CEO tenure (TENURE) is defined as the number of years that the CEO has been a member of the board of directors. In most cases, this also corresponds with the tenure as CEO. In cases where appointment to the board precedes the date of appointment as CEO, the period from appointment to the board is the preferred measure of "tenure" as the entrenchment and specificity of the manager are expected to vary with the period of employment. The number of years that the firm has employed the CEO (in any capacity) is not publicly available.

Directors' shareholding (DIR_SHARE) is measured as the total "relevant interest" in the ordinary share capital of the firm, adjusted where necessary to reflect interests held in common by more than one director. A relevant interest is defined to include shares held in trust for the director, shares which the director has contracted to buy, shares over which he/she has an option and shares held by companies which are controlled by the director, either alone or with associates. Inside directors' shareholding (INHOLD) is defined as the total shareholding of "executive" and "gray" directors.

[14] Sixteen companies (11.8%) were taken over, 15 (11.1%) delisted due to "failure to pay listing fees", 12 (8.9%) "by order of the ASX", 3 (2.2%) "at the request of the company" and 12 (8.9%) for a variety of other reasons.

Measurement of firms' asset composition is difficult due to the proprietary nature of information concerning many investment opportunities. This study uses market to book assets defined as ((market value of shareholders' equity + book value of debt)/total assets), MBA, to measure the investment opportunity set. Whilst other proxies for the investment opportunity set have been adopted, evidence suggests that investment opportunity set proxies are significantly correlated (Gaver and Gaver, 1993; Skinner, 1993). In sensitivity analysis, market to book equity, PE and the ratio of research and development to total assets are substituted for MBA.[15]

Free cash flow is cash flow in excess of that required to fund all positive net present value projects when discounted by the relevant cost of capital (Jensen, 1986). The approach used here is based on Opler and Titman's (1993) sample partitioning approach whereby firms with free cash flows are defined as firms with both "high" cash flows (measured as CFO/TA) and "low" growth opportunities (measured as MBA). An indicator variable is used, FCF, which takes on the value of 1 where both CFO/TA is above the median of all firms in the sample and MBA is below the median of all firms in the sample.

CFO is estimated by adjusting the operating profit before tax for taxation paid, the effects of accruals and the effects of transactions not included in the classification of cash flows from operations. CFO is defined as:

CFO = Operating profit before tax,
plus depreciation and amortization expense,
less (plus) gains (losses) on sale of assets,
less tax paid,
plus losses recorded on the write-down of assets,
plus (less) decrease (increase) in accounts receivable,
plus (less) increase (decrease) in accounts payable,
plus (less) decrease (increase) in inventory,
plus (less) decrease (increase) in prepayments.[16]

The extent of corporate diversification is measured using a count of the number of geographic (GEOGRAPHIC) and industry (INDUSTRY) segments, obtained from the reported segments in the financial statements footnote disclosures. As a general rule, Australian accounting standards require disclosure of material segments which are those with assets greater than 10% of total assets and/or profits greater than 10% of total profits.[17]

[15] PE is calculated only for firms with positive earnings ($n = 98$).

[16] For consistency, the same proxies are used to estimate cash flows for 1993 where cash flow disclosures are available.

[17] AASB 1005 *Financial Reporting by Segments*, paragraph (ix) (Australian Accounting Standards Board, 1986).

A dummy variable (MAJORITY) equals one for companies with a shareholder who owns more than 50% of the ordinary share capital and zero otherwise. SIZE is defined as the natural logarithm of total assets. Leverage (DEBT) is defined as total liabilities divided by shareholders' equity.

3.3. Descriptive statistics

Panel A of Table 1 summarizes the size and composition of the board for the sample firms. The median (and modal) number of directors is five and more than

Table 1
Board size, composition and control type
Summary statistics for board size and composition for 135 sample firms for the 1989 financial year.

A. Board size and composition

	Mean	Median	Minimum	Maximum	Std. deviation	Skewness
Number of directors[a]	5.56	5	3	13	2.03	1.03
Number of executive directors[b]	1.91	1	0	8	1.58	1.33
Proportion of non-executive directors	0.62	0.67	0	1	0.27	−0.83
Number of outside directors[c]	2.71	2	0	10	2.21	1.03
Proportion of outside directors	0.46	0.5	0	1	0.29	−0.17

B. Control type

	No. of companies	% of sample
Outside controlled		
≥ 0.6 outsiders	56	41.5
≥ 0.5 outsiders	70	51.9
Non-executive controlled		
≥ 0.6 non-executive	92	68.1
≥ 0.5 non-executive	94	69.6
Inside controlled		
≤ 0.4 outsiders	62	45.9
≤ 0.5 outsiders	77	57.0

[a] Excludes "alternate directors".

[b] Executive directors include all directors who are full-time employees of the company or any subsidiary.

[c] Directors are classified as outside if they: are not full-time employees; are not related to management; do not have business ties to the firm (e.g., supplier, consultant); are not retirees; do not owe money to the company; and are not current or former employees of the firm's legal counsel or auditors.

90% of sample firms have eight or fewer directors, the maximum recommended by Lipton and Lorsch (1992) and Jensen (1993). Australian boards are much smaller than those of United States listed companies.[18] Plausible causes of this difference are the statutory requirements in many US states which set the minimum board size at nine (Branson, 1993) and the differences in average size of Australian and US listed companies.

Boards of directors are far from homogeneous both in terms of size and composition. The median firm's board of directors has a ratio of outside (non-executive) to total directors of 50% (67%). The proportion of outside directors is slightly lower than that for United States firms, but higher than that of United Kingdom firms.[19]

4. Results

Section 4.1 provides a comparison of insider and outsider controlled boards and an examination of correlations between independent variables. The primary findings are contained in Section 4.2, which provides the multivariate results for cross-sectional models. Alternate models (lagged and changes models) are tested in Section 4.3.

4.1. Comparison of firms with insider and outsider controlled boards

Following Weisbach (1988), companies are classified as "insider controlled" if the proportion of outside directors is no more than 0.4 and "outside controlled" if the proportion of outside directors is at least 0.6.[20] Other boards are termed "mixed". Fifty-six boards (41.5%) are outside controlled, 62 boards (45.9%) are inside controlled and only 17 boards (12.6%) are "mixed".[21]

Table 2 reports the results of the comparison of inside and outside controlled boards. TENURE, FCF and inside shareholdings are significantly greater (at the

[18] Hermalin and Weisbach (1988) report a median board size of 13 directors for NYSE companies in 1977, and only 10% of firms in their sample had boards with 10 or fewer members.

[19] The most direct comparison for United States companies is Booth and Deli (1996) who also report board composition as at 1989 and use a similar definition of outside directors. They report a mean of 59% outsiders. Monks and Minow (1995) report that the proportion of outside directors for United Kingdom firms is 42%.

[20] An alternative classification scheme that classified outside boards as those with more than 50% outsiders and inside boards as those with less than 50% outsiders was also used. Unless otherwise noted, the same qualitative conclusions emerge from this comparison.

[21] The sample has relatively fewer "mixed" boards than the Weisbach (1988) sample, which was based on NYSE firms as at 1980. Weisbach reported 34.9% outside controlled, 25.3% inside controlled and 39.8% mixed.

Table 2
Comparison of 62 insider controlled and 56 outsider controlled companies

	Insider controlled mean (median)	Outsider controlled mean (median)	Difference	*t* Stat.	*p* Value (two-tailed)	Mann–Whitney *U*	*p* Value (two-tailed)
A: CEO tenure							
TENURE	5.48 (2.5)	3.09 (2)	2.39, 0.5	2.19	0.030	1455.5	0.096
B: Cash flow							
CFO/total assets	−0.06 (0.02)	0.22 (0.03)	−0.28, −0.01	−1.41	0.162	1656.0	0.564
FCF	0.317 (0)	0.143 (0)	0.174, 0	2.27	0.024	1445.0	0.024
C: Financial structure							
DEBT	51.1 (52.4)	46.4 (51.4)	4.7, 1.0	0.86	0.392	1585.0	0.340
Long-term debt/total assets (%)	19.2 (16.7)	17.5 (4.6)	1.7, 12.1	0.41	0.678	1369.0	0.034
D: Firm size							
Total assets ($000's)	95,455 (33,411)	172,217 (42,022)	−76,763, −8611	−1.44	0.150	1607.0	0.402
Operating revenue ($000's)	95,993 (19,412)	143,034 (22,899)	−47,042, −3487	−0.80	0.422	1735.5	0.878
E: Diversification							
INDUSTRY	2 (1)	1.981 (1)	0.019, 0	0.07	0.940	1757.0	0.966
GEOGRAPHIC	1.66 (1)	1.46 (1)	0.20, 0	1.17	0.242	1551.5	0.194

F: Growth options							
MBA	1.112 (0.979)	1.258 (1.036)	−0.146, −0.057	−0.77	0.442	1614.0	0.424
PE	7.93 (12.14)	9.54 (14.395)	−1.61, −2.255	−0.71	0.474	617.5	0.350
R&D/assets	0.003 (0)	0.008 (0)	0.005, 0	−0.79	0.434	1700	0.554
G: Inside ownership							
DIR_SHARE	32.91 (29.3)	22.162 (2.9)	10.745, 26.4	2.03	0.044	1398.0	0.050
INHOLD	26.959 (19.604)	8.152 (0.150)	18.807, 19.454	4.516	0.000	904	0.000
CEO shareholding (%)	15.17 (4.63)	4.98 (0.01)	10.19, 4.62	3.088	0.002	1115	0.000
CEO shareholding/DIR_SHARE (%)	44.02 (35.43)	20.01 (0.75)	24.01 (34.68)	3.047	0.002	524	0.002
Median outside directors' shareholding	2.90 (0.00)	1.22 (0.02)	1.68, −0.02	1.384	0.168	1403.5	0.090
Total outside directors' shareholding (%)	4.18 (0.01)	9.70 (0.58)	−5.52, −0.57	−1.868	0.064	990	0.000
H: Ownership dispersion							
Shareholding of largest shareholder (%)	36.1 (30.7)	33.3 (26.0)	2.8, 4.7	0.74	0.456	1593.0	0.362
Top 20 shareholders (%)	81.1 (84.5)	76.7 (81.1)	4.4, 3.4	1.50	0.136	1560.5	0.278

Outsider controlled firms are those where the proportion of outside directors is at least 0.6. Insider controlled companies are those where the proportion of outside directors is no more than 0.4.

5% level) for firms with insider controlled boards than for firms with outside controlled boards.

A closer examination of the relationship between inside ownership and board type shows that CEO shareholding is significantly higher for companies with inside boards, supporting the proposition that CEO bargaining power is an important determinant of board composition. The nonparametric Mann–Whitney test also shows that companies with inside controlled boards have greater long-term debt, consistent with the argument of Bathala and Rao (1995) and suggesting that there may be substitution in the use of debt and outside directors as mechanisms to reduce managerial discretion.[22] The relationship between leverage and board type could also be due to other firm characteristics that are related to leverage such as industry membership or the level of past cash flows.

To aid in the interpretations of the comparisons in Table 2, correlations were calculated between board composition and the independent variables. Table 3 reports these correlations. Highly significant negative correlations are found between FCF and the number of outside directors and MBA. The latter of course is expected given that FCF can only be 1 where the firm's market to book ratio is less than the median. Significant positive correlations also exist between (i) DEBT and MBA and (ii) TENURE and DIR_SHARE. These correlations lead to a concern in relation to potential multicollinearity in subsequent multiple regression analysis. The analysis of the multiple regression results thus includes consideration of collinearity diagnostics.

The proportion of outside directors is also positively correlated with the size of the board and SIZE. SIZE is included as a control variable in the subsequent multivariate analysis. In other studies, leverage was found to be positively associated with the proportion of outside directors (Bathala and Rao, 1995; Pearce and Zahra, 1992) leading to its inclusion as a control variable.

4.2. Multivariate analysis: cross-sectional model

The results of OLS models that treat directors' shareholdings as a simple continuous variable (i.e., ignoring potential entrenchment effects) are reported in Table 4. Table 5 reports the results using a logit model where the dependent variable is the presence of an outside controlled board. For each of these tables, Models 1 and 2 differ in the selection of proxy for the investment opportunity set. Models 3 and 4 provide a test of Hypothesis 4. The expected interaction of inside ownership and the investment opportunity set is examined by introducing interaction terms, being the product of DIR_SHARE and proxies for the investment opportunity set (being MBA in Model 3 and PE in Model 4). If the coefficient of

[22] Similar conclusions apply if outside boards are defined as those with more than 50% outsiders, but outside boards have significantly higher Cash Flow From Operations/Total Assets.

Table 3
Correlation matrix
Pearson correlation coefficients are reported below. Two-tailed significance levels are in parentheses.

Variable	Number of outsiders	Number of directors	Proportion outsiders	SIZE	MBA	CEO_ SHARE	DIR_ SHARE	INHOLD	DEBT	TENURE	GEOGRAPHIC	INDUSTRY	FCF	MAJORITY
Number of outsiders	–	0.617 (0.000)	0.772 (0.000)	0.305 (0.000)	0.223 (0.009)	−0.305 (0.001)	−0.236 (0.006)	−0.343 (0.000)	−0.059 (0.496)	−0.103 (0.232)	−0.029 (0.738)	−0.026 (0.762)	−0.232 (0.045)	−0.208 (.015)
Number of directors	–	1	0.216 (0.012)	0.560 (0.000)	0.165 (0.056)	−0.240 (0.010)	−0.179 (0.038)	−0.129 (0.135)	−0.062 (0.472)	0.125 (0.147)	−0.062 (0.472)	0.108 (0.210)	−0.173 (0.045)	−0.267 (0.002)
Proportion outsiders	–	–	1	0.071 (0.412)	0.089 (0.300)	−0.275 (0.003)	−0.237 (0.006)	−0.439 (0.000)	−0.072 (0.404)	−0.237 (0.001)	−0.077 (0.372)	−0.011 (0.892)	−0.137 (0.113)	−0.098 (0.259)
SIZE	–	–	–	1, –	−0.033 (0.708)	−0.053 (0.579)	−0.153 (0.076)	−0.093 (0.282)	−0.066 (0.445)	0.128 (0.140)	0.213 (0.013)	0.382 (0.003)	−0.066 (0.448)	−0.023 (0.792)
MBA	–	–	–	–	1	−0.146 (0.121)	−0.075 (0.389)	−0.134 (0.122)	0.172 (0.046)	0.091 (0.294)	0.088 (0.310)	0.007 (0.933)	−0.245 (0.004)	−0.056 (0.521)
CEO_ SHARE	–	–	–			1	0.543 (0.000)	0.545 (0.000)	0.038 (0.688)	0.158 (0.092)	−0.069 (0.466)	0.038 (0.690)	0.138 (0.142)	0.252 (0.007)
DIR_ SHARE	–	–	–	–	–		1	0.741 (0.000)	0.141 (0.102)	0.178 (0.039)	−0.1242 (0.151)	−0.001 (0.995)	0.133 (0.124)	0.007 (0.529)
INHOLD	–	–	–				–	–	0.094 (0.277)	0.230 (0.007)	−0.078 (.)	0.031 (0.725)	0.029 (0.738)	0.027 (0.752)
DEBT	–	–	–	–	–		–		1	−0.119 (0.168)	0.233 (0.006)	0.0157 (0.857)	−0.166 (0.055)	−0.055 (0.529)
TENURE	–	–	–	–	–		–		–	1	−0.057 (0.505)	0.021 (0.807)	−0.096 (0.273)	−0.104 (0.229)
GEOGRAPHIC	–	–	–	–	–		–		–	–	1	0.389 (0.000)	−0.072 (0.406)	−0.072 (0.406)
INDUSTRY	–	–	–	–	–		–		–	–	–	1	−0.015 (0.866)	−0.001 (0.990)
FCF	–	–	–	–	–		–		–	–	–	–	1	0.162 (0.060)
MAJORITY	–	–	–	–	–		–		–	–		–		1

Table 4
Multiple regression results—proportion of outside directors

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.462 (0.003)	0.545 (0.014)	0.473 (0.003)	0.641 (0.006)	0.698 (0.001)
TENURE	−0.016 (0.000)	−0.014 (0.003)	−0.015 (0.000)	−0.013 (0.003)	−0.013 (0.003)
FCF	−0.083 (0.080)	−0.073 (0.132)	−0.075 (0.103)	−0.061 (0.178)	−0.056 (0.185)
MAJORITY	−0.079 (0.079)	−0.054 (0.213)	−0.082 (0.073)	−0.069 (0.157)	−0.074 (0.101)
INDUSTRY	0.002 (0.450)	−0.011 (0.310)	0.002 (0.453)	−0.006 (0.404)	
GEOGRAPHIC	−0.045 (0.061)	−0.021 (0.283)	−0.045 (0.061)	−0.026 (0.241)	−0.030 (0.173)
MBA	0.034 (0.114)		0.025 (0.198)		
DIR_SHARE ×MBA			0.182 (0.226)		
PE		0.003 (0.096)		−0.002 (0.323)	−0.002 (0.321)
DIR_SHARE ×PE				0.023 (0.066)	0.023 (0.059)
DIR_SHARE	−0.002 (0.049)	−0.002 (0.015)	−0.003 (0.064)	−0.004 (0.004)	−0.004 (0.001)
DEBT	−0.010 (0.147)	−0.001 (0.468)	−0.012 (0.125)	−0.006 (0.343)	
SIZE	0.017 (0.131)	0.010 (0.319)	0.017 (0.129)	0.006 (0.323)	
F ratio	3.103 (0.021)	2.375 (0.019)	2.840 (0.003)	2.401 (0.015)	3.500 (0.002)
Adjusted R^2	0.124	0.116	0.121	0.130	0.157

The dependent variable is the proportion of outside directors. The sample consists of 135 observations for 135 firms for year-end 1989. Variable coefficient estimates are shown with one-tailed probabilities in parentheses.

the interaction dummy is statistically significant, this indicates that the simultaneous effects of the level of inside ownership and the level of growth options will reinforce the individual effects of these variables.

In Model 5, variables which are not weakly significant ($p < 0.1$) in at least one of Models 1–4 are removed to create a reduced form regression. The regressions are discussed as a group, focusing initially on each type of variable independently.

There is a strongly significant association between TENURE and the proportion of outside directors (Table 4) and board type (Table 5) in each of the models. These tests thus provide strong support for the proposition that board composition varies with the bargaining power of the CEO. The tenure of the CEO is also associated with board leadership (Table 6). Higher levels of TENURE are associated with duality in all models providing support for Hypothesis 2. Together, these results indicate that CEOs with greater bargaining power are subject to lower levels of monitoring by outside directors and potentially increase their power base through leadership of the board. Concern that the association between board leadership and TENURE arises simply due to the voting power of outside directors in the election of the Chairperson is addressed by controlling for the number of outside directors (Model 4 in Table 6). Whilst firms with fewer outsiders are more likely to have unitary leadership of the board, the association between board leadership and TENURE is still evident after controlling for the composition of the board.

Table 5
Logit models of determinants of outside controlled boards

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−0.686 (0.312)	−0.632 (0.187)	−0.443 (0.375)	0.585 (0.390)	1.659 (0.011)
TENURE	−0.111 (0.069)	−0.087 (0.016)	−0.115 (0.005)	−0.090 (0.034)	−0.866 (0.037)
FCF	−0.784 (0.059)	−0.599 (0.069)	−0.685 (0.090)	−0.396 (0.246)	−0.451 (0.209)
MAJORITY	−0.851 (0.038)	−1.008 (0.023)	−0.921 (0.030)	−1.355 (0.019)	−1.336 (0.018)
INDUSTRY	1.049 (0.268)	0.033 (0.215)	0.115 (0.251)	0.132 (0.256)	
GEOGRAPHIC	−0.502 (0.023)	−0.487 (0.013)	−0.508 (0.023)	−0.377 (0.120)	−0.255 (0.169)
MBA	0.265 (0.153)		0.139 (0.291)		
DIR_SHARE ×MBA			0.014 (0.100)		
PE		0.024 (0.144)		−0.047 (0.108)	−0.044 (0.124)
DIR_SHARE ×PE				0.002 (0.036)	0.002 (0.036)
DIR_SHARE	−0.009 (0.130)	−0.010 (0.055)	−0.262 (0.044)	−0.041 (0.005)	−0.039 (0.003)
DEBT	−0.046 (0.295)	0.002 (0.245)	−0.065 (0.235)	−0.058 (0.332)	
SIZE	0.159 (0.108)	0.144 (0.102)	0.156 (0.114)	0.049 (0.302)	
χ^2	21.973 (0.009)	15.618 (0.075)	23.632 (0.008)	21.076 (0.021)	19.855 (0.006)
Percent correct					
Outside controlled	50.00	48.72	51.79	58.97	53.85
Other	75.95	78.57	75.95	78.57	80.36
Overall	65.19	66.32	65.93	70.53	69.47
Nagelkerke R^2	0.202	0.204	0.216	0.268	0.254

The dependent variable is the presence of an outside controlled board (at least 60% outsiders). The sample consists of 135 firms for year-end 1989. Variable coefficient estimates are shown with significance levels in parentheses.

The regression models described in Tables 4 and 5 do not directly test Hypothesis 3, which relates to the level of managerial ownership. However, consistent with prior research (e.g., Bathala and Rao, 1995) the analysis which treats directors' shareholdings as a continuous variable indicates a negative relationship between DIR_SHARE and the proportion of outside directors. A piece-wise regression, the results of which are shown in Table 7, tests the hypothesized non-linear relationship between directors' shareholdings and representation by outside directors.

The negative association between representation by outside directors and DIR_SHARE is consistent with either the alignment of shareholder and management interests as managerial ownership increases (and a reduced demand for managerial monitoring) or by managerial control of voting rights leading to control of the board of directors. The former explanation implies that outside director representation will decline as managerial ownership increases. The latter explanation implies that only where managerial ownership reaches a critical level (resulting in managerial control) representation by outside directors will decline.

Table 6
Board leadership logistic regression results

	Model 1	Model 2	Model 3	Model 4
Intercept	1.924 (0.109)	3.736 (0.014)	2.239 (0.099)	10.885 (0.004)
CEO Tenure	0.108 (0.002)	0.081 (0.020)	0.109 (0.002)	0.272 (0.000)
Free cash flow	0.031 (0.473)		0.050 (0.460)	
Majority shareholder	0.209 (0.389)		0.174 (0.366)	0.646 (0.257)
Debt to equity	0.161 (0.059)	0.184 (0.038)	0.163 (0.056)	0.206 (0.198)
No. Industry Segments	0.190 (0.142)	0.257 (0.074)	0.192 (0.140)	0.969 (0.006)
No. Geographic Segments	0.269 (0.150)		0.261 (0.159)	0.360 (0.214)
Market to book assets	−1.214 (0.012)	−1.197 (0.014)	−1.437 (0.020)	−2.292 (0.019)
Market to book equity				
Dir share 0–5%				0.017 (0.479)
Dir share 5–25%				0.028 (0.355)
Dir share 25%+				−0.092 (0.043)
Directors' Shareholding	0.009 (0.134)		0.001 (0.480)	
Dir share × MB assets			0.008 (0.297)	
Ln assets	−0.334 (0.014)	−0.339 (0.015)	−0.341 (0.013)	−1.283 (0.001)
Proportion outsiders		−2.717 (0.000)		
Model χ^2	23.134 (0.006)	32.792 (0.000)	23.406 (0.009)	29.255 (0.002)
Percent correct				
Dual	92.78	91.75	94.85	94.23
Unitary	28.95	34.21	28.95	58.82
Overall	78.81	75.56	76.30	85.51

The dependent variable is unitary leadership (the presence of a CEO Chairperson). The sample consists of 133 observations for 135 firms for year-end 1989. Variable estimates are shown with significance levels in parentheses.

The explanations are not mutually exclusive, and if both explanations are valid, a non-linear relationship may exist as illustrated in Fig. 1.

Prior studies that examine the relationship between managerial ownership interest and firm value do not identify the level of ownership interests at which managerial ownership leads to entrenchment effects. Morck et al. (1988) find that Tobin's *Q* increases until inside ownership reaches 5%, then declines until ownership reaches 25%, then increases as insider ownership increases above 25%.[23] McConnell and Servaes (1990), sampling from a different population and a different time period and using a curvilinear regression find different coefficients for ownership interests between 5% and 25% and between 25% and 100%.[24]

Although there is no systematic evidence on the relationship between inside ownership and the costs of management shareholder contracting, initially the same

[23] Inside ownership in these studies is defined in terms of stockholdings of directors (Morck et al.) or directors and officers (McConnell and Servaes). Neither study distinguishes between inside directors and outside directors.

[24] Kole (1995) argues that these conflicting results may be due to the differences in size of the sample firms.

Table 7
OLS Piece-wise linear regression—proportion of outside directors

	Model 1	Model 2	Model 3	Model 4
Intercept	0.517 (0.002)	0.476 (0.005)	0.579 (0.000)	0.619 (0.000)
TENURE	−0.015 (0.000)	−0.016 (0.000)	−0.012 (0.002)	−0.015 (0.003)
FCF	−0.079 (0.089)	−0.079 (0.087)	−0.044 (0.215)	−0.043 (0.221)
MAJORITY	−0.100 (0.045)	−0.102 (0.041)	−0.063 (0.106)	−0.074 (0.083)
INDUSTRY	0.006 (0.392)	0.008 (0.351)	0.007 (0.350)	0.005 (0.399)
GEOGRAPHIC	−0.050 (0.048)	−0.057 (0.028)	−0.046 (0.044)	−0.044 (0.054)
MBA	0.030 (0.142)	0.032 (0.126)	0.020 (0.228)	0.019 (0.232)
DIR_SHARE 0–5% (0–2%) Model 1 (Model 2)[a]	−0.005 (0.387)	0.040 (0.160)		
DIR_SHARE 5–25% (2–35%) Model 1 (Model 2)[a]	−0.004 (0.135)	−0.006 (0.011)		
DIR_SHARE 25%+ (35%+) Model 1 (Model 2)[b]	0.151 (0.355)	0.002 (0.190)		
INHOLD 0–5% (0–10%) Model 3 (Model 4)[c]			−0.051 (0.015)	−0.037 (0.003)
INHOLD 5–25% (10–20%)[c] Model 3 (Model 4)			0.008 (0.133)	0.024 (0.036)
INHOLD 25%+ (20%+)[c] Model 3 (Model 4)			−0.005 (0.014)	−0.005 (0.008)
DEBT	−0.010 (0.157)	−0.011 (0.141)	−0.006 (0.275)	−0.005 (0.311)
SIZE	0.014 (0.180)	0.016 (0.153)	0.009 (0.225)	0.008 (0.308)
F ratio	2.646 (0.004)	2.878 (0.002)	4.664 (0.000)	4.926 (0.000)
Adjusted R^2	0.119	0.134	0.231	0.244

The sample consists of 135 firms and uses financial data for the year ended 1989. The dependent variable is the proportion of outside directors. Variable coefficient estimates are shown with one-tailed probabilities in parentheses.

[a] DIR_SHARE ($X-Y$%) measures the directors' shareholdings in excess of X%. The maximum value for this variable is Y%$-X$%. [DIR_SHARE($X-Y$%) = min(DIR_SHARE$-X$, $Y-X$)].

[b] DIR_SHARE Z%+ is the directors' shareholdings in excess of Z%. The maximum value for this variable is 100%$-Z$%. [DIR_SHARE Z%+ = min(DIR_SHARE$-Z$%, 0)].

[c] INHOLD records the percentage shareholding of inside (i.e., executive and "gray") directors.

bands of managerial ownership as used in Morck et al. (1988) and McConnell and Servaes (1990) are used to examine the relationship between managerial ownership and board composition.[25] Model 1 in Table 7 reports the related piece-wise

[25] Fifty-nine companies (43.7%) had DIR_SHARE in the range 0–5%, 22 companies (16.3%) had DIR_SHARE in the range 5–25% and 54 companies (40%) had DIR_SHARE in the range 25–100%.

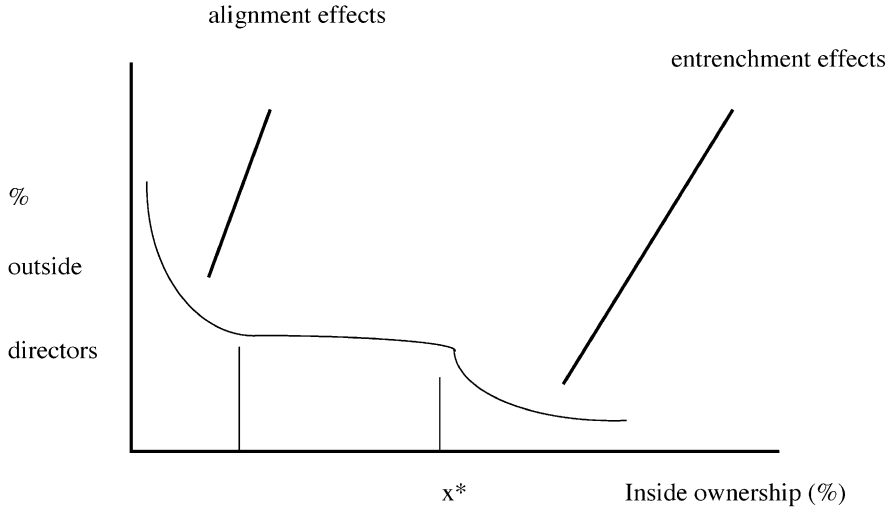

Fig. 1. Illustrative effects of managerial alignment and entrenchment on board composition.

regression results. Alternate turning points were investigated based on the distribution of DIR_SHARE and INHOLD. The alternative cut-off points of 2% and 35% for DIR_SHARE and 10% and 20% for INHOLD (Models 2 and 4, respectively) were obtained by partitioning the sample into three groups of approximately equal size.[26]

There is evidence of a non-linear association between managerial shareholding, defined in terms of inside (but not total) directors' shareholding and board composition. As the level of INHOLD increases up to 10%, representation by outside directors declines indicating lower levels of managerial monitoring. In addition, consistent with Hypothesis 3(b) the regression models show a negative association between representation by outside directors and INHOLD for "high" ($>25\%$ Model 3 and $>20\%$ Model 4) levels of managerial shareholding consistent with managerial entrenchment and control of voting rights.

The change of the sign of the relationship between INHOLD and board composition in Models 3 and 4 is of special interest and supports the hypothesized non-linear relationship and the dual effects of inside ownership on incentive alignment and entrenchment. Tests for the equality of regression coefficients reveals significant (at 0.05) differences between the INHOLD coefficients in Model 4 (both INHOLD 0–10% vs. INHOLD 10–20% and INHOLD 10–20% vs. INHOLD 20 +). Hence, it appears that managerial entrenchment occurs for

[26] Approximately 37% of firms have DIR_SHARE in the range 0–2%, 28% of firms in the range 2–35% and 35% of firms have DIR_SHARE above 35%.

Australian companies at a threshold level well below that required to nominally control voting rights (i.e., a simple majority).

These results are also relevant to the analysis of the results of prior studies that examine the relationship between inside ownership and firm value. The evidence that as managerial shareholding rises, firms become less valuable, may be explained in part by evidence documented here that changes in corporate governance accompany changes in managerial ownership beyond a threshold level.

Whilst there is no evidence of an association between board composition (or type) and growth opportunities, there is evidence of an interaction between growth opportunities, directors' shareholdings and representation by outside directors. Higher levels of growth opportunities and inside ownership are associated with higher levels of representation by outside directors in both OLS and logit models (Models 4 and 5, Tables 4 and 5).[27] The interaction indicates that companies with more abundant investment opportunities and high levels of inside shareholdings face higher potential agency costs that are mitigated by outside director monitoring. The fact that the growth option variables themselves are not associated with board composition is of interest as it suggests that the agency problems of growth options arise in the situation where inside shareholdings are greater.

The control variable DEBT is not associated with either the proportion or number of outside directors in any model, which suggests that the prior conclusions relating to an association between board composition and leverage are due to a failure to control for the firm's investment opportunity set or other variables correlated with leverage. The other control variable, SIZE, is not associated with the proportion of outside directors. This contrasts to prior research (Beatty and Zajac, 1994; Brickley and James, 1987) which reports a positive association between firm size and board composition without controlling for other variables associated with firm size such as the firm's ownership structure or level of diversification.

4.3. Multivariate analysis—lagged and changes models

A lagged model, discussed in Section 3.1, is a variant of the OLS regression models reported in Table 6, where the independent variables are measured as at 1987. The original sample of 135 companies is reduced to 100 due mainly to the fact that many firms in the 1987 sample were not listed as at 1986.[28]

Table 8 provides the regression results for the lagged models. In general, there is little evidence of a lagged relationship between the explanatory variables and

[27] The level of significance of the interaction variable is greater if inside shareholdings is restricted to the shareholding of inside and gray directors.

[28] Twenty companies (14.8%) were not listed in 1987, nine companies (6.7%) were not listed in 1986, Annual Reports were not available for three firms (2.2%) and three firms were lost for other reasons. The 1986 information was required in order to estimate cash flows for the 1987 financial year.

Table 8
Board composition—OLS regression using lagged independent variables

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.261 (0.123)	0.538 (0.027)	0.241 (0.160)	0.577 (0.020)	0.576 (0.000)
TENURE	−0.035 (0.196)	−0.049 (0.122)	−0.035 (0.197)	−0.048 (0.127)	
FCF	0.027 (0.351)	−0.034 (0.348)	0.030 (0.342)	−0.049 (0.287)	
MAJORITY	−0.087 (0.153)	−0.082 (0.211)	−0.089 (0.149)	−0.086 (0.197)	
INDUSTRY	0.012 (0.318)	0.006 (0.420)	0.012 (0.318)	0.011 (0.349)	
GEOGRAPHIC	−0.038 (0.177)	−0.061 (0.420)	−0.037 (0.182)	−0.059 (0.103)	
MBA	0.055 (0.385)		0.007 (0.408)		
DIR_SHARE ×MBA			−0.017 (0.412)		
PE		−0.004 (0.130)		−0.008 (0.048)	−0.003 (0.152)
DIR_SHARE ×PE				0.012 (0.108)	
DIR_SHARE	−0.010 (0.050)	−0.010 (0.041)	0.023 (0.438)	−0.165 (0.094)	−0.011 (0.027)
DEBT	−0.062 (0.356)	0.018 (0.222)	−0.060 (0.354)	0.020 (0.198)	
SIZE	0.025 (0.125)	0.013 (0.324)	1.169 (0.122)	0.013 (0.315)	
F ratio	0.977 (0.464)	1.007 (0.443)	0.875 (0.559)	1.069 (0.398)	2.396 (0.094)
Adjusted R^2	−0.002	0.000	−0.012	0.009	0.036

The dependent variable is board composition as at 1989. Independent variables are measured as at 1987 balance date. The sample consists of 100 firms. Variable coefficient estimates are shown with one-tailed probabilities in parentheses.

board composition. The lagged models explain less of the variation in board composition relative to the cross-sectional models (Table 5). Moreover, the *F* ratios are significant in each of the cross-sectional models, but in none of the lagged models.

There is evidence of a lagged negative relationship between DIR_SHARE and representation by outside directors.[29] TENURE, which was strongly associated with board composition in the cross-sectional model, is not associated with board composition in lagged models. This finding further supports the proposition TENURE proxies for the bargaining position of the CEO relative to the rest of the board and thus will be associated with contemporaneous measures of board composition.

The analysis of changes in board composition is reported in Table 9. These models have similar explanatory power to corresponding cross-sectional models shown in Table 5. The only influence associated with changes in the proportion of

[29] The relationship between the *number* of outside directors in 1989 and lagged values for the independent variables was also examined. SIZE, MAJORITY and PE, which were associated with the number of outside directors in the cross-sectional model, are also associated with the number of outside directors in the lagged model. In addition, GEOGRAPHIC diversification is negatively associated with the number of outside directors in the lagged model indicating that insiders tend to be added after a firm enters new product markets.

Table 9
Multivariate OLS analysis of changes in the proportion and number of outside directors 1989–1993

	Model 1	Model 2
Intercept	0.009 (0.397)	0.007 (0.414)
TENURE	−0.004 (0.127)	−0.005 (0.078)
FCF	−0.030 (0.320)	−0.018 (0.390)
MAJORITY	−0.263 (0.000)	−0.266 (0.000)
INDUSTRY	0.016 (0.324)	0.010 (0.385)
GEOGRAPHIC	0.035 (0.196)	0.039 (0.177)
MBA	−0.067 (0.441)	
PE		0.052 (0.476)
DIR_SHARE	−0.139 (0.158)	−0.117 (0.198)
DEBT	−0.001 (0.334)	−0.002 (0.314)
SIZE	−0.015 (0.205)	−0.006 (0.305)
F ratio	2.224 (0.031)	2.177 (0.034)
Adjusted R^2	0.129	0.124

The dependent variable in is the change in the proportion of outside directors over the period 1989–1993. The independent variables are measured as changes in the relevant variable over the period from the 1989 to 1993 financial statements. The sample consists of 77 companies. Variable coefficient estimates are shown with one-tailed probabilities in parentheses.

outside directors is the establishment of a majority shareholding. This negative association is consistent with the results from the cross-sectional models. There is no evidence of an association between changes in TENURE and changes in the proportion of outside directors. Additional tests, not reported in the table, examine the relationship between changes in the proportion of non-executive (cf. outside) directors and the independent variables in Models 1 and 2 in Table 9. Change in TENURE is negatively associated (Model 1, $p = 0.021$; $p = 0.012$ Model 2) with changes in board composition.[30] Over time, increased tenure and bargaining ability of the CEO are associated with reduction in the proportion of "gray" and "outside" director categories.

4.4. Sensitivity tests

It is possible that the relationship between board composition and CEO tenure is bi-directional. That is, CEO tenure may affect board composition and board composition itself may affect CEO tenure (i.e., a CEO may be more likely to be removed if there is a "strong" board). This could lead to correlation of the error term with CEO tenure and violate on of the assumptions of regression analysis.

[30] The increased level of regulatory activity in the period 1989–1993 does not appear to explain this result as there is only a minor increase in representation by outside directors for surviving firms.

To test whether the relationship is endogenous, a two-staged least squares (2SLS) model is developed and tested. In the first stage, CEO tenure is estimated using the following model:

$$\text{TEN} = \alpha + \beta.\text{CEO\_DIR} + \delta.\text{CEO\_CHAIR} + \gamma.\text{OPBT/TA} + \varphi.\text{DIR\_SHARE} + \omega.\text{MAJOR} + \upsilon.\text{MVEQUITY}$$

where:

CEO_DIR	is the number of other directorships held by the CEO
CEO_CHAIR	is a dummy variable that takes on the value of 1 where the CEO is the chairperson
OPBT/TA	is the ratio of operating profit before tax to total assets
DIR_SHARE	is total shareholding of the board as a percentage of total ordinary shares
MAJOR	is a dummy variable that takes on the value of one if there is a majority shareholder and
MVEQUITY	is the market value of equity

The number of other directorships held by the CEO is included as a proxy for the degree of specificity of the CEO's human capital. Appointment to the board of other companies indicates that the CEO of the sample firm has skills that are of value to other companies and hence lower losses if removed by the other directors.

CEO_CHAIR is included as an independent variable as it may be more difficult to remove a CEO who is also chairman. The chairperson has certain additional formal powers at both a meeting of the board and also a meeting of the members. In addition, the chairman has the ability to control the board agenda. Firm performance, as measured by OPBT/TA is included as a dependent variable as CEOs are more likely to retain their positions if returns are higher (Weisbach, 1988). DIR_SHARE is expected to be positively associated with tenure as increased levels of directors' shareholding increases the power of the board relative to "outside" shareholders and reduces the accountability of the board for past decisions, including decisions relating to the retention or replacement of the CEO.

MAJOR is expected to be negatively associated with tenure as majority shareholders have the capacity to force turnover. Firm size, as measured by MVEQUITY, is expected to be negatively associated with CEO turnover as larger firms tend to be subject to greater levels of scrutiny by the financial press and pressure from institutional investors. This attention may place directors of large firms under greater pressure to replace a poorly performing CEO.

In the second stage, the original regression models are estimated with the predicted values of CEO tenure from the above model substituted for the actual values. Overall, the results from using a two-staged least squared model are qualitatively similar to those obtained in the OLS model. In particular, the

coefficients for (the predicted values) CEO tenure is still negative and significant ($p \leqq 0.03$, one-tailed) in all models based on those reported in Table 4.

A further concern may be that CEO tenure may be a proxy for constructs other than the bargaining power of the CEO. In particular, CEO tenure may be a proxy for CEO shareholding or past performance of the firm. However, as reported in Table 3, the correlation between CEO shareholding and CEO tenure is relatively low (0.091) and not significant. From Table 3, CEO tenure is significantly correlated with the proportion of outside directors, inside shareholdings and directors' shareholdings. The correlation between CEO tenure and CEO shareholding is relatively low (0.158) and not significant. Additional analysis revealed low correlations between CEO tenure and measures of past performance such as return on assets (0.156) and return on equity (0.095) and cash flow from operations to total assets (-0.017). None of these correlations are significant at the 5% level.

To address the issue that CEO tenure may not be a reliable proxy for CEO power, alternative proxies for the bargaining power of the CEO are substituted into the models described in Table 4. Alternative proxies used are the a dummy for whether the CEO is also the chairperson, the number of outside (other) directorships of the CEO, shareholding of the CEO relative to that of the rest of the board and return on assets.

There is a negative and significant relationship between the dummy variable for the CEO also being the chairman of the board, and the proportion of outside directors in each of the models in Table 4. The bargaining power can also be considered a function of share ownership of the CEO relative to that of the rest of the board. A dummy variable is used which takes on the value of 1 where the shareholding of the CEO is greater than that of the aggregate of the other directors. This variable is also negatively associated ($p < 0.05$) with the proportion of outside directors in all models from Table 4 where this variable is substituted for CEO tenure. However, a third alternate measure of CEO bargaining power, the number of outside directorships held by the CEO, is not associated with the proportion of outside directors. Taken together, these results indicate that the CEO tenure appears to be a reasonable proxy for the bargaining position of the CEO relative to that of the rest of the board and that qualitatively similar conclusions would follow if alternative proxies for this construct were substituted.

5. Summary and conclusions

The principal aims of this study is to empirically examine the impact of CEO bargaining power and inside ownership on corporate board composition and leadership. The results provide evidence that strongly supports the model of Hermalin and Weisbach (1998) where board composition is the outcome of a bargaining process between the CEO and the rest of the board. Whilst this model does not explicitly identify the set of factors that will determine the outcome of

this bargaining process, the competing interests of the CEO and outside shareholders are both expected to affect the outcome in terms of board composition. Representation by outside directors is expected to vary with the demand by outside shareholders for managerial monitoring, the comparative advantage of monitoring by outside directors relative to other mechanisms and the bargaining power of the CEO relative to the rest of the board. Hence, traditional "agency" variables that attempt to proxy for the demand for monitoring by outside directors are also included in the analysis as control variables. In doing so, the analysis explicitly recognizes that the traditional "demand" driven models and the "endogenous" model may both partly explain variation in board composition and leadership.

The study is based on a random sample of corporations listed on the Australian Stock Exchange. Unlike earlier studies based on samples of United States firms, the setting chosen is one that is relatively free of regulatory restrictions on the selection of directors and "noise" created by state level variation in corporations law and non-uniformity of stock exchange regulations, which directly and indirectly effect the selection and appointment of directors.

The empirical results contribute to the literature by showing a significant role for CEO tenure and inside ownership in the determination of board composition. The evidence that representation by outside directors decreases with the tenure of the CEO provides support for the analytical model developed by Hermalin and Weisbach (1998). Where CEOs have relatively low tenure, they have weaker bargaining ability relative to the rest of the board and are subject to greater monitoring by outside directors. This result contrasts with that of Whidbee (1997) whose analysis was restricted to the US banking industry and provides further evidence of that legal factors limit the generalizability of evidence from the non-financial sector.

Consistent with prior studies, there is evidence that companies with majority shareholders are less likely to have boards dominated by outside directors. There is also evidence that companies with boards dominated by insiders are more geographically diversified supporting the argument that CEOs heading firms with boards more "friendly" to management are more likely to pursue diversification strategies to reduce the level of diversifiable managerial risk.

A particularly interesting finding is that the relationship between inside ownership and board composition appears to exist only for certain levels of inside ownership. At low levels of inside ownership there appears to be a negative relationship consistent with alignment of interests between insiders and outside shareholders and a reduced demand for monitoring by outside directors. This negative relationship between inside ownership and representation by outside directors also exists for high levels of inside ownership, suggesting that managerial control of voting rights allows insiders greater control over the process of director selection and appointment.

It is of some interest to compare the results of this research with evidence relating to CEO compensation. Hill and Phan (1991) report that as tenure

increases, the relationship between pay and firm size and pay and firm risk become stronger and the relationship between pay and share market returns become weaker. They interpret this to indicate that as CEO tenure increases, his/her influence on the board of directors leads to a compensation package that is preferable to the CEO. Together, the results suggest that CEOs with longer tenure face less monitoring by outside directors and a compensation package that favor their risk aversion.

These results also provide evidence relevant to the evaluation of the relationship between managerial shareholdings and firm value. The failure of previous studies to find a clear relationship between directors' shareholdings and the market to book value may be due to organizational variation in corporate governance structures. Whilst different levels of managerial ownership may suggest different levels of agency cost, if corporate governance mechanisms also vary with ownership structure these "problems" will be mitigated and hence it is less likely that any relation between inside ownership and firm value will be observed.

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Appendix A. Exhibit 1

Variable definitions

Variable	Description	Definition
CEO_SHARE	CEO shareholding	Percentage of shares held by the CEO
DEBT	Debt to equity	Total liabilities divided by shareholders' equity
DIR_SHARE	Board shareholding	The sum of shares owned by a director, held in trust for a director, shares over which directors hold an option and shares held by

		companies controlled by a director relative to the total number of ordinary shares outstanding
FCF	Free cash flow	Dummy variable: 1 where market to book assets is less than the median and cash flows from operations/total assets is greater than median
GEOGRAPHIC	International diversification	Number of geographic segments
INDUSTRY	Line of business diversification	Number of reported industry segments (excluding "general corporate")
INHOLD	Inside ownership	Percentage of ordinary stock beneficially held by executive and gray directors (i.e., directors other than outsiders)
MAJORITY	Majority shareholder	1 if there is a shareholder with more than 50% of the ordinary shareholder share capital, 0 otherwise
MBA	Growth opportunity	The ratio of market value of equity plus the book value of debt to the book value of total assets
PE	Growth opportunity	Market price per share divided by earnings per share
SIZE	Firm size	Natural logarithm of total assets
TENURE	CEO tenure	Number of years that the CEO has served as a director

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