



**Faculty of Business and Law**

**SCHOOL OF ACCOUNTING, ECONOMICS AND FINANCE**

**School Working Paper - Economic Series 2006**

**SWP 2006/11**

**DIRECTORS' REMUNERATION AND PERFORMANCE IN  
AUSTRALIAN BANKING**

**Hristos Doucouliagos, Saeed Askary and Janto Haman**

The working papers are a series of manuscripts in their draft form. Please do not quote without obtaining the author's consent as these works are in their draft form. The views expressed in this paper are those of the author and not necessarily endorsed by the School.

# **DIRECTORS' REMUNERATION AND PERFORMANCE IN AUSTRALIAN BANKING**

**Hristos Doucouliagos,\* Saeed Askary and Janto Haman**

School of Accounting, Economics and Finance,  
Faculty of Business and Law, Deakin University

\* Corresponding author: 221 Burwood Hwy, Burwood, Victoria 3125, Australia.  
Tel: + 61 (0)3 9244 6531; Fax: + 61 (0)3 9244 6064; e-mail: [douc@deakin.edu.au](mailto:douc@deakin.edu.au)

# **DIRECTORS' REMUNERATION AND PERFORMANCE IN AUSTRALIAN BANKING**

## **Abstract**

This paper explores the relationship between directors' and Chief Executive Officers' pay and performance within Australian banking, using panel data for the 1992-2005 period. Several earnings models are estimated, using different dependent variables, alternate measures of performance and different estimation techniques. The results indicate an absence of a contemporaneous relationship between directors' pay and firm performance, and no association with prior year performance. However, there is a more distant pay-performance relationship, with total directors' pay having a robust positive association with earnings per share lagged two years, as well as with ROE lagged two years. The other key determinants of directors' pay in Australian banking are bank specific managerial policies, lags in the administration of pay, bank size, directors' age and directors' stock ownership. In contrast to total directors' pay, the evidence confirms a strong positive and direct association between CEO remuneration and prior year bank performance. The pay-performance association is stronger and more direct for CEO remuneration than it is for total directors' remuneration. The responsiveness of CEO pay with respect to bank performance appears to have increased over time.

**Keywords:** Corporate Governance, Directors' Remuneration, Pay and Performance.

# DIRECTORS' REMUNERATION AND PERFORMANCE IN AUSTRALIAN BANKING

## 1. Introduction

A substantial and influential literature has emerged on CEO compensation and the performance of corporate entities.<sup>1</sup> Relatively little is known however about the determinants of the pay of other senior personnel. For example, there exist only a handful of empirical studies that explore the relationship between directors' pay and performance (e.g. Main, Bruce and Buck 1996; Wan, Ong and Tung 2000; and Stathopoulos, Espenlaub and Walker 2004). While several studies have explored CEOs' remuneration in Australia (e.g. Izan, Sidhu and Taylor 1998; and Fleming and Stelliou 2002), there are no existing studies on the determinants of board remuneration using Australian data. Pay is an important mechanism for soliciting effort, rewarding productivity and ensuring compliance with owners' interests. Hence, the dearth of information on the directors' pay-performance association is surprising, especially given the amount of publicity in Australia regarding the remuneration of senior personnel.

The issue of executive and director's pay has attracted the interest of both the Australian public and policy makers (Woldring 1995, Hill and Myablon 2002 and Brown and Samson 2003). Understandably, it has attracted also the interest of the Australian Stock Exchange (ASX). According to "the nine principles and recommended best practices" issued by the corporate council of the ASX, corporate entities are required to ensure that the level of composition of remuneration is sufficient and reasonably linked with the performance level of directors (Fraser, 2003).

The aim of this paper is to contribute to our understanding of pay and performance in Australian corporations, by investigating empirically the determinants of board directors' pay in Australian banking. We investigate also the determinants of CEOs' pay, and compare the pay-performance relationship between these two parts of the managerial hierarchy.

We deliberately focus on Australian banking for two reasons. First, Australian banks receive significant scrutiny from investors, the financial press and the public in general. Banks such as the National Australia Bank, the Commonwealth Bank, Westpac and the Australian New Zealand Banking Group attract also the attention of non-Australian investors. Australian bank stocks are seen widely and correctly by the investment advisory community as an important part of a diversified portfolio, are held extensively by institutions, and form part of virtually all superannuation (pension fund) holdings. The deregulation of Australian banking has focused

---

<sup>1</sup> Examples include Murphy (1985), Jensen and Murphy (1990), Gregg *et al.* (1993), Main *et al.* (1996). See Rosen (1992) and Murphy (1998) for reviews of the empirical studies.

attention on the banks, principally in the light of controversies regarding bank operating hours, branch closures and bank fees. Moreover, like banks elsewhere, Australian banks are subject to significant regulatory control and supervision. While interventions such as deposit insurance and protection by Central Banks and monetary authorities lead to moral hazard problems (Macey and O'Hara 2003), it is also possible that the greater regulatory scrutiny may put extra pressure on banks to design optimal contracts.

Second, empirical investigations that involve organizations from different sectors are troubled with the need to account adequately for the inherent heterogeneity in the sample. This makes drawing statistical inferences more difficult. While individual organizational fixed effects are a vital factor in explaining heterogeneity, combining organizations from different industries imposes additional burden. By focusing on a single industry we can abstract from industry effects and focus purely on the impact of firm level differences. A similar industry specific approach has been adopted by Collins, Blackwell and Sinkey (1995) and Mishra and Nielsen (2000) for US banking.<sup>2</sup>

We investigate the pay-performance association for Australian banking, by using a panel dataset for all publicly traded Australian banks over the period 1992 to 2005. The dataset covers the remuneration packages of 265 directors, 30 of which are CEOs, resulting in a combined total of 1,419 years of remuneration observations. We make five contributions to the literature. First, we add to the relatively small pool of studies that informs on the pay-performance association in Australia. Second, we present estimates for both CEO and directors' remuneration and compare the pay-performance responses. Third, while most Australian studies use data relating to the 1980s and early 1990s, this study uses more recent data. Fourth, the extant Australian studies combine observations for many industries. Our study is more focussed by exploring only the banking sector. Finally, while the situation is changing, most studies have ignored the role of corporate governance as a factor in directors' remuneration. Given the justified global interest in corporate governance and its heightened importance in banking (see Macey and O'Hara 2003), it is desirable to explore empirically the impact of corporate governance on directors' pay.

The paper is structured as follows. Section 2 of the paper presents an overview of the theory relating to pay and performance, as well as a brief review of recent studies. The data and econometric methodology are discussed in section 3. The results are presented and discussed in section 4, followed by the summary and conclusions in section 5.

---

<sup>2</sup> There is some evidence to suggest that the degree of competition in Australian banks (especially smaller banks) is lower than it is in most other countries (see Bikker and Haaf 2002).

## 2. Theoretical Framework and Prior Studies

One of the most extensively debated issues in the corporate governance literature continues to be managerial compensation. Several theories have been developed to explain the process through which directors' remuneration is determined. These theories include agency theory, competition in executive labour markets, as well as a range of socio-economic and socio-psychological factors. Bender (2003) and Perkins and Hendry (2005) review some of these theories.

Empirical researchers tend to rely upon the theory of managerial compensation derived from agency theory and draw upon the principal-agent relationship (see Dogan and Smyth, 2002; Crespi-Cladera and Gispert, 2003). According to agency theory, the aim of compensation contracts is to reward managers in such a way that they strive to maximise firm performance and shareholders' wealth. However, factors such as institutional rules and markets, sectoral performance, firm or company size, and ownership structure moderate the board-shareholder relationship and consequently the pay-performance association.

A generic earnings function can be expressed as:

$$\ln(\text{earnings}) = f(e, Z) \quad (1)$$

where  $\ln$  is the natural logarithm,  $e$  is managerial effort and  $Z$  is a vector of variables other than performance that influence earnings. Crespi-Cladera and Gispert (2003) note that the principal-agent model can be represented as:

$$y = f(e, \varepsilon) \quad (2)$$

where the firm's performance,  $y$ , is a function of managerial effort ( $e$ ) and a set of variables ( $\varepsilon$ ) that are randomly distributed and which are not under managerial control. The principal-agent literature postulates that managers' compensation should be based on observable outcomes and that contracts should be designed to motivate the agents' best performance. Consequently, there should be a positive relationship between the managers' and executives' remuneration and firm performance. Using similar logic, we expect a positive association between non-executive directors' remuneration and performance.

Measuring individual managerial effort is not a simple matter. Researchers usually prefer to use proxies such as market valuation or accounting based measures of organisational performance. Moreover, shareholders are interested mainly in returns to their investments and, hence, are interested primarily in firm level performance. That is, what matters most for shareholders is not managerial effort *per se*, but the effort that translates into higher shareholder returns. Hence, an equation that can be used for estimation is:

$$\ln(\text{earnings})_{it} = \alpha_0 + \beta_y y_{it} + \gamma \sum Z_{it} + \omega_{it} \quad (3)$$

where  $y_{it}$  is firm performance and  $\omega$  is a random error term. Equation 3 relates directors' earnings to firm performance ( $y$ ) and other variables captured in the  $\mathbf{Z}$  vector.

In agency theory, the problem is to create an incentive structure that aligns shareholders' interests with managers' benefits. To achieve this target, a contract is usually proposed to managers, which contains compensation to managers for those variables of interest to shareholders (Jensen and Murphy 1990). In this framework, as performance improves, agents receive additional compensation. If firms design optimal contracts, then  $\beta_y$  (from equation 3) should be greater than zero.

The absence of a pay-performance association ( $\beta_y = 0$ ) does, of course, indicate that directors' remuneration is not tied to shareholders' interests. However, it does not necessarily follow that this situation arises entirely because of agency problems, with managers pursuing their own self-interest. Other forces may also be at work. For example, if banks design contracts that mandate managers to be responsible to broader interests and outside parties and consider stakeholders' interest (Marcy and O'Hara 2003), then this will water down the pay-performance association. In such cases, agency problems are observationally equivalent to contracts that consider a wider set of objectives. Izan *et al.* (1998, p. 45) note correctly that: "shareholders are not the only constituency that matters, and as with shareholders, the claims of other contracting groups of which the firm is comprised (e.g., creditors, customers, employees) are not fully specified. In such cases, a narrow focus on "optimal" contracting between shareholders' and top management may ignore important influences on the form such contracts take". Bender (2003) notes that various "isomorphic pressures" may lead to "homogeneity of companies' remuneration practices". Such pressures are independent of performance. Nevertheless, the lack of a pay-performance relationship should be of concern to shareholders. Finding no association between

directors' pay and productivity but a positive link between size and directors' pay, Conyon (1995, p. 167) concludes that: "One potential implication of such an observation is that directors have an incentive to increase company size (since this translates into personal economic rewards), which may not be in the long-term interests of shareholders."

## 2.1 Dynamics

It may at first appear that the pay and performance association should be contemporaneous. However, is it reasonable to assume that current pay is linked to current firm performance, or is it more reasonable to assume that there is at least a one year lag? There are, indeed, several reasons why lags will be a feature of the underlying data generating process.

First, the banks themselves acknowledge lags in the pay-performance association. For example, according to a National Australia Bank's *Annual Report* (2003, p. 35)<sup>3</sup>:

*Because the focus of the Board is on the long-term strategic direction of the Company, there is no direct link between non-executive director remuneration and the short-term results of the Company. The long-term performance of the Company, relative to other large corporations, is considered among other factors in setting the fee pool, which is periodically proposed to shareholders at the annual general meeting for approval.*

Second, remuneration contracts may contain an element of deferred compensation, resulting in a stretching of the pay-performance association (see Boschen and Smith 1995 for both theory and evidence). Third, the use of compensation consultants and comparisons of executive pay may also introduce delay in adjusting pay to performance. Fourth, remuneration includes provisions for pensions and retirement benefits. These are longer term components of compensation and may reflect performance over the course of a directors' tenure.<sup>4</sup>

The second important source of dynamics arises from the need to introduce a lagged dependent variable. Main *et al.* (1996) note that is important to consider these lags as they capture lags in the administration of pay. As Bender (2003, p. 208) states: "remuneration committees often have a figure given to them as a starting point, either previous years' pay, or salary surveys, and their judgement may be influenced by this anchor."

---

<sup>3</sup> An important extension to our research would be detailed case study analysis of actual remuneration policies and how these have evolved over time.

<sup>4</sup> However, these may end up to be a "gratuitous payment" having little to do with performance (Bebchuk and Fried 2003).



Consideration of the need for lags in order to identify the dynamics involved leads to the following general earnings function:

$$\ln(\text{earnings})_{it} = \alpha_0 + \beta_e \ln(\text{earnings})_{it-1} + \beta_y y_{it-n} + \gamma \sum Z_{it} + \omega_{it} \quad (4)$$

Equation 4 states that directors' earnings are influenced by past levels of earnings, current and past firm performance, and other variables that affect directors' pay.

## 2.2. *Prior studies*

Most of the early literature used models that focussed simply on the pay-performance association, without adding other control variables (e.g. Jensen and Murphy 1990 and Gibbons and Murphy 1990). These models were then extended by considering the impact of firm size on CEO and directors' pay. Examples include Conyon, Gregg and Machin (1995), Conyon (1998) and Conyon and Murphy (1998), Schaefer (1998), Yermack (2004) and Kato and Kubo (2006). Other researchers have included lagged pay as a regressor (Watson 1990, Main *et al.* 1996 and Wan *et al.* 2000). The newer literature includes corporate governance variables. For example, Conyon (1997) includes dummy variables for the presence of remuneration committees and whether the CEO is the chairman of the board. Conyon and Peck (1998) also explore the role of remuneration committees, as well as board composition. Cosh and Hughes (1997) explore the impact of institutional shareholdings and board composition. Stathopoulos *et al.* (2004) explore the impact of a range of corporate governance variables, such as board size, board composition, inside and outside stockholdings, and the presence of the CEO on remuneration committees. Ghosh and Sirmans (2005) include board size, age of directors, and ownership variables. Mishra and Nielsen (2000) test the impact of insider ownership and board independence. Fleming and Stellios (2002) investigate the impact of board composition (percentage of non-executive directors) and managerial stock ownership.

The extant empirical studies report conflicting evidence regarding the impact of directors' remuneration on firm performance. For example, Dogan and Smyth (2002) found no association between board remuneration and firm performance in publicly listed Malaysian companies. Crespi-Cladera and Gispert (2003) established a positive relationship between changes in company performance and board remuneration within Spanish listed companies.<sup>5</sup>

---

<sup>5</sup> One way to resolve the conflict in empirical findings is to use meta-analysis to derive a quantitative synthesis of the findings (see Stanley 2001).

Unfortunately, compared to U.S. and the U.K., there is a dearth of Australian studies.<sup>6</sup> The extant Australian studies can be divided into two broad groups. The first group consists of studies that used data relating to the 1980s and early 1990s. This group of studies in general failed to establish a pay-performance association. For example, Izan *et al.* (1998) use data on a sample of 99 Australian firms for the period 1987 to 1992 and find no link between CEO pay and performance. Defina, Harris and Ramsay (1995) use cross-sectional data for 89 firms for 1990 and also could not find a pay-performance link. Similar results were found by Evans and Stromback (1994) for the 1990-1991 period, and Fleming and Stellios (2002) for 86 firms for 1998.

The second and growing group of studies has used more recent data and found a positive association. Matolcsy (2000) explores a longer period (1987-95) and finds a positive association between management cash bonuses and observable compensation during periods of economic growth and no association during periods of recession. Using a slightly unconventional specification and a market based measure performance, Doucouliagos and Hoque (2005) found a positive association between CEO pay and performance. Merhebi, Swan and Zhou (2003) use data for 764 companies for the 1990-1999 period and find a robust positive association. Similarly, Clarkson, Nichols and Walker (2006) find a positive association for 336 Australian companies for the period 1998-2004. A plausible explanation for the difference in results between the two groups of studies is that disclosure differences may be driving these results (see Izan *et al.* 1998 and Clarkson *et al.* 2006). That is, the association may have always existed, but the data was too poor to pick this up.

### **3. Methodology and Data**

#### *3.1 Specification*

There is relatively little guidance for researchers on the appropriate specification for determining directors' pay. However, some regularity can be identified. First, following the work of Mincer (1974), researchers typically express the dependent variable of an earnings equation as the natural logarithm of pay/earnings. Second, the greater majority of studies control for the size of the firm. The larger the firm, the larger the complexity of the managerial decision making process and hence earnings tend to be higher. Third, earnings functions must include variables for productivity. Typically, this involves variables such as the age of employees, their educational background and a measure of performance. In the case of directors' remuneration, studies include either a market or accounting measure of performance. Other than these controls, however, there is no further

---

<sup>6</sup> Our focus here is on econometric based empirical analysis. Other studies have approached the issue from a different perspective. See, for example, Deegan (1997), Chiu and Monin (2003), Goodwin and Kent (2004) and Australian Council of Super Investors (2004).

guidance on the variables to use, or on the specification. Hence, while pay is logged, some studies use the level of the logs (Conyon *et al.*, 1995) while others apply a first difference filter (Main *et al.* 1996 and Crespi-Cladera and Gispert 2003). Our approach is to estimate several pay-performance equations, but for the sake of brevity we include only some of the key results.

In order to capture the pay-performance relationship adequately, it is necessary to introduce a range of control variables (the **Z** vector) that may reasonably be expected to determine pay, independently of performance. We list, in turn, the variables used in our empirical analysis.<sup>7</sup>

### *Remuneration*

The empirical investigation involves the use of three different measures of the dependent variable: (a) the natural logarithm of total directors' remuneration (which includes CEO pay); (b) the natural logarithm of CEOs' remuneration; and (c) the natural logarithm of CEOs' base (fixed) portion of remuneration. Total directors' remuneration includes fixed fees and salaries, bonuses and incentive based remuneration, as well as employer contributions to superannuation and retirement benefits. For CEOs, total remuneration includes also the value of stocks and options granted.<sup>8,9</sup>

### *Bank Performance*

There is a large literature on the relative merits of different measures of performance. We follow the extant literature and use both accounting based measures of performance, as well as market based ones.<sup>10</sup> There is also a sizeable literature on the measurement of bank performance (see Berger, Hancock and Humphrey 1993). The production process of banks differs markedly to that for other industries. Macey and O'Hara (2003) note that the key differences are: (a) banks receive most of their funding from debt with relatively little derived from equity; (b) on demand deposits make up the bulk of banks' liabilities; and (c) most of their assets are long-term loans. Accordingly, several measures of performance are available, including conventional measures such as Return on Assets (ROA) and Returns on Equity (ROE), as well as provision for loan losses. Nevertheless, bank specific studies (e.g. Mishra and Nielsen 2000) use conventional performance measures, as do studies that combine banks with other industries. ROA and ROE are used widely to assess bank performance (see, for example, Knapp, Gart and Becher 2005, Choi and Hasan 2005, and Shen and

---

<sup>7</sup> In unreported regressions, we tested the sensitivity of our results to the inclusion of other variables. For example, we considered stock price and shareholder return volatility, the CEO's gender, the proportion of board members who were female, the existence of remuneration committees and whether the CEO is also the chairman of the board. None of these variables was statistically significant.

<sup>8</sup> We do not attempt to make our own valuations of these, and simply use the values reported in Annual Reports.

<sup>9</sup> Pre-1998, disclosure on the components of CEO remuneration was limited. Most of the reporting was in the form of salary bands. We use the midpoint of the band as an estimate of the CEO pay.

<sup>10</sup> See Izan *et al.* (1998) and references therein for discussion on some of the key issues involved.

Chang 2006). Moreover, the use of ROA and ROE facilitates comparisons with other non-banking studies.

Accordingly, the key performance measures in our study are: return on assets (ROA); return on shareholder equity (ROE); earnings per share (EPS); and shareholder return measures of bank performance. We measure shareholder returns by considering both share price movements and dividends received.<sup>11</sup>

### *Firm size*

The association between firm size and board and CEO remuneration has attracted the attention of numerous researchers. Murphy (1985), Jensen and Murphy (1990), Gregg, Machin and Szymanski (1993) and Conyon (1997), all found that firm size to be an important control variable influencing managers' compensation levels. Logically, managers of large companies should be paid more than small size firms because of the difference in the degree of complexity of tasks and decisions that need to be completed, as well as potentially greater value placed on these decisions and, hence, greater reward received from making them.

All existing studies of directors' remuneration include a measure of firm size as a control variable and have generally found that this association holds. For firm size Main *et al.* (1996) use sales turnover data. Crespi-Cladera and Gispert (2003) adopt the logarithm of total sales turnover. Main *et al.* (1996) and Conyon (1995) employ the lagged value of size, while Crespi-Cladera and Gispert (2003) use the current value. Brunello, Graziano and Parigi (2001) use both revenue and employment to proxy for size. Cho (1985) discusses several proxies of bank size such as size of equity capital, size of deposits, total assets, number of countries of operation. For the Australian banks, we follow Mishra and Nielsen (2000) and use the logarithm of (real) total capital (as reported in Annual Reports) lagged one period. For sensitivity purposes, we use also bank revenues.<sup>12</sup>

---

<sup>11</sup> The focus of this paper is the impact of performance on board remuneration. However, it is possible for board remuneration to affect performance. This means that there is potentially a problem of endogeneity with respect to the association between performance and board remuneration. Ideally, a system of equations should be estimated that identifies the determinants of board remuneration, as well as the influences on performance. However, this is beyond the scope of the present paper. The approach adopted in this paper is thus to follow the literature and use the lagged value of performance as a control variable in the board remuneration equation. Moreover, as noted in section 2.1, the inclusion of lagged performance is justified on theoretical grounds. The use of lagged performance measures implies a recursive system and the estimation procedure presented in this paper is then valid.

<sup>12</sup> Total interest revenue can be used also as a measure of bank performance (see Bikker and Bos 2005).

### *Age*

Age is a proxy for experience and, hence, is expected to be an important factor for determining remuneration. As directors grow older, they accumulate more experience. The additional experience may contribute to both firm performance and more effective monitoring. A link between age and firm performance may, of course, not apply if shareholders focus solely on performance, and choose not to factor age when determining remuneration. Stathopoulos *et al.* (2004) note that older directors may be less effective and this implies that the average non-executive pay may be negatively associated to age.

### *Sectoral performance*

One of the major empirical predictions of agency theory is that shareholders' compare returns across organisations within the same industry, as well as across different sectors (Dogan *et al* 2002). A comparison of other managers' performance in the same sector provides additional information. Hence, we expect a positive relationship between board remuneration and firm performance relative to their sector (Alshimmiri, 2004). Previous studies in UK and US have found mixed support for this association (Brunello, *et al.* 1997, and Antle and Smith 1986). Dogan and Smyth (2002) rejected this hypothesis for Malaysian Listed Companies, finding that: "this result is consistent with having high ownership concentration to the extent that as shareholders are better placed to monitor managers there is less need to rely on industry or sector performance in determining compensation" (p.340).

### *Corporate Governance*

Given that our focus is on directors' remuneration, it is desirable to consider also the influence, if any, of corporate governance mechanisms on directors' pay. Specifically, we include six corporate governance variables. **Committees** is the number of committees established by the board. These typically include committees such as remuneration, audit, budget review and credit. **Interlocking** is measured as the proportion of board of directors who are also board members for other organizations. **Meetings** is the number of committee meetings (board and all other committees) actually attended by board members to the number of meetings held. **Board Size** is simply the total number of directors (both executive and non-executive directors). **Turnover** is measured as the number of new and departing directors as a ratio of board size. Finally, **Composition** is board composition measured as the ratio of executive to non-executive board membership.

When board turnover reflects market forces (e.g. competition for directors) we can expect a positive association between turnover and remuneration. However, if turnover results from other

factors (such as internal conflict) then no association with directors' pay need be established. The number of committees can be seen as a proxy for the complexity of board decision making. In general, the more committees, the more complex is that structure, and this complexity may be reflected in remuneration. Board meeting frequency is a proxy for directors' effort. In general, the higher is meeting frequency the more attentive are the directors and this may be linked to pay. We expect meetings frequency to increase board control and hence potentially moderating CEO pay. Interlocking can be seen as a proxy for directors' experience and relative demand for those directors. This too may affect their pay. Board composition is linked with board monitoring activities. We expect board composition to be inversely related to pay – the higher the proportion of non-executive directors the greater scrutiny on pay. *A priori*, we have no expectation about the impact of the other corporate governance variables on directors' pay. For example, interlocking may mean that directors are more experienced and, hence, potentially able to exercise more control. Interlocking may, however, also mean that they are distracted, thereby weakening board control.

### *Ownership*

The final set of variables is ownership structure. The percentage of stock owned by the top 20 shareholders is included as a proxy for outside monitoring. Outside owners can be expected to monitor board and firm performance and this can affect directors' earnings. Additionally, we explore the impact of directors' ownership by including the proportion of stock owned by directors, as well as the proportion of stock owned by the CEO. These variables are expected to have a negative effect on CEO compensation. However, if directors have relatively small stock holdings, then they may not have the incentive to monitor effectively CEO remuneration.

### *3.2 Descriptive Statistics*

As of 2006, there were 53 banks and authorised deposit taking institutions operating in Australia. Most of these, however, operate as foreign bank branches and subsidiaries with relatively very little market share, and so cannot be incorporated in this study (see <http://www.apra.gov.au/Statistics>). Our dataset relates to the 10 banks listed on the Australian stock exchange (ASX), as this group reports the requisite remuneration and corporate governance information. The 10 publicly listed banks and their ASX codes in brackets are: Adelaide Bank Limited (ADB), Australia & New Zealand Banking Group Limited (ANZ), Bank of Queensland Limited (BOQ), Bendigo Bank Limited (BEN), Commonwealth Bank of Australia (CBA), Macquarie Bank Limited (MBL), National Australia Bank Limited (NAB), St George Bank Limited (SGB), Suncorp-Metway

Limited (SUN), and the Westpac Banking Corporation (WBC).<sup>13</sup> In addition, we use data for the Bank of Melbourne (for the period 1992 to 1996) and Advance Bank (also for 1992 to 1996),<sup>14</sup> and Bank of Western Australia Limited (for the period 1995 to 2002).<sup>15</sup>

The data used in this study relate, for most banks, to the fourteen-year period spanning 1992 to 2005. The time period was chosen on the basis of four considerations. First, the data relates to the post-deregulation period of the financial and banking sector. Hence, there is no need to control for differences in the pre- and post-deregulation period. Second, this period is a post-recession period. Third, reporting standards are greater during this period than they were in earlier periods. This is particularly so for information regarding corporate governance. The amount of information has increased further since 1998 as a result of improved disclosure rules. Fourth, this period ensures the greatest possible number of cross-sections. This later factor is the most important for our study. The number of cross-sections for which the necessary data is available is significantly smaller during earlier periods. All the data was collected from the Annual Reports produced by the banks (we used mainly the Annual Report Collection to access these, as well as information from corporate websites).

There are a number of missing observations and, hence, we use an unbalanced panel dataset of 154 observations, which is smaller in most regressions because of missing observations for some control variables. Throughout our analysis we use data converted into real terms. Descriptive statistics of the key variables are presented in Table 1. A correlation matrix is presented in Appendix A.

#### **4. Results and Interpretation**

As noted earlier, the literature has not identified the appropriate specification for the determination of board remuneration. Accordingly, our approach is to estimate a range of models and thereby test the robustness of the results. In this paper we report two sets of results. First, we commence with a simple specification that involves regressing directors' pay against firm size and firm performance. A similar specification has been used by Conyon *et al.* (1995), Conyon (1998) and Conyon and Murphy (1998), among many others. This will be referred to as the *base* model. Second, we follow Main *et al.* (1996) and include lags in the administration of pay. In addition, we modify the base

---

<sup>13</sup> The official listing dates for each bank were as follows: ADB 28/5/1992, ANZ 30/9/1969, BEN 19/12/1985, BOQ 24/8/1971, CBA 12/9/1991, MBL 29/7/1996, NAB 1/1/1974, SGB 2/7/1992, SUN 7/7/1988, WBC 18/7/1970.

<sup>14</sup> Both banks were taken over by other banks and no longer exist as separate entities.

<sup>15</sup> The observations for BankWest stop at 2002, as BankWest is now part of the HBOS group, no longer produces an annual report and is no longer listed on the ASX.

model by introducing a vector of corporate governance variables as potential explanatory variables, and employ various lags in the pay-performance association.<sup>16</sup>

**Table 1: Descriptive Statistics of Key Variables, Australian Banks, 1992-2005**

Variable	Mean (Standard Deviation)	Variable	Mean (Standard Deviation)
<i>Dependent Variable (\$ millions)</i>			
Directors' Remuneration	\$4.1 (\$5.4)	CEO remuneration	\$1.3 (\$1.6)
<i>Firm Performance Measures (ratio)</i>			
Shareholder returns	0.17 (0.20)	ROA	0.008 (0.004)
EPS	0.77 (0.66)	ROE	0.129 (0.053)
<i>Corporate Governance Variables</i>			
Board Size (No.)	10 (3)	Committees (No.)	4 (2)
Meetings (%)	0.91 (0.14)	Interlocking (%)	0.84 (0.27)
Composition (%)	0.86 (0.12)	Board Turnover (%)	0.16 (0.16)
<i>Other Variables</i>			
CEO Age (Years)	52 (5)	Stock Owned by Directors (%)	1.11 (2.16)
Directors' Age (Years)	57 (5)	Stock Owned by non-executive directors (%)	0.93 (2.10)
Size (Assets \$m)	\$61,251 (\$75,519)	Stock Owned by CEO (%)	0.18 (0.39)
Size (Revenue \$m)	\$3,517 (\$3,974)	TOP20 (%)	43.59 (16.74)

**All financial variables expressed in real terms. All Averages calculated for the entire period.**

#### 4.1 The base model

Table 2 reports the results of estimating the base specification, using both OLS and Fixed Effects.<sup>17</sup> Note that each cell reports the pay-performance coefficients derived by running separate regressions using in turn five alternate measures of performance: current total shareholder return, lagged total shareholder return, lagged ROA, lagged ROE and lagged earnings per share.<sup>18</sup> The OLS results are reported for comparison purposes only. The explanatory power of the Fixed Effects models are superior to the OLS models (as measured by the adjusted R-squared).

<sup>16</sup> The results of just adding lags in administration of pay to the base model are available from the authors.

<sup>17</sup> The Random Effects estimator is not used as our dataset is based on the population of ASX listed banks.

<sup>18</sup> The full set of regression results are available from the authors.



Importantly, the Fixed Effects models are preferable as they control for vital firm specific effects.<sup>19</sup> Columns 1 to 4 use the natural log of total capital employed as the proxy for bank size. Columns 5 to 8 repeat the exercise using the natural log of bank revenue as the measure of bank size.

It is clear from the base model results reported in Table 2 that, in Australian banking, there does not exist a positive association between total directors' pay and either the current or one-year lag in bank performance.<sup>20</sup> The key drivers of total directors' pay appear to be bank size and bank specific effects. These appear to be more important than performance in directly determining directors' pay. However, EPS lagged twice is positive and statistically significant, regardless of the measure of firm size and method of estimation. The results for CEO pay are strikingly different. All of the lagged bank performance measures are positively related to CEO pay, when total assets is used to measure bank size and estimation is with Fixed Effects. Moreover, EPS, ROA and ROE lagged twice are also positively associated with CEO remuneration. EPS is also positively related to CEO pay when revenue is used as the measure of bank size. Like Mishra and Nielsen (2000), we deem total assets to be a more appropriate measure of firm size and, hence, we use this variable for the remainder of the paper.

---

<sup>19</sup> The estimates of the bank specific effects are available from the authors. Changing the dependent variable to the natural log of the *average* directors' remuneration (i.e. total directors' remuneration divided by the number of directors) does not change the essence of the results. These are available from the authors.

<sup>20</sup> Indeed, some of the estimates suggest a negative association.

**Table 2: Pay and Performance in Australian Banks 1992-2005, Base Models**  
**Dependent variable = ln(total directors' remuneration) or ln(CEO remuneration)**

Variables	DIR - OLS – (1)	DIR - FE – (2)	CEO - OLS – (3)	CEO - FE – (4)	DIR - OLS – (5)	DIR - FE – (6)	CEO - OLS – (7)	CEO - FE – (8)
ln(size) <sub>t-1</sub>	Always positive	Always positive	Always positive	Always positive	Always positive	Always positive	Always positive	Always positive
Shareholder returns <sub>t</sub>	0.38 (1.36)	0.04 (0.30)	1.01 (2.38)**	0.11 (0.69)	0.58 (1.95)*	0.08 (0.54)	1.32 (2.19)**	0.15 (0.63)
Shareholder returns <sub>t-1</sub>	-0.09 (-0.38)	-0.29 (-1.92)*	1.03 (2.61)**	0.35 (2.28)**	0.07 (0.26)	-0.24 (-1.37)	1.35 (2.41)**	0.40 (1.67)*
ROA <sub>t-1</sub>	0.11 (0.63)	-0.09 (-1.10)	0.61 (2.74)***	0.28 (2.71)***	0.15 (0.77)	-0.10 (-1.26)	0.76 (2.47)**	0.29 (1.55)
ROE <sub>t-1</sub>	0.01 (0.48)	-0.02 (-2.21)**	0.07 (5.16)***	0.03 (4.90)***	0.02 (0.82)	-0.01 (-1.07)	0.10 (4.78)***	0.04 (4.84)***
Earnings per share <sub>t-1</sub>	0.17 (0.92)	0.04 (0.19)	-0.18 (-0.70)	0.69 (4.65)***	0.26 (1.29)	0.28 (1.20)	-0.08 (-0.24)	1.07 (4.80)***
Shareholder returns <sub>t-2</sub>	-0.001 (-0.04)	-0.22 (-1.51)	0.71 (1.62)	-0.04 (-0.25)	0.25 (0.82)	-0.04 (-0.21)	1.19 (1.98)*	0.24 (0.81)
ROA <sub>t-2</sub>	0.16 (0.88)	0.01 (0.15)	0.56 (2.60)**	0.17 (1.87)*	0.24 (1.13)	0.01 (0.07)	0.72 (2.47)**	0.19 (1.28)
ROE <sub>t-2</sub>	0.02 (1.26)	-0.004 (-0.58)	0.07 (4.47)***	0.02 (3.09)***	0.02 (1.62)	-0.01 (-0.08)	0.09 (4.19)***	0.02 (2.93)***
Earnings per share <sub>t-2</sub>	0.24 (2.32)***	0.24 (2.61)**	-0.50 (-1.89)*	0.53 (4.03)***	0.22 (1.88)*	0.31 (2.76)***	-0.50 (-1.64)	0.75 (3.76)***

Notes: \*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively. White Heteroscedasticity-Consistent standard errors used throughout. Each cell reports the coefficients from different base regressions. Fixed Effects statistically significant but not reported. DIR = total directors' remuneration. CEO = CEO remuneration. Columns 1 to 4 use total assets as the measure of bank size. Columns 5 to 8 use revenue to measure bank size. All variables expressed in real terms

#### 4.2 *The full model*

The problem with the base specification is that it ignores lags in the administration of pay and also ignores corporate governance dimensions. Accordingly, we extend the base model by including a wider set of control variables. Table 3 reports the results of modifying the specification of the base model, with ROA as the measure of performance and total directors' compensation as the dependent variable (the results using average directors' remuneration are available from the authors). The bottom panel of Table 3 reports the pay-performance coefficients associated with using different measures of performance, as well as various lags in the pay-performance relationship. Column 1 presents the results of adding the lagged dependent variable ( $\text{dirpay}_{t-1}$ ). The lagged dependent variable captures the dynamics in the data generating process. This variable has the expected positive coefficient and is statistically significant. With the exception of  $\text{EPS}_{t-1}$ , none of the other performance measures indicate a positive pay-performance association.

Column 2 adds relative market performance, as well as the average age of the directors. Labour economists argue that age is a proxy for experience and should be an important driver of pay. We include also a non-linear term to capture life cycle pay effects. The age variables are statistically significant, indicating that holding other factors constant, on average, directors' age actually has a negative effect on pay. Older directors are paid less than younger ones. In Column 3, we add two ownership variables: the proportion of stock owned by the top 20 shareholders and the proportion of stock owned by all directors. In column 4, we add the six corporate governance variables: board size, proportion of non-executive directors (board composition), interlocking, meetings frequency, the number of committees, and turnover of directors.

Regardless of the specification, none of the ROA variables are statistically significant. The shareholder returns variable has the wrong sign. However, both  $\text{EPS}_{t-2}$  and  $\text{ROE}_{t-2}$  have a robust positive and statistically significant association with total directors' pay. Columns 5 and 6 of Table 3, present the results of using  $\text{EPS}_{t-2}$  and  $\text{ROE}_{t-2}$  to measure performance. For sensitivity purposes, Appendix B presents the results of applying a general-to-specific modelling strategy whereby statistically insignificant variables are sequentially eliminated.<sup>21</sup> From Table 3 we see that the key drivers of total directors' pay in Australian banking are the size of the bank, the age of directors, directors' total stock ownership, lags in pay and lagged bank performance as measured by either EPS and ROE.<sup>22</sup>

---

<sup>21</sup> This approach was not applied to ROA as it was never statistically significant.

<sup>22</sup> Appendix B shows that board size is also an important factor. Note however that since the dependent variable is total directors' remuneration, it is no surprise that board size is positively correlated with pay. When the dependent variable is expressed as the natural logarithm of average directors' remuneration, the same set of variables emerges as statistically significant, but board size does not. Specifically the coefficients (and t-statistics) are: bank size = 0.36 (3.42);  $\text{EPS}_{t-2}$  = 0.36 (4.40); lagged directors pay = 0.30 (2.11); directors' stock ownership = 0.04 (3.06); age = -0.17 (-1.40); age squared = 0.002 (1.54); and board size = -0.03 (-1.12).

**Table 3: Determinants of Australian Bank Directors' Pay 1992-2005, Fixed Effects**  
**Dependent variable = ln(total directors' compensation)**

Variables	(1)	(2)	(3)	(4)	(5)	(6)
ln(dirpay) <sub>t-1</sub>	0.37 (2.78)***	0.31 (2.11)**	0.28 (1.93)*	0.26 (1.75)*	0.28 (1.84)*	0.29 (1.89)*
ln(Size <sub>t-1</sub> )	0.37 (4.71)***	0.42 (4.22)***	0.41 (4.30)***	0.45 (3.73)***	0.36 (2.82)***	0.44 (3.59)***
ROA <sub>t-1</sub>	-0.12 (-0.84)	-0.12 (-0.71)	-0.03 (-0.17)	0.04 (0.23)	-	-
Market <sub>t-1</sub>	-	-0.05 (-0.33)	-0.09 (-0.52)	-0.16 (-0.84)	-0.14 (-0.82)	-0.17 (-1.02)
Average Age of Directors	-	-0.28 (-2.91)***	-0.27 (-2.78)***	-0.26 (-2.23)**	-0.13 (-0.95)	-0.25 (-2.21)**
Average Age of Directors squared	-	0.001 (3.08)***	0.003 (2.96)***	0.003 (2.42)**	0.001 (1.14)	0.003 (2.42)**
Top 20	-	-	0.002 (0.84)	0.001 (0.12)	0.004 (1.15)	0.001 (0.09)
Directors' Ownership	-	-	0.055 (4.13)***	0.05 (3.70)***	0.06 (4.34)***	0.05 (4.31)***
<sub>t-1</sub> Board Composition	-	-	-	-0.82 (-0.75)	-0.59 (-0.56)	-0.69 (-0.68)
Board Size	-	-	-	0.02 (0.81)	0.05 (1.80)*	0.03 (1.14)
Committees	-	-	-	-0.06 (-1.06)	-0.06 (-1.11)	-0.06 (-1.01)
Interlocking	-	-	-	0.07 (0.20)	0.01 (0.02)	0.17 (0.44)
Meetings	-	-	-	-0.63 (-0.71)	-0.88 (-0.81)	-0.38 (-0.35)
Turnover	-	-	-	0.17 (0.77)	-0.02 (-0.10)	0.11 (0.50)
N	149	132	132	131	129	127
Adjusted R-squared	0.82	0.80	0.80	0.79	0.81	0.80

*Alternate Measures of Performance*

Shareholder return <sub>t-1</sub>	-0.29 (-1.75)*	-0.22 (-1.15)	-0.11 (-0.70)	-0.13 (-0.57)	-	-
ROE <sub>t-1</sub>	-0.01 (-0.86)	-0.01 (-0.65)	-0.003 (-0.23)	0.002 (0.21)	-	-
EPS <sub>t-1</sub>	-0.03 (-0.15)	-0.10 (-0.50)	-0.02 (-0.11)	0.12 (0.66)	-	-
ROA <sub>t-2</sub>	0.05 (0.66)	0.04 (0.54)	0.06 (0.67)	0.06 (0.82)	-	-
Shareholder return <sub>t-2</sub>	-0.12 (-0.73)	-0.10 (-0.60)	-0.06 (-0.39)	-0.14 (-0.82)	-	-
ROE <sub>t-2</sub>	0.01 (0.79)	0.01 (1.95)*	0.01 (2.54)**	0.01 (2.59)**	-	0.01 (2.59)**
EPS <sub>t-2</sub>	0.27 (3.13)***	0.26 (3.65)***	0.32 (4.77)***	0.40 (3.65)***	0.40 (3.65)***	-
ROA <sub>t-3</sub>	-0.02 (-0.42)	-0.04 (-0.83)	-0.03 (-0.53)	-0.01 (-0.20)	-	-
Shareholder return <sub>t-3</sub>	-0.41 (-1.86)*	-0.41 (-2.14)**	-0.39 (-2.05)**	-0.45 (-2.08)**	-	-
ROE <sub>t-3</sub>	-0.01 (-0.23)	0.01 (0.11)	0.001 (0.27)	0.003 (0.66)	-	-
EPS <sub>t-3</sub>	0.02 (0.12)	-0.05 (-0.35)	-0.03 (-0.20)	0.04 (0.27)	-	-

Notes: \*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively. White Heteroscedasticity-Consistent Standard Errors used. Fixed Effects statistically significant but not reported. N = sample size.

Total directors' remuneration obviously includes also remuneration of non-executives. Non-executive directors play an important function in scrutinizing management performance. They are also responsible for determining the remuneration of executive directors. Non-executive directors typically receive an annual fee and attendance fees, as well as retirement benefits. The remuneration of non-executive directors is usually fixed by shareholders at the Annual Meeting and evidently this is not based on recent performance. The results do, however, indicate that non-executive directors' pay is influenced by longer time lags in performance, with a two period lag in performance. Our results suggest that a pay-performance relationship in Australian banks is more complex than what has been found for other industries in most prior studies. Pay may be linked to performance but with relatively longer lags.

Following Core, Holthausen and Larcker (1999), CEO remuneration is modelled as a function of economic variables and corporate governance variables. We use the same set of performance measures, and variables capturing bank size and corporate governance, as reported in Table 3. The results for CEO remuneration are reported in Table 4. Once again, the lower panel presents the pay-performance coefficients arising from re-estimating using alternate performance measures. In order to facilitate comparisons with total directors' pay, Columns 1 to 4 mimic columns 1 to 4 of Table 3. Column 5 extends this by including several additional variables. First, we allow directors' stockholdings to influence CEO pay in a non-linear fashion by including directors' ownership squared. Second, we introduce the proportion of stock owned by the CEO as a separate variable.<sup>23</sup> Third, we add both the CEO's age as well as the average age of directors.<sup>24</sup>

The results reveal strong support for a pay-performance association for Australian banking CEOs. ROE, ROA and EPS lagged once are all positively and statistically significantly related to CEO compensation. EPS lagged twice is also related to CEO compensation, as it was with total directors' pay.

The statistical insignificance of shareholder returns variable presented in Table 4 is actually not surprising. The market performance variable (**Market**) is measured as movements in bank shareholder returns relative to those for the banking sector as a whole. This variable has a positive effect on CEO remuneration. If the results reported in Column 5 Table 4 are reproduced by

---

<sup>23</sup> Note that in Table 4 the directors' stock ownership variable does *not* include CEO stock holdings, while it does in the results presented in Table 3.

<sup>24</sup> The general-to-specific modelling results for CEO remuneration are presented in Appendix B, columns 3 to 5.

replacing ROA with shareholders returns *and* removing market performance, the coefficient on shareholders returns becomes 0.25, with a t-statistic of 2.47. That is, CEO pay is responsive to all five measures of performance.<sup>25</sup>

---

<sup>25</sup> We tested also various autoregressive distributed lag models by, for example, adding several lags in both the dependent and independent variables. These impose additional costs in terms of degrees of freedom and the additional lags did not, in the majority of cases, appear to be statistically significant. For example, when one, two and three year lags of ROA are regressed on CEO pay, using the specification of Column 4 Table 4, the coefficients (and associated t-statistics) are:  $ROA_{t-1}=0.45$  (7.80);  $ROA_{t-2}=0.08$  (1.65); and  $ROA_{t-3}=0.05$  (1.13). A Wald test indicates the statistical non-significance of the two and three year lags ( $\chi^2=3.55$ , p-value=0.17). Similar results hold when the ADL is re-estimated with a one and two year lag. However, an ADL with one and two year lags in EPS produces the following results:  $EPS_{t-1}=0.36$  (1.90) and  $EPS_{t-2}=0.42$  (3.67). A Wald test indicates that the two are jointly statistically significant ( $\chi^2=31.23$ , p=0).

**Table 4: Determinants of Australian Bank Directors' Pay 1992-2005, Fixed Effects**  
(Dependent variable = ln(CEO compensation))

Variables	(1)	(2)	(3)	(4)	(5)
ln(CEOpay) <sub>t-1</sub>	0.43 (4.13)***	0.36 (3.32)**	0.38 (3.93)***	0.32 (3.81)***	0.31 (4.05)***
ln(Size) <sub>t-1</sub>	0.55 (6.23)***	0.59 (6.42)***	0.51 (5.56)***	0.52 (6.08)***	0.55 (6.27)***
ROA <sub>t-1</sub>	0.33 (5.28)***	0.38 (6.58)***	0.50 (7.04)***	0.41 (8.71)***	0.41 (5.23)***
Market <sub>t-1</sub>	-	0.22 (1.82)*	0.18 (1.74)*	0.23 (1.97)*	0.25 (2.20)***
CEO Age	-	-0.03 (-0.20)	0.04 (0.36)	-0.20 (-1.86)*	-0.38 (-2.35)**
CEO Age squared	-	0.0004 (0.26)	-0.000 (-0.19)	0.002 (2.17)**	0.004 (2.55)**
Top 20	-	-	0.01 (1.89)*	0.01 (1.93)*	0.01 (2.46)**
Directors' Ownership <sub>t-1</sub>	-	-	0.08 (4.61)***	0.09 (5.07)***	0.18 (2.43)**
Board Composition	-	-	-	0.70 (0.85)	0.43 (0.59)
Board Size	-	-	-	-0.06 (-3.14)***	-0.07 (-3.71)***
Committees	-	-	-	0.04 (1.23)	0.04 (1.45)
Interlocking	-	-	-	-0.13 (-0.45)	-0.53 (-1.56)
Meetings	-	-	-	0.46 (1.02)	0.43 (0.70)
Turnover	-	-	-	0.16 (1.21)	0.24 (1.90)*
Directors' Ownership Squared	-	-	-	-	-0.008 (-1.19)
Average Age of Directors	-	-	-	-	0.05 (4.50)***
CEO Ownership	-	-	-	-	-0.14 (-0.75)
N	147	131	131	135	131
Adjusted R-squared	0.87	0.87	0.87	0.89	0.89

*Alternate Measures of Performance*

Shareholder return <sub>t-1</sub>	0.31 (2.88)***	0.11 (0.39)	0.11 (0.42)	0.26 (1.12)	0.48 (1.64)
ROE <sub>t-1</sub>	0.02 (3.93)***	0.02 (4.19)***	0.02 (3.63)***	0.02 (3.69)***	0.019 (2.49)**
EPS <sub>t-1</sub>	0.47 (3.31)***	0.54 (3.06)***	0.58 (2.83)***	0.51 (2.88)***	0.44 (2.39)**
ROA <sub>t-2</sub>	0.06 (1.13)	0.07 (1.17)	0.07 (1.12)	0.05 (0.63)	0.03 (0.43)
Shareholder return <sub>t-2</sub>	-0.20 (-1.54)	-0.10 (-0.66)	-0.09 (-0.60)	-0.14 (-1.04)	-0.12 (-1.23)
ROE <sub>t-2</sub>	0.01 (1.48)	0.01 (1.56)	0.01 (1.48)	0.01 (1.13)	0.004 (0.61)
EPS <sub>t-2</sub>	0.34 (3.02)***	0.41 (3.53)***	0.42 (3.51)***	0.40 (3.32)***	0.35 (2.70)***
ROA <sub>t-3</sub>	0.07 (1.71)*	0.07 (1.65)	0.07 (1.61)	0.02 (0.36)	0.003 (0.05)
Shareholder return <sub>t-3</sub>	0.08 (0.59)	0.02 (0.16)	0.04 (0.32)	-0.04 (-0.33)	-0.01 (-0.09)
ROE <sub>t-3</sub>	0.01 (1.62)	0.01 (1.76)*	0.01 (1.73)*	0.006 (0.89)	0.004 (0.65)
EPS <sub>t-3</sub>	0.11 (1.17)	0.14 (1.25)	0.15 (1.37)	0.09 (0.73)	0.10 (0.71)

Notes: \*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively. White Heteroscedasticity-Consistent Standard Errors used. Fixed Effects statistically significant but not reported. N = sample size.

As was established for the total and average directors' remuneration analysis above, lagged pay and bank size both have positive and statistically significant coefficients. The major difference between CEOs' and directors' remuneration, however, is the significance of the performance variables. These results are heartening and indicate that pay in at least one dimension of senior managerial hierarchies is influenced directly by performance.

Earnings functions can be used to inform on the responsiveness of earnings to performance. The short run elasticity of CEOs' pay with respect to performance as measured by ROA is 0.41. That is, a one percent increase in shareholder returns increases CEO pay by, on average, 0.41 percent. The long run elasticity of CEOs' pay with respect to performance is 0.60.<sup>26</sup> This is a solid connection between pay and performance. For example, a 10 percent increase in bank performance results in a 6.5 percent raise in CEOs pay.

### *Comparisons*

Our final analysis involves three important comparisons. First, we can compare the pay-performance over time. Figure 1 traces the changes in the pay-performance association over the period 1998 to 2005.<sup>27</sup> The figure plots the coefficient associated with the  $ROA_{t-1}$  variable, derived from recursively re-estimating the model reported in Column 5, Table 4. As can be seen from Figure 1, the pay-performance association (as measured by ROA) has been rising steadily. That is, the pay-performance association for CEO remuneration was stronger in 2005 than it was in 1998. However, this conclusion is not robust to the measure of performance. Thus, when ROE is used, the coefficient is stable over time, indicating no change in the magnitude of the positive pay-performance association. For total directors' pay, the coefficients for both  $EPS_{t-2}$  and  $ROE_{t-2}$  have both been increasing throughout the 2000s. Hence, the evidence suggests that depending on the performance measure used, the pay-performance association in Australian banking is either constant or getting stronger over time.

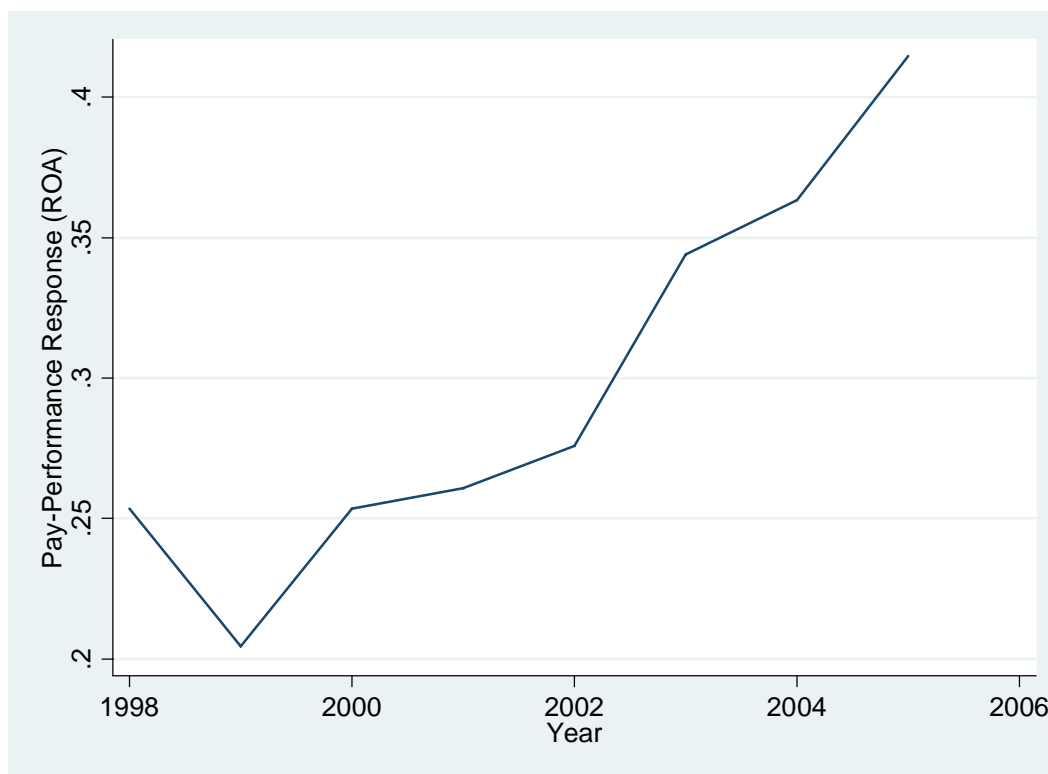
---

<sup>26</sup> This is calculated by considering the coefficient on the lagged dependent variable: long run elasticity =  $0.41/(1-0.31)$ .

<sup>27</sup> Note that for each of these recursive estimates, the coefficient on performance is always statistically significant. That is, the statistical significance of the pay-performance association is *not* an artifact of sample selection.



**Figure 1: The Strengthening Pay-Performance Association,  
Australian Banking, 1998-2005**



Second, we can compare the pay-performance association across different pay categories and different directors. A comparison of the coefficients reported in Table 3 and Table 4 indicates that the pay-performance association is similar for both CEO and total directors' remuneration in terms of  $EPS_{t-2}$ , but is stronger for CEO remuneration in terms of the other measures of performance.

Table 4 reports the results for total CEO compensation. Some authors argue that the fixed salary element of remuneration will not be sensitive to performance. Rather, it is expected to be driven by factors relating to pay comparisons arising from the executive labour market (Ogden and Watson 1996). In order to test this hypothesis, we estimated also separate pay regressions for base (fixed) CEO pay. The base pay regressions generally cover the period 1998/99 to 2005, as only total remuneration was available prior to that period.<sup>28</sup> Hence, they use a smaller dataset and should be interpreted with more caution. The coefficients are reported in Table 5 in the form of total

<sup>28</sup> We use the coefficients from the general equation CEO pay (Column 5, Table 4) and the general CEO base pay equation (not reported) with all explanatory variables, to construct Table 5. If a more basic regression is used, regressing bank size and bank performance on CEO base pay, the coefficients are for:  $ROA_{t-1}$  (0.36,  $t=3.13$ );  $ROE_{t-1}$  (0.028,  $t=2.61$ );  $EPS_{t-1}$  (-0.009,  $t=-0.10$ ); and shareholders returns  $_{t-1}$  (0.40,  $t=3.68$ ).

effects taking into account adjustments of pay over time. Base pay is insensitive to ROA, EPS and shareholder returns. However, base pay does respond to ROE, as well as to relative market performance. The results show that as expected, total pay is more responsive to bank performance than is base pay. However, our results show that the base pay is also linked to some measures of performance.

**Table 5: Total Pay-Performance Effects, CEO Base and CEO Total Pay, Australian Banking**

	ROE <sub>t-1</sub>	ROA <sub>t-1</sub>	Shareholder Returns <sub>t-1</sub> *	EPS <sub>t-1</sub>	Market <sub>t-1</sub>
<b>Base Pay</b> (n=66)	0.02	0.00	0.00	0.00	0.21
<b>Total Pay</b> (n=131)	0.03	0.60	0.73	0.65	0.36

Notes: Each cell reports total effects derived from separate remuneration regressions. Base Pay effects derived from a general model with base pay and lagged dependent variable in base pay, and same set of controls as in Column 5, Table 4. All effects are statistically significant at least at the 10% level of significance. \* The Market variable was removed from this model.

Third, we can compare with existing Australian studies. As noted in section 2.2, the earlier Australian studies were unable to establish a positive pay-performance association. Our study thus differs from this group, but it is consistent with the newer (and largely as yet unpublished studies) that uses more recent data.

Turning to the corporate governance variables, we find that board size has a negative effect on pay. Larger boards pay less. The board size effect was established also by Stathopoulos *et al.* (2004) for the United Kingdom. Fleming and Stellios (2002) found that the proportion of non-executive directors had a negative effect on CEO pay. Our results suggest that this does not appear to be the case with respect to Australian banking. Fleming and Stellios (2002) also found that managerial stock ownership had a negative effect on CEO pay. Our results indicate a much more complicated set of associations. When the full specification is used, CEO ownership does not appear to be an important factor in CEO remuneration. However, in the specific models (Appendix B), the results show that CEO ownership has a negative effect on CEO pay. Contrary to previous findings, our results suggest that CEO pay has a positive association with both outside and non-executive stock ownership. The positive association between institutional ownership and larger CEO pay may be due to the solid performance of the Australian banking sector over the period studied, with large outside stock holders rewarding CEOs over this period. The non-executive effect may be driven by relatively low stock holdings. Our results also show that the CEO pay-

directors ownership association is non-linear.<sup>29</sup> At low levels of directors' ownership, CEO pay increases. At higher levels, however, directors' ownership exerts a negative effect on CEO pay. This effect, however, does not kick in until about 10% of stock is owned in total by non-executive directors.<sup>30</sup> The other variable that is of significance is directors' age. Our results suggest that as directors age, CEO pay rises. This may occur if older directors exert less effective control over the CEO.

## 5. Summary and Conclusions

Relatively little is known about the determinants of directors' pay in Australia. The aim of this paper was to identify the determinants of board remuneration using panel data on Australian banks. Important determinants of directors' pay are the size of the bank (positive association), lagged values of directors' pay (positive association), age (negative association) and bank specific effects. Australian directors' pay does not appear to be linked to performance with a one year lag. However, there is evidence of longer links between directors' pay and performance, with the existence of a two year lag in the association, on average across Australian banks. The availability of more time series data in the future will enable further investigation of the lags involved in the directors' pay-performance association.

The situation is different with respect to CEOs. For this part of the managerial hierarchy, the evidence is indicative of a solid pay-performance relationship. These results confirm that the pay-performance relationship for CEOs is more direct, while that for directors' arises over a longer time horizon.

Our findings should be encouraging to the large proportion of the Australian public that owns shares in Australian banks, as well as to non-Australian investors. A common theme in this literature is that the relationship between pay and performance within the top 100 Australian companies (this includes the banking sector) is weak (e.g. Izan *et al.* 1998). One reason advanced for a weak pay-performance relationship is the board-capture theory. Our results suggest that at least in the Australian banking, boards are not captured by CEOs. CEO pay is directly linked to performance, and directors are remunerated on the basis of past performance. Australian banks appear to be managed in a manner that is consistent with wealth maximisation. The results should be comforting also to policy makers concerned with the efficiency of Australian industry. An

---

<sup>29</sup> Note that the two directors' ownership variables in Column 5 of Table 4 are jointly statistically significant ( $\chi^2=27.46$ ,  $p=0.00$ ).

<sup>30</sup> This occurs in only one relatively small bank in our sample and, hence, is a rare event.

important extension of the current study is to explore the pay-performance association among other executives in Australian banking, as well as to undertake other industry specific pay-performance investigations.

## 6. References

- Alshimmiri, T., (2004), "Board composition, executive remuneration, and corporate performance: the case of REITS", *Corporate Ownership & Control*, 2(1):104-118.
- Antle, R. and A. Smith, 1986, "An empirical Investigation of the Relative Performance Evaluation of Corporate Executives", *Journal of Accounting Research*, 24:1-32.
- Annual Report Collection, (see <http://www.deakin.edu.au/library/>).
- Australian Council of Super Investors, Inc. 2004. *CEO Pay in the Top 100 Companies, 2002*, Melbourne.
- Australian Prudential Regulation Authority, (see <http://www.apra.gov.au/Statistics>).
- Bebchuk, L.A. and Fried, J.M. 2003. "Executive Compensation as an Agency Problem", *Journal of Economic Perspectives*, 17(3):71-92.
- Bender, R. 2003. "How Executive Directors' Remuneration is Determined in Two FTSE 350 Utilities", *Corporate Governance*, 11(3):206-17.
- Berger, A., Hancock, D. and Humphrey, D. 1993. "Bank Efficiency Derived from a Profit Function", *Journal of Banking and Finance*, 17(2):317-47.
- Bikker, J.A. and Haaf, K. 2002. "Competition, Concentration and their Relationship: An empirical analysis of the banking industry", *Journal of Banking and Finance*, 26(11):2191-2214.
- Bikker, J.A. and Bos, J.W.B. 2005. "Competition and Efficiency in Banking: International Comparisons", *Economic and Financial Modelling*, 12(3):103-48.
- Boschen, J.F. and Smith, K.J. 1995. "You Can Pay Me Now and You Can Pay Me Later: The dynamic response of executive compensation to firm performance", *Journal of Business*, 68(4):577-608.
- Brown, M. and Samson, D. 2003. "Executive Remuneration: Balancing competing priorities", *Australian Economic Review*, 36(3):316-23.
- Brunello, G, Graziano, C. and Parigi B. 2001. "Executive Compensation and Firm Performance in Italy". *International Journal of Industrial Organization*, 19(1-2):133-61.
- Cho, K.R. 1985. *Multinational Banks: Their identities and determinants*. UMI Research Press.
- Choi, S. and Hasan, I. 2005. "Ownership, Governance, and Bank Performance: Korean Experience", *Financial Markets, Institutions and Instruments*, 14(4):215-41.

- Clarkson, P., Nichols, S. and Walker, J. 2006. "CEO Remuneration Disclosure, Corporate Governance and the Pay-to-Performance Link", University of Queensland, manuscript.
- Collins, M.C., D.W. Blackwell and J.F. Sinkey. 1995. "The Relationship between Corporate Compensation Policies and Investment Opportunities: Empirical evidence for large bank holding companies", *Financial Management*, 24:40-53.
- Canyon, M.J. 1995. "Directors' Pay in the Privatized Utilities", *British Journal of Industrial Relations*, 33:159-71.
- Canyon M.J. 1997. "Corporate Governance and Executive Compensation", *International Journal of Industrial Organisation*, 15:493-509.
- Canyon, M.J. 1998, "Directors' Pay and Turnover: An application to a sample of large UK firms," *Oxford Bulletin of Economics and Statistics*, 60(4): 485-507.
- Canyon M.J, Gregg, P. and Machin, S. 1995. "Taking Care of Business: Executive compensation in the United Kingdom" *Economic Journal*, May, 105:704-715.
- Canyon, M.J. and Murphy, K.J. 1998. "The Prince and the Pauper? CEO pay in the United States and United Kingdom", *Economic Journal*, F640-F671.
- Canyon, M.J. and Peck, S. I. 1998. "Board Control, Remuneration Committees, and Top Management Compensation", *Academy of Management Journal*, 41:146-157.
- Core, J.E., R.W. Holthausen and D.F. Larcker. 1999. "Corporate Governance, Chief Executive Officer Compensation, and Firm Performance", *Journal of Financial Economics*, 51:371-406.
- Crespi-Cladera R., and Gispert, C. 2003. "Total Board Compensation, Governance and Performance of Spanish Listed Companies" *Labour*, 17:103-126.
- Chiu, P and Monin, J. 2003. "Effective Corporate Governance: From the perspective of New Zealand fund managers" *Corporate Governance: An International Review*, 11:123-132.
- Cosh, A. and Hughes, A. 1997. "Executive Remuneration, Executive Dismissal and Institutional Shareholdings", *International Journal of Industrial Organization*, 15:469-92.
- Deegan, C. 1997. "Efficient Management Remuneration Plan Design: A consideration of specific human capital investments", *Accounting and Finance*, 37:1-40.
- Defina, A., Harris, T. and Ramsay, I. 1994. "What is Reasonable Remuneration for Corporate Officers? An empirical investigation into the relation between pay and performance in the largest Australian companies." *Company and Securities Law Journal*, 12:341-56.
- Dogan E, and Smyth R. 2002. "Board Remuneration, Company Performance, and Ownership Concentration: Evidence from Publicly Listed Malaysian Companies", *ASEAN Economic Bulletin*, 19:319-347.

- Doucouliaqos, C. and Hoque, M. 2005. "Corporate Governance and Australian Bank Stock Prices", *Journal of Business and Policy Research*, 1(1): 33-53.
- Evans, R. and Stromback, T. 1994. "Australian Executive Pay: An empirical analysis", Working Paper, Curtin University.
- Fraser, J. 2003. Australian Master Business Management Guide 2003/4, *CCH Australia Ltd*.
- Fleming, G and G. Stellios. 2002. "CEO Remuneration, Managerial Agency and Boards of Directors in Australia", *Accounting Research Journal*, 15:126-145.
- Ghosh, C. and Sirmans, C.F. 2005. "On REIT CEO Compensation: Does board structure matter?" *The Journal of Real Estate Finance and Economics*, 30(4):397-428.
- Gibbons, R. and Murphy, K. 1990. "Relative Performance Evaluation for Chief Executive Officers", *Industrial and Labor Relations Review*, 43:30S-51S.
- Gibbons, R. and Murphy, K. 1992. "Optimal Incentive Contracts in the Presence of Career Concern: Theory and evidence", *Journal of Political Economy*, 100: 468-505.
- Goodwin, J. and Kent, P. 2004. "The Incentives of Australian Companies to Utilize Executive Stock Option Plans", *Corporate Ownership and Control*, 1(2):137-49.
- Gregg, P., Machin, S., and Szymanski, S. 1993. "The Disappearing Relationship Between Directors' Pay and Corporate performance", *British Journal of Industrial Relations*, 31:1-10.
- Hill, J. and Myablon, C. 2002. "Corporate Governance and Executive Remuneration: Rediscovering managerial positional conflict", *University of New South Wales Law Journal*, 25(2):294-319.
- Izan, H.Y., Sidhu, B. and Taylor, S. 1998. "Does CEO Pay Reflect Performance? Some Australian Evidence", *Corporate Governance*, 6(1):39-47.
- Jensen M and Murphy K. J. 1990. 'Performance Pay and Top-management Incentives', *Journal of Political Economy*, 98:225-264.
- Kato, T. and Kubo, K. 2006. "CEO Compensation and Firm Performance in Japan: Evidence from panel data on individual CEO pay", *Journal of Japanese International Economies*, 20:1-19.
- Knapp, M., Gart, A. and Becher, D. 2005. "Post-Merger Performance of Bank Holding Companies, 1987-98", *The Financial Review*, 40:549-74.
- Matolcsy, Z.P. 2000. "Executive Cash Compensation and Corporate Performance During Different Economic Cycles", *Contemporary Accounting Research*, 17(4):6671-92.
- Macey, J R, and O'Hara, M. 2003, "The Corporate Governance of Banks", *Economic Policy Review*, 91-107.

- Main, B.G., A. Bruce and T. Buck. 1996. "Total Board Remuneration and Company Performance", *The Economic Journal*, 106:1627-44.
- Merhebi, R., Swan, P. and Zhou, X. 2003. "Australian CEO Remuneration: A non-anomaly in the global market", School of Business, University of Sydney, Seminar Paper.
- Mincer, J. 1974. *Schooling, Experience and Earnings*, New York: National Bureau of Economic Research.
- Mishra, C. S. and J. F. Nielsen. 2000. "Board Independence and Compensation Policies in Large Banks Holding Companies", *Financial Management*, 29(3):51-70.
- Murphy K.J. 1985. "Corporate Performance Pay and Managerial Remuneration: An empirical analysis", *Journal of Accounting and Economics*, 7:11-42.
- Murphy, K.J. 1998. "Executive Compensation". In, Ahsenfelter, O and Card, D. (eds), *Handbook of Labor Economics*, Vol. 3, North-Holland, Amsterdam, pp. 2485-563.
- Ogden, S. and Watson, R. 1996. "The Relationship between Changes in Incentive Structures, Executive Pay and Corporate Performance: Some evidence from the privatized water industry in England and Wales", *Journal of Business Finance and Accounting*, 23(5-6):721-51.
- Perkins, S.J. and Hendry, C. 2005. "Ordering Top Pay: Interpreting the signals", *Journal of Management Studies*, 42(7):1443-68.
- Rosen, S. 1992. "Contracts and the Market for Executives", *Contract Economics*, Edited by L. Werin and H. Wijkander, pp. 181-217. Oxford: Basil Blackwell
- Schaefer, S. 1998. "The Dependence of Pay-Performance Sensitivity on the Size of the Firm", *Review of Economics and Statistics*, 80(3):436-43.
- Shen, C-H. and Chang, Y-H. 2006. "Do Regulations Affect Banking Performance? Government governance may matter", *Contemporary Economic Policy*, 24(1):92-105.
- Stanley, T.D. 2001. Wheat From Chaff: meta-analysis as quantitative literature review. *The Journal of Economic Perspectives*, Vol. 15, pp. 131-150.
- Stapledon, G. 2004. "The Pay for Performance Dilemma", *University of Melbourne Legal Studies Research Paper No. 83*.
- Stathopoulos, K., Espenlaub, S. and Walker, M. 2004. "U.K. Executive Compensation Practices: New economy versus old economy", *Journal of Management Accounting Research*, 16:57-92.
- Yermack, D. 2004. "Remuneration, Retention and Reputation Incentives for Outside Directors", *The Journal of Finance*, vol. LIX(5): 2281-308.

- Wan, T.W., Ong, C.H. and Tung, P.K. 2000. "Directors Remuneration and Profitability Performance of Listed Companies in Singapore: A correlation and causality study", *Accounting Research Journal*, 13(2):37-46.
- Watson, R. 1990. "Employment Change, Profits and Directors' Remuneration in Small and Closely-Held UK Companies", *Scottish Journal of Political Economy*, 37(3): 1-274.
- Woldring, K. 1995. "The Ethics of Australian Executive Remuneration Packages", *Journal of Business Ethics*, 14:937-948.



## Appendix A: Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Assets	1.00																					
2. CEO age	0.21	1.00																				
3. CEo base pay	0.72	0.08	1.00																			
4. CEO ownership	-0.29	-0.04	-0.41	1.00																		
5. CEO total pay	0.46	0.18	0.19	-0.09	1.00																	
6. Committees	-0.09	-0.15	-0.29	-0.09	0.04	1.00																
7. Composition	-0.09	0.13	0.13	-0.06	-0.48	0.01	1.00															
8. Directors' ownership	-0.35	-0.01	-0.35	0.25	-0.18	0.06	0.09	1.00														
9. Directors' pay	0.50	0.20	0.22	-0.13	0.47	-0.12	-0.33	-0.20	1.00													
10. EPS	0.48	0.10	0.53	-0.08	0.62	-0.17	-0.08	-0.15	0.36	1.00												
11. Interlocking	0.22	0.16	0.09	-0.39	0.07	-0.10	0.11	0.01	0.12	0.23	1.00											
12. Market	0.01	-0.08	0.11	0.13	0.06	-0.09	-0.17	0.05	0.02	0.14	-0.03	1.00										
13. Meetings	0.38	0.18	0.02	-0.34	0.26	0.15	0.04	-0.14	0.21	0.31	0.19	0.01	1.00									
15. No. directors	0.56	0.02	0.23	-0.27	0.04	-0.17	-0.08	-0.22	0.32	0.12	0.17	-0.11	0.08	1.00								
16. Non-executive director's ownership	-0.29	-0.04	-0.28	0.10	-0.15	0.09	0.04	0.88	-0.16	-0.18	-0.08	-0.03	-0.10	-0.13	1.00							
17. Realreturns	-0.07	-0.07	-0.11	0.07	0.09	0.00	-0.12	-0.06	0.02	0.00	-0.04	-0.10	-0.07	-0.13	0.00	1.00						
18. ROA	0.20	0.11	0.27	0.01	0.24	-0.08	-0.04	-0.10	0.02	0.44	0.05	0.23	-0.05	-0.13	-0.13	0.08	1.00					
19. ROE	0.07	0.02	0.22	0.02	0.29	-0.09	-0.13	-0.03	0.01	0.48	-0.05	0.27	-0.05	-0.16	-0.09	0.11	0.63	1.00				
20. Revenue	0.95	0.16	0.70	-0.22	0.38	-0.10	-0.09	-0.29	0.49	0.43	0.21	0.00	0.29	0.58	-0.26	-0.05	0.18	0.04	1.00			
21. Top20	0.39	0.26	0.27	-0.18	0.32	-0.27	-0.20	-0.18	0.29	0.09	0.16	-0.06	-0.07	0.34	-0.15	0.06	0.13	0.18	0.39	1.00		
22. Turnover	0.16	-0.06	0.04	-0.11	-0.04	-0.08	0.05	-0.20	0.07	-0.04	0.01	0.02	-0.04	0.37	-0.15	-0.02	-0.08	-0.07	0.17	0.16	1.00	

Correlations for variables with two and three year lags not shown.

**Appendix B: Determinants of Australian Bank Directors' Pay 1992-2005, Fixed Effects Specific Models**

<b>Variables</b>	<b>All Directors (1)</b>	<b>All Directors (2)</b>	<b>CEO (3)</b>	<b>CEO (4)</b>	<b>CEO (5)</b>
ln(pay) <sub>t-1</sub>	0.30 (2.14)**	0.31(2.24)**	0.35 (4.05)***	0.43 (5.19)***	0.37 (4.37)***
ln(Size <sub>t-1</sub> )	0.35 (3.40)***	0.45 (4.97)***	0.50 (6.30)***	0.43 (4.49)***	0.33 (4.29)***
ROA <sub>t-1</sub>	-	-	0.44 (5.25)***	-	-
ROE <sub>t-1</sub>	-	-	-	0.022 (2.86)***	-
EPS <sub>t-1</sub>	-	-	-	-	0.46 (2.55)**
ROE <sub>t-2</sub>	-	0.01 (1.82)*	-	-	-
EPS <sub>t-2</sub>	0.36 (4.44)***	-	-	-	-
Market <sub>t-1</sub>	-	-	0.24 (1.82)*	0.23 (2.02)**	0.31 (2.55)**
Directors' Age	-0.16 (-1.33)	-0.25 (-2.18)**	0.03 (3.00)***	0.03 (3.24)***	0.04 (4.65)***
Directors' Age squared	0.002 (1.47)	0.002 (2.31)**	-	-0.003 (-0.46)	-
Top 20 Directors'	-	-	0.009 (2.03)**	0.009 (2.36)**	0.01 (2.54)**
Ownership <sub>t-1</sub>	0.04 (3.42)***	0.04 (3.09)***	0.17 (2.50)**	0.13 (1.76)*	0.09 (5.39)***
Directors' Ownership Squared	-	-	-0.01 (-1.27)	-	-
CEO Stock Ownership	-	-	-0.30 (-2.87)***	-0.36 (-2.92)***	-0.31 (-2.59)**
Board Composition	-	-	-	-	-
Board Size	0.06 (2.70)***	0.05 (2.18)**	-0.06 (-2.98)***	-0.06 (-2.63)***	-0.06 (-3.04)***
Committees	-	-	0.05 (1.71)*	-	-
Interlocking Meetings	-	-	-	-	-0.56 (-1.87)*
Turnover	-	-	-	-	-
CEO Age	-	-	0.02 (1.86)*	0.02 (1.76)*	0.01 (1.64)
N	141	140	131	129	131
Adjusted R-squared	0.84	0.83	0.90	0.89	0.90

Notes: \*, \*\*, \*\*\* statistically significant at the 10%, 5% and 1% levels, respectively. White Heteroscedasticity-Consistent Standard Errors used. Fixed Effects statistically significant but not reported. N = sample size. Columns 1 and 2 relate to total directors' remuneration. Columns 3 to 5 relate to CEO remuneration.