

The relationship between composition of inside directors' compensation and firm's future performance: The influence of uncertainty

內部董事薪酬組成與公司未來績效關連性：不確定性之影響

Yi-Hui Tai¹

Department of Accounting, Ming Chuan University

Chia-Ling Lee

Department of Accounting, National Chengchi University

Abstract: Inside directors are an important part of a top management team's (TMT's) composition and are members of a firm's board of directors. The research focuses on the dual roles of inside director and the effect of the proportion of compensation for inside directors' dual roles on firm performance when the firm faces a highly uncertain environment. This study tests the following empirical issues: (1) whether the proportion of inside directors' compensation for their director roles is lower under a more uncertain environment; (2) according to the cronyism perspective, when the degree of uncertainty the firm faces is high, whether the proportion of inside directors' compensation for their director roles has a negative influence on firm performance; and (3) whether the aforementioned issues are still supported when there is CEO duality. The empirical results show that the proportion of inside directors' compensation for their director roles is lower in a more uncertain environment. Moreover, when the degree of uncertainty the firm faces is high, the proportion of inside directors' compensation for their director roles does not negatively influence firm performance, but when there is CEO duality, this proportion does negatively influence firm performance.

Keywords: Inside director, composition of compensation, firm performance,

¹ Corresponding author: Yi-Hui Tai, Department of Accounting, Ming Chuan University. Email: yhtai@mail.mcu.edu.tw. The authors acknowledge the helpful comments of Chris Bauman, Joanna L. Ho, Richard Hwang, Melloney Simerly, and workshop participants at the National Chenchi University, and AAA Annual Meeting. The authors are indebted to the research support from the Ministry of Science and Technology of Taiwan.

uncertainty.

摘要：內部董事屬於高階經營團隊的一員，亦是董事會成員之一。本文關注於內部董事的雙重角色以及當公司面臨高度不確定環境時，內部董事這兩種角色的薪酬比重對於公司未來績效之影響。本研究測試下列實證議題：(1) 內部董事的董事身分薪酬在不確定性較高的環境下是否比重較低；(2) 根據勾結理論，當不確定性較高時，董事身分薪酬對於公司未來績效是否呈現負向影響；(3) 本研究進一步考量董事長兼任總經理時，前述議題是否仍成立。本文實證結果發現：內部董事的董事身分薪酬在不確定性較高的環境下，比重較低。此外，不確定性較高，董事身分薪酬對於公司未來績效並沒有呈現負向影響；然而，當公司存在董事長兼任總經理時，董事身分薪酬對於公司未來績效會呈現負向影響。

關鍵詞：內部董事、薪酬組成、公司績效、不確定性

1. Introduction

A board's two primary roles of advising and monitoring are critical for firm performance (Brickley and Zimmerman, 2010; Kim *et al.*, 2014). Before the introduction of outside directors, boards were generally composed of inside executives who were effectively neutralized by the controlling shareholder(s), in particular among firms in ethnic Chinese communities and in the developing economies of East Asia (Chizema and Kim, 2010). Inside directors play dual roles in companies, as part of the top management team (TMT) and members of a firm's board of directors. Thus, an inside director who receives one compensation works simultaneously as both a director and manager. The company compensates inside directors according to these two dual roles. A director performs the function of monitoring, while a manager carries out decision making.

This study thus examines inside directors' compensation by taking their specific roles (i.e., director or manager) into account. Based on the levels of complexity and dynamism in an organizational environment, an uncertain environment has been identified as one of the key contextual factors for decision

making (Chapman, 1997; Hartmann, 2000). Uncertainty increases managers' private information and adds difficulties to directors for monitoring managers. This study is first motivated to study how inside director compensation should be distributed by coordinating the aforementioned two roles under an uncertain environment. A question thus arises: Does an uncertain environment lower the proportion of inside directors' compensation for their director role?

After the Enron and Worldcom scandals, director compensation began receiving increased attention. Among SandP 1500 firms, the total compensation per director increased yearly from US\$35,000 in 1996 to US\$190,000 in 2014. This rise in director compensation is largely due to an increase in pay for performance, such as director equity-based pay as well as the value of stock and options granted to directors (Lahlou and Navatte, 2017). Outside directors' compensation comes primarily from the transportation subsidies they receive, which closely relate to the number of meetings held throughout the year. It is therefore reasonable to evaluate the results of board supervision based on the attendance of meetings (Vafeas, 1999; Cordeiro *et al.*, 2000). On the other hand, inside directors' compensation based on their managerial role is closely associated with firm performance. The agency theory has asserted that an uncertain environment increases errors with regard to performance evaluation (Prendergast, 2000). In a firm with a high degree of uncertainty the supervising managers face more difficulties in carrying out their work. In an uncertain environment, it is difficult to evaluate the effort of the inside director, and so the role of an inside director to enhance a firm's performance is less pronounced. Therefore, the second issue discussed herein is to discuss how to distribute inside directors' compensations according to their dual roles to improve firm performance under environmental uncertainty. We are interested in examining whether offering lower compensation for an inside director's role enhances firm performance when the focal company faces greater uncertainty.

The prior literature has examined the difficulties of evaluating the performance of a director's supervision (Lawler *et al.*, 2002; Schaffer, 2002). One common perspective consistent with the agency theory is that a board seat provides

managers with power and influence (Finkelstein, 1992); thus, there could be negative consequences from reduced board independence associated with chief executive officers (CEOs) serving as board chair. The literature shows that stronger CEOs have more power over the compensation setting process, and so they receive significantly higher levels of total cash and total compensation in most situations (van Essen *et al.*, 2015). In this setting the link between compensation and performance is lower in firms with more powerful CEOs than in ones with less powerful CEOs. As a result, increasing inside directors' compensations for their director role would contribute less to firm performance, because the person taking the positions as both chairman and director should have influence over the quality and quantity of private information. Therefore, the last issue this paper focuses on is thus the effects of decreasing the compensation that inside directors receive for their director role on firm performance when CEO duality exists.

The ownership and management rights of most corporations are never completely separate in communities with a Chinese cultural background. Inside directors not only play a monitoring role in corporate governance, but also serve as executives (Tai, 2017), yet few studies have examined the monitoring role of inside directors in this context (Drymiotes, 2007). Many directors concurrently serve as top managers in Taiwan-listed companies, while directors who also hold executive positions in the firm are also a common phenomenon. It is thus worthwhile using data on Taiwan-listed companies to examine how inside directors are compensated for their dual roles. This is our first contribution to the literature. The second contribution is to examine how inside directors' compensation can be designed so that the directors focus less on their director role when the firm faces a higher degree of uncertainty. A better design here would especially benefit firm performance when CEO duality exists. Pfeffer and Salancik (1978) indicate that directors base their organizational influence and power on their ability to handle environmental contingencies. Thus, the power of the board may decrease with a change in these contingencies (Hambrick, 1981), and this might be particularly true for inside directors. By reviewing the annual reports of

Taiwan-listed firms, this research constructs an unbalanced panel dataset by hand-collecting the data of inside directors' compensation. Our findings suggest that a firm's compensation committee should aim to decrease the proportion of inside directors' compensation for their director role and increase that for the manager role when both CEO duality exists and the level of uncertainty is high.

The rest of this research runs as follows. Section 2 presents a literature review and this study's hypotheses. Section 3 discusses the data and methodology used herein. Section 4 provides details of the sample selection, descriptive analyses, and empirical results. Section 5 offers a summary of this work and the conclusions.

2. Literature review and hypothesis development

The manager role of inside directors contributes primarily to the executive function, because it requires involvement in the company's operations; on the contrary, the director role of inside directors impacts primarily on the monitoring function (e.g., Kim *et al.*, 2014; DeBoskey *et al.*, 2019; Chang *et al.*, 2019). Inside directors have firm-specific information that is critical to alleviating problems arising from information asymmetry between the board and manager(s). Companies determine the optimal weight of compensation for inside directors' two roles based on their need for the executive and monitoring functions.

An inside director possesses inside information to be shared with other board members, which can enhance board monitoring (Fama and Jensen, 1983; Raheja, 2005; Laux, 2008; Adams and Ferreira, 2007; Tai, 2017). Drymiotis (2007) shows that boards with inside directors who supply information of the agent's productivity may have incentives to monitor the agents *ex post*, thus allowing the boards to indirectly commit to engage in active monitoring. Moreover, Mace (1986) reports that outside directors frequently use inside directors as a source of information. To summarize, compared to outsiders, inside directors can access private information via the efforts of managers at a lower cost as they have actually been involved in the company's affairs. This allows them to make more accurate decisions as the information cannot be easily disregarded by the managers. Hence, the monitoring function of inside directors is beneficial (Almazan and Suarez,

2003; Raheja, 2005; Laux, 2008; Adams and Ferreira, 2007; Drymiotes, 2007; Tai, 2017).

Miller *et al.* (2002) point out that operational risk can be categorized as a form of uncertainty. The higher the operational risk is, the more difficult is the effort involved in evaluating the firm. It is thus not easy to monitor managerial performance when there is a high level of risk (Kren and Kerr 1993). In short, this study predicts that the higher the degree of uncertainty is, the more difficult it is to measure an agent's involvement. As Prendergast (2000) mentions, when environmental noise and the number of uncontrollable factors increase, the effectiveness of monitoring decreases; in other words, in an uncertain environment, the inside directors' monitoring function has a limited contribution to the valuation of the agent's involvement. To sum up, the greater the risk is, the more difficult it is to measure the involvement of managers (Eriksson, 1999; Kato and Long, 2011). As a result, in cases of high uncertainty the marginal contribution of the monitoring function of inside directors decreases, and so the compensation related to the directors' role should also decrease. The related hypothesis is proposed as follows.

Hypothesis 1: The degree of uncertainty is negatively associated with the proportion of inside directors' compensation for their director roles.

The primary purpose of a compensation contract is to ensure that there is an alignment of interests between shareholders and corporate management (Indjejikian, 1999). As postulated in the agency theory, it is essential for shareholders to provide incentives to self-interested, risk-averse, and effort-shirking executives, and so they are more motivated to maximize shareholders' wealth (Murphy, 1985; Coughlan and Schmidt, 1985; Veliyath and Bishop, 1995; Belliveau *et al.*, 1996). However, the cronyism perspective (e.g., Brick, Palmon, and Wald, 2006) notes that the existence of excess compensation is the speculative behavior generated by the agent using the information asymmetry between the agent and the principal. In other words, according to the cronyism perspective there is no alignment between agents' efforts and agents' compensation. As a result, based on the cronyism perspective, the compensation related to inside directors' role exhibits a non-positive correlation with company performance.

The level of uncertainty a firm faces refers to the degree of unpredictable change in the environmental factors related to strategic decision making (Kren and Kerr, 1993). When uncertainty and monitoring costs both increase, it becomes an even more difficult task for inside directors to manipulate the relationship between the compensation related to inside directors' role and company performance. In other words, the degree of uncertainty a firm faces decreases the incentives of inside directors to exploit the relationship between the compensation related to their director role and company performance, because the degree of unpredictable change in the environmental factors is too complicated for them to anticipate. The second hypothesis is thus stated as follows.

Hypothesis 2: According to the cronyism perspective, the proportion of inside directors' compensation for their director role is more negatively associated with firm performance when the degree of a firm's uncertainty is higher.

Outsiders are more independent compared with a management team, but they have relatively less operating information (Fama and Jensen, 1983). Inside managers can directly observe firm operations and serve an important role to better understand a firm's operations (e.g., Tai, 2017). Additionally, the participation of insiders on a board of directors can help outside directors to accurately evaluate the performance of the managerial team (Mace, 1986; Hermalin and Weisbach, 1998). The private information perspective has been used to examine the agency problem with regard to insiders' private information. This perspective suggests that insiders who participate in a firm's business operations can obtain managers' private information at lower cost and with less chance of being deceived by managers. Because of the accuracy of the information thus obtained, insiders can make better decisions than outsiders (Almazan and Suarez, 2003; Raheja, 2005; Adams and Ferreira, 2007; Drymiotes, 2007). As all inside directors have their own private information, together they can balance the power among board directors and lower the likelihood of the firm's money being diverted into the pockets of inside directors. However, if an inside director functions as the board chair and general manager, then he/she will be more influential in terms of decision making (Lu *et al.*, 2017). Consequently, the balance of power with regard to

private information among the board directors will decrease (Tai *et al.*, 2015), and the monitoring function of inside directors will weaken. In short, if the board chair also serves as CEO, then it is difficult for outside shareholders and the board of directors to monitor the CEO's decisions. CEO domination of the board is thus likely to lead to ineffective oversight by the board of directors (Goh *et al.*, 2014). Therefore, this study predicts that the proportion of inside directors' compensation for their director roles does have a negative influence on performance for firms with higher uncertainty when CEO duality exists. The third hypothesis is thus stated as follows.

Hypothesis 3: According to the cronyism perspective, the proportion of inside directors' compensation for their director role is more negatively associated with firm performance when the degree of a firm's uncertainty is higher and CEO duality exists.

3. Research method

3.1 Sample

This study collects sample data during the period of 2002 to 2004, because in 2004 Taiwan's Financial Supervisory Commission stipulated that the compensation of board directors, supervisors, general managers, and vice presidents should be recorded collectively on annual reports. Thus, on 2005 annual reports some firms adopted the new policy by recording the total amount of compensation of board directors, managers, salary/bonus, transportation expenses, and so forth, without specifying individual compensation. The Financial Supervisory Commission rescinded this disclosure requirement after 2004 for the purpose of protecting the privacy of senior managers. After considering the feasibility of sample data,² this study uses data from listed companies between

² The compensation model adopted in this study includes the variable of ROA standard deviation, which is measured through standard deviation values three years prior to the sample period. For example, to obtain the data for 2004 compensation explained, the relevant rate of returns between 2001 and 2003 should be calculated beforehand. In short, all of the variable data have to be traced back to four years prior to the sample period. Moreover, the selected sample companies should operate for a consecutive sample period. Sample companies without complete data of

2002 and 2004. Furthermore, the sample companies disclose every board director's and manager's remuneration, salary/bonus, transportation expenses, and other rewards without taking the duties (i.e., inside directors, independent directors, or outside directors) into consideration. The researchers have to manually check whether these board directors have duality in the sample companies to obtain the composition of inside directors' compensation.

Table 1 lists the sample details. Initially, we collect 3,349 observations from the Taiwan Economic Journal (TEJ) database, from which we remove 639 observations that have no inside directors and delete 1,012 observations that have missing data for compensation of inside directors, or other variables. Because this study requires information about the compensation of inside directors' director role and manager role, we further exclude 188 observations. Thus, the final sample totals 1,510 observations, among which 392 observations are from 2002, 486 are from 2003, and 632 are from 2004.

3.2 Variables

3.2.1 Dependent variable

Consistent with prior studies, such as Ittner and Larcker (1998), this study uses return on assets (ROA) to proxy for a firm's future performance. ROA is defined as net income before tax, interest, and depreciation divided by total assets.

3.2.2 Independent variable

3.2.2.1 Inside directors' director compensation (ET)

Inside directors' director compensation (ET) is defined as compensation for the director role divided by the total compensation for the inside director. Listed companies usually provide (1) director compensation, (2) salary/bonus, (3) transportation reimbursement for directors, and (4) other forms of compensation

standard deviation will therefore be removed. A long sample period also reduces the number of sample companies. Owing to the feasibility of obtaining sample data, the sample period is set between 2002 and 2004.

Table 1
Sample collection processes (N=1,510)

	2002	2003	2004	Total
Initial firm-year cases (number of listed companies at the end of 2002, 2003, and 2004)	1,065	1,111	1,173	3,349
Step 1: Less companies without inside directors	(235)	(226)	(178)	(639)
Step 2: Less companies with missing data				
-Without compensation of inside directors	(92)	(85)	(71)	(248)
-Missing data apart from standard deviation of ROA	(58)	(53)	(47)	(158)
-Unable to calculate standard deviation of ROA	(215)	(208)	(183)	(606)
Step 3: Less companies that are unable to identify compensation for the director role or the manager role	(73)	(53)	(62)	(188)
Firm-year cases used in the study	392	486	632	1,510
Proportion of final observations (%)	37%	44%	53%	46%

on their annual financial report. Inside directors' compensation for their director role is the sum of (1) director compensation and (3) transportation reimbursement for a director. On the other hand, inside directors' compensation for the manager role is the sum of (2) salary/bonus and (4) other forms of compensation.

3.2.2.2 Standard deviation of ROA (ROASD)

Miller *et al.* (2002) argue that operation risk is a form of uncertainty. We therefore use operation risk to represent uncertainty. Many studies use ROASD as a proxy for operation risk, including Banker and Datar (1989), Smith and Watts (1992), Core *et al.* (1999), and Core (2000). This paper follows this point of view.³

³ Zhang (2006) capture firm uncertainty by the standard deviation of forecasts across analysts using each analyst's last forecast before the firm's most recent earnings announcement. However, after 2004, Taiwan-listed companies have not been required to disclose forecasts across analysts. Therefore, in this study we are unable to use this measurement.

3.2.3 Control variable

The dependent variable in Model 1 is inside directors' director compensation (ET); on the other hand, the dependent variable in Model 2 is ROA. Following prior literature, such as Larcker *et al.* (2007) and Boateng *et al.* (2017), corporate governance variables can both influence directors' compensation and firm performance. Larcker *et al.* (2007) review the literature regarding corporate governance and identify 39 relevant variables. In total, 7 variables of Larcker *et al.* (2007) are used as control variables in this study, because of missing data from TEJ or multicollinearity. These 7 control variables are: number of directors serving on the board (Board Size); CEO duality (DUAL)- CEO duality is set to 1 when the CEO also serves as the chairman of the board and is set to 0 otherwise; the percentage of outstanding shares held by the average executive director, but excludes the holdings of the top executive (Excl. Top); the number of shareholders with more than 5% of company stock (% Block Own); the ratio of book value of debt to the market value of equity (Debt to Market); the ratio of book value of preferred equity to the market value of equity (Preferred to Market); the percentage of total annual CEO compensation that is comprised of performance plans and annual bonus (% Accounting Mix).

Based on Fama and Jensen (1983), Agrawal (1990), Baysinger and Hoskisson (1990), Pearce and Zahra (1992), Daily and Johnson (1997), and Yeh *et al.* (2001), two control variables are added to this study. They are ratio of outside directors (Outsider) and sub-major shareholders (OB). Sub-major shareholders (OB) take on a dummy variable with a value of 1 when any of the top 10 shareholders are from different business groups and zero otherwise. Finally, consistent with prior studies, Listed and Industry are added to control for trading type and the expenditure of employee bonus shares.

3.3 Regression model

3.3.1 Hypothesis 1

We refer to the model proposed by Larcker *et al.* (2007) to consider the

impact of “corporate governance”. Following Larcker *et al.* (2007), the control variables included in our research are related to the variables of “corporate governance”. We further include uncertainty in our model. Our study uses panel datasets, which consist of a number of observations over time on a number of cross-sectional units. If serial correlation exists, then the estimated variances of the regression coefficients are biased, leading to unreliable hypothesis testing (Hanushek and Jackson, 1977). Hence, we run regression models in a time series data analysis.

Model 1 is used to test H1. H1 proposes that the degree of uncertainty is negatively associated with the proportion of inside directors' compensation for their director roles. This study regresses inside directors' director compensation (ET) on degree of uncertainty and measures degree of uncertainty by the standard deviation of ROA (ROASD). H1 is supported, if β_1 is significantly negative.

$$\begin{aligned}
 ET_{i,t} = & \alpha + \beta_1 ROASD_{i,t} + \beta_2 \text{Board Size}_{i,t} + \beta_3 DUAL_{i,t} + \beta_4 \text{Excl. Top}_{i,t} \\
 & + \beta_5 \% \text{Block Own}_{i,t} + \beta_6 \text{Debt to Market}_{i,t} + \beta_7 \text{Preferred to Market}_{i,t} \\
 & + \beta_8 \% \text{Accounting Mix}_{i,t} + \beta_9 OB_{i,t} + \beta_{10} \text{Outsider}_{i,t} + \beta_{11} ROA_{i,t} + \beta_{12} \text{Listed}_{i,t} \\
 & + \beta_{13} \text{Industry}_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

Where

- ET : Inside directors' director compensation defined as their compensation for their director role divided by their total compensation including serving as director and manager.
- ROASD : The standard deviation of ROA. ROASD is calculated for the standard deviation of monthly ROA (net income before tax, interest, and depreciation divided by total assets) for the most recent 36-month period for each sample firm-year.
- Board Size : Number of directors serving on the board.

DUAL	: Dummy variable equal to 1 if CEO duality exists and 0 otherwise.
Excl. Top	: Percentage of outstanding shares held by the average executive director, but excluding the holdings of the top executive.
% Block Own	: Number of shareholders with more than 5% of company stock.
Debt to Market	: Ratio of book value of debt to the market value of equity.
Preferred to Market	: Ratio of book value of preferred equity to the market value of equity.
% Accounting Mix	: Percentage of total annual CEO compensation that is comprised of performance plans and annual bonus.
OB	: Dummy variable equal to 1 if sub-major shareholders exist and 0 otherwise.
Outsider	: Ratio of outside directors.
ROA	: Net income before tax, interest, and depreciation divided by total assets.
Listed	: Dummy variable equal to 1 if the company is a listed firm and 0 otherwise.
Industry	: Dummy variable equal to 1 if the company is in the electronics industry and 0 otherwise.

3.3.2 Hypothesis 2 and Hypothesis 3

Model 2 is used to examine H2 and H3. We also run Model 2 in a time series data analysis. H2 suggests that according to the cronyism perspective, the proportion of inside directors' compensation for their director role is more negatively associated with firm performance when the degree of the firm's uncertainty is higher. ROA is regressed on an interaction item (ROASD*ET). If β_4 is significantly negative, then H2 is supported.

According to the cronyism perspective, H3 assumes that the proportion of inside directors' compensation for their director role is more negatively associated with firm performance when the degree of the firm's uncertainty is higher and CEO duality exists. We interact the standard deviation of ROA (ROASD) with inside directors' director compensation (ET) and CEO duality (DUAL). If β_5 is significantly negative, then H3 is supported. The definitions of variables are from model 1.

$$\begin{aligned}
 ROA_{i,t+1} = & \alpha + \beta_1 ROASD_{i,t} + \beta_2 ET_{i,t} + \beta_3 DUAL_{i,t} + \beta_4 ROASD_{i,t} * ET_{i,t} \\
 & + \beta_5 DUAL_{i,t} * ROASD_{i,t} * ET_{i,t} \\
 & + \beta_6 Board\ Size_{i,t} + \beta_7 Excl.\ Top_{i,t} + \beta_8 \% \text{ Block Own}_{i,t} + \beta_9 Debt\ to\ Market_{i,t} \\
 & + \beta_{10} Preferred\ to\ Market_{i,t} + \beta_{11} \% \text{ Accounting Mix}_{i,t} \\
 & + \beta_{12} OB_{i,t} + \beta_{13} Outsider_{i,t} + \beta_{14} ROA_{i,t} + \beta_{15} Listed_{i,t} + \beta_{16} Industry_{i,t} + \varepsilon_{i,t} \quad (2)
 \end{aligned}$$

4. Empirical results

4.1 Descriptive statistics and correlation analyses

Table 2 reports descriptive statistics of the variables. With regard to the independent variable, inside director's director compensation (ET), the mean value is approximately 34%, and the largest value 1 denotes a firm with inside directors receiving compensation only for their director role, while the smallest value 0 denotes inside directors receiving compensation only for their manager role. The mean values for the risk proxy variables, standard deviation of ROA (ROASD), is 4.25. In addition, the mean value for dependent variable, ROA_{t+1} , is 0.07. Finally,

the mean values for Listed and Industry are 0.80 and 0.24, respectively, and thus about 80% of the sample companies are listed firms, and 24% of the sample companies are electronics companies.

Tables 3 reports the Pearson correlation. The independent variable, ET, negatively correlates with Board Size, % Accounting Mix, and Year 2. On the other hand, ET positively correlates with DUAL and Debt to Market.

4.2 Regression analyses

Table 4 reports the empirical results. In Table 4 the coefficient of ROASD is -0.004 and significant at the 5% level ($t = -2.13$), thus supporting H1. In other words, inside directors' director compensation (ET) is negatively associated with standard deviation of ROA (ROASD). The coefficient of the interaction term (standard deviation of ROA (ROASD) and the proportion of inside directors' director compensation (ET)) is 0.344 ($t = 1.59$), which is statistically insignificant. H2 is not supported accordingly. In other words, the insignificant result implies an inconclusive argument of H2.

The coefficient of the interaction term (DUAL*ROASD*ET) is -0.403 and significant at the 5% level ($t = -2.11$), which suggests that H3 is supported.⁴ In other words, judging the input of the manager is hard when operation risk is high and CEO duality exists. Therefore, supervision of the director is inefficient in this case. An individual director may have a lesser impact on the decision making of the board of directors and affects the balance of private information if he/she is appointed as the general manager. The firm should decrease the proportion of inside directors' compensation for director role to increase its future performance.

4.3 Additional analyses

Table 5, Table 6, and Table 7 report the empirical results of additional

⁴ We also separate samples into two groups: one is DUAL=1 and the other is DUAL=0. The empirical results show that the coefficient of ROASD*ET in group of DUAL=1 is significantly negative ($t = -2.23$) and the coefficient of ROASD*ET in group of DUAL=0 is insignificant ($t = 0.51$). Therefore, the additional test results also provide empirical evidence to support H3.

Table 2
Descriptive statistics (N=1,510)

Variable	Mean	Median	Std. Dev.	Minimum	Maximum
ROASD	4.25	3.31	3.34	0.143	2.47
ET	0.34	0.15	0.38	0	1
ROA _{t+1}	0.07	0.07	0.28	-0.88	0.46
Board Size	7.19	7	3.17	3	27
DUAL	0.32	0	0.47	0	1
Excl. Top	0.02	0.004	0.03	0	0.39
% Block Own	2.14	2	1.57	0	9
Debt to Market	0.93	0.58	1.37	0	24.75
Preferred to Market	0.00	0	0.07	0	3.04
% Accounting Mix	0.57	0.74	0.41	0	1
OB	0.37	0	0.48	0	1
Outsider	0.18	0.16	0.17	0	0.75
ROA _t	0.08	0.08	8.06	-0.62	0.43
Listed	0.80	0	0.60	0	1
Industry	0.24	0	0.42	0	1

ET: Inside director's director compensation is defined as the compensation for the director role divided by the total compensation to the inside director; ROASD: The standard deviation of ROA. ROASD is calculated for the standard deviation of monthly ROA (net income before tax, interest, and depreciation divided by total assets) for the most recent 3-year period for each sample firm-year; ROA: Net income before tax, interest, and depreciation divided by total assets; Board Size: Number of directors serving on the board; DUAL: Dummy variable equal to 1 if CEO duality exists and 0 otherwise; Excl. Top: Fraction of outstanding shares held by the average executive director, but excludes the holdings of the top executive; % Block Own: Number of shareholders with more than 5% of stock; Debt to Market: Ratio of book value of debt to the market value of equity; Preferred to Market: Ratio of book value of preferred equity to the market value of equity; % Accounting Mix: Fraction of total annual CEO compensation that is comprised of performance plans and annual bonus; OB: Dummy variable equal to 1 if sub-major shareholders exist and 0 otherwise; Outsider: Ratio of outside directors; Listed: Dummy variable equal to 1 if the company is a listed firm and 0 otherwise; Industry: Dummy variable equal to 1 if the company is in the electronics industry and 0 otherwise.

analyses. The additional analyses of this study focus on four issues and we discuss them as follows. In the first item of the additional analyses, this study replaces the proxy for the firm's future performance ROA_{t+1} (ROA of the next year) with ROA_{t+2} (ROA of the 2nd coming year). Stock compensations are not revealed in

Table 3
Correlation matrix

	ROASD	ET	ROA _{t+1}	Board Size	DUAL	Excl. Top	% Block Own	Debt to Market	Preferred to Market	% Accounting Mix	OB	Outsider
ROASD	1.000											
ET	0.023	1.000										
ROA _{t+1}	-0.024	-0.024	1.000									
Board Size	-0.145 ^b	-0.069 ^b	0.074 ^b	1.000								
DUAL	0.052 ^a	0.085 ^b	0.013	-0.219 ^b	1.000							
Excl. Top	-0.028	0.002	0.081 ^b	-0.106 ^b	0.137 ^b	1.000						
% Block Own	-0.087 ^b	0.020	0.121 ^b	-0.124 ^b	-0.005	0.157 ^b	1.000					
Debt to Market	0.073 ^b	0.058 ^a	-0.224 ^b	-0.029	0.000	-0.068 ^b	-0.040	1.000				
Preferred to Market	0.044	-0.026	-0.015	-0.015	-0.019	-0.016	-0.001	0.215 ^b	1.000			
% Accounting Mix	-0.042	-0.798 ^b	-0.046	0.111 ^b	-0.165 ^b	0.011	0.014	-0.034	0.023	1.000		
OB	0.038	-0.014	0.111 ^b	0.156 ^b	-0.001	-0.092 ^b	-0.143 ^b	-0.104 ^b	-0.015	-0.024	1.000	
Outsider	-0.009	-0.021	0.013	-0.013	0.094 ^b	0.159 ^b	0.003	-0.102 ^b	-0.025	0.009	-0.093 ^b	1.000
ROA _t	-0.019	-0.028	0.643 ^b	0.045	0.000	0.087 ^b	0.073 ^b	-0.373 ^b	-0.088 ^b	-0.068 ^b	0.101 ^b	0.041

1. All variables are defined in Table 2.

2. ^a and ^b indicate significance at the 1% and 5% levels, respectively.

Table 4
Regression statistics for models (N=1,510)

	Model 1 (ET _t)	Model 2 (ROA _{t+1})
Intercept	0.802 (25.11)***	10.624 (7.02)***
ROASD	-0.004 (-2.13)**	-0.031 (-0.29)
ET	-	-5.110 (-3.90)***
ROASD*ET	-	0.344 (1.59)
DUAL*ROASD*ET	-	-0.403 (-2.11)**
Board Size	0.001 (0.70)	0.220 (2.91)***
DUAL	-0.032 (-2.94)***	0.919 (1.54)
Excl. Top	0.180 (1.28)	15.682 (2.58)***
% Block Own	0.005 (1.81)*	0.772 (5.13)***
Debt to Market	0.003 (0.70)	-1.320 (-7.61)***
Preferred to Market	-0.051 (-0.69)	4.512 (1.52)
% Accounting Mix	-0.761 (-54.42)***	-4.553 (-4.79)***
OB	-0.005 (-0.40)	1.666 (3.34)***
Outsider	0.003 (1.09)	0.162 (0.11)
ROA	-0.004 (-4.40)***	0.721 (29.59)***
Listed	0.000 (0.03)	2.571 (4.35)***
INDUSTRY	-0.005 (-4.80)***	-0.821 (-1.45)
AdjR ²	0.680	0.103
F Value	213.01	11.11

1. All variables are as defined in Table 2 and include t-statistics (in parentheses).

2. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

3. The VIF of all variables is less than 2.

this research period, and Industrial Bank of Taiwan has argued that the value of bonuses provided to employees in the non-electronics industry is only 2.24% of net profit after tax. Thus, we anticipate that the stock bonus of employees in the non-electronics industry is only a minor proportion, and the cash bonus represents nearly the total value of the bonus provided. We then include the non-electronics industry in the second additional analyses and examine if the results of the main “regression analyses” are applicable.

Many studies have noted that the accounting measures of profitability, such as return on assets (ROA), are calculated based on past information and thus can be manipulated by managers, in contrast to Tobin’s Q (Q), which considers the firm’s market share and intangible assets and is able to reflect the future value of the firm (Lindenberg and Ross, 1981; Wernerfelt and Montgomery, 1988; Lang and Stulz, 1994; Bharadwaj *et al.*, 1993; Yeh, 2005). Moreover, Murphy (1985) asserts that company performance should be assessed using market-based measures, because these can reflect shareholder wealth and, unlike accounting-based measures, are neither backward looking nor easily manipulated by executives. Therefore, based on the previous literature, this study uses Tobin’s Q (Q) in the third part of the additional analyses to measure company performance, defined as the market value of equity plus the book value of debt divided by the total assets.

According to related literature, such as Ahmed *et al.* (2002), Hutchinson (2003), Hsueh (2008), and Lee *et al.* (2011), the measure of uncertainty refers to the volatility in the firm’s return stream. Therefore, the last item of the additional analyses is to change the proxy of uncertainty from the standard deviation of ROA (ROASD) to the standard deviation of ROE (ROESD) and the standard deviation of return on stock (RETSD). The standard deviation of these new measures is calculated for the past 36 months starting from the end of the sample year, which is the same as the calculation method of the standard deviation of ROA (ROASD).

4.3.1 Using ROA_{t+2} as a proxy for a firm’s future performance

Table 5 summarizes the empirical results. The results of using ROA_{t+2} as a

proxy for a firm's future performance are the same as those for using ROA_{t+1} , because H2 is not supported, but H3 is supported. Therefore, there is a lag in the influence of the financial performance index on future financial performance.

4.3.2 Using non-electronics industries as the sample

In Table 6 the results of using non-electronics industries as the sample is consistent with that of using all observations. In other words, the empirical result of "regression analyses" is applicable.⁵

4.3.3 Using Tobin's Q_{t+1} as a proxy for a firm's future performance

In Table 7 the results of using Tobin's Q_{t+1} as a proxy for a firm's future performance is consistent with that of using ROA_{t+1} . In other words, the findings support H3, but not H2.

4.3.4 Using ROESD and RETSD as a proxy for uncertainty

After using ROESD and RETSD as a proxy for uncertainty, the coefficients of ROESD and RETSD are -0.003 and -0.002, respectively, and significant at the 5% level ($t = -2.10$ and -2.03), thus supporting H1. On the other hand, the coefficients of the interaction terms (ROESD*ET and RETSD*ET) are 0.167 and 0.162 ($t = 1.57$ and 1.55), respectively, which is statistically insignificant. Therefore, H2 is not supported.

The coefficients of the interaction terms (DUAL*ROESD*ET and DUAL*RETSD*ET) are -0.398 and -0.402 and significant at the 5% level ($t = -2.08$ and -2.10), respectively, which support H3. To summarize, the results of using ROESD and RETSD as a proxy for uncertainty are consistent with that of

⁵ We also use electronics industries as the sample and re-run Model 1 and Model 2. The empirical results show that the coefficient of ROASD on ET is -0.009 ($t = -2.61$) and the coefficient of ROASD*ET and DUAL*ROASD*ET on ROA_{t+1} are -0.074 ($t = -0.21$) and -0.262 ($t = -0.76$), respectively. In short, as we use electronics industries as the sample, the results support H1 and do not support H2 which are consistent with non-electronics industries. To summarize, operation uncertainty reduces inside directors' compensation for their director roles in electronics industries.

Table 5
Regression statistics for using ROA_{t+2} as a proxy for a firm's future performance (N=1,510)

	ROA _{t+2}
Intercept	10.602 (7.01)***
ROASD	-0.027 (-0.33)
ET	-5.104 (-3.28)***
ROASD*ET	0.340 (1.57)
DUAL*ROASD*ET	-0.406 (-2.16)**
Board Size	0.210 (2.77)***
DUAL	0.892 (1.40)
Excl. Top	15.675 (2.45)**
% Block Own	0.719 (5.01)***
Debt to Market	-1.303 (-7.45)***
Preferred to Market	4.518 (1.52)
% Accounting Mix	-4.548 (-4.42)***
OB	1.616 (3.22)***
Outsider	0.176 (0.19)
ROA	0.721 (29.41)***
Listed	2.578 (4.25)***
INDUSTRY	-0.817 (-1.38)
AdjR ²	0.101
F Value	11.03

1. All variables are as defined in Table 2 and include t-statistics (in parentheses).

2. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

3. The VIF of all variables is less than 2.

Table 6
Regression statistics with the non-electronics industry as the sample
(N=1,144)

	Model 1 (ET_t)	Model 2 (ROA_{t+1})
Intercept	0.533 (20.10)***	9.211 (6.40)***
ROASD	-0.002 (-2.45)**	-0.002 (-0.48)
ET	-	-4.190 (-3.66)***
ROASD*ET	-	0.201 (1.53)
DUAL *ROASD*ET	-	-0.381 (-2.14)**
Board Size	0.004 (0.58)	0.210 (2.89)***
DUAL	-0.013 (-2.08)**	0.212 (0.55)
Excl. Top	0.194 (1.56)	15.666 (2.45)***
% Block Own	0.007 (1.99)**	0.761 (4.51)***
Debt to Market	0.005 (0.91)	-1.310 (-7.19)***
Preferred to Market	-0.020 (-0.51)	4.500 (1.43)
% Accounting Mix	-0.745 (-54.12)***	-4.539 (-4.41)***
OB	-0.007 (-0.53)	1.611 (3.02)***
Outsider	0.002 (1.49)	0.168 (0.14)
ROA	-0.002 (-4.83)***	0.671 (29.11)***
Listed	0.000 (0.04)	2.502 (4.29)***
AdjR ²	0.590	0.102
F Value	152.43	13.81

1. All variables are as defined in Table 2 and include t-statistics (in parentheses).

2. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

3. The VIF of all variables is less than 2.

Table 7
Regression statistics for using Tobin's Q_{t+1} as a proxy for a firm's future performance (N=1,510)

	Tobin's Q_{t+1}
Intercept	8.002 (6.03)***
ROASD	-0.009 (-0.22)
ET	-4.428 (-3.18)***
ROASD*ET	0.214 (1.55)
DUAL*ROASD*ET	-0.312 (-2.09)**
Board Size	0.207 (2.69)***
DUAL	0.219 (0.52)
Excl. Top	13.420 (2.49)**
% Block Own	0.614 (4.16)***
Debt to Market	-1.308 (-7.11)***
Preferred to Market	4.400 (1.49)
% Accounting Mix	-4.502 (-4.01)***
OB	1.680 (2.98)***
Outsider	0.194 (0.14)
ROA	0.701 (28.45)***
Listed	2.677 (4.08)***
INDUSTRY	-0.804 (-1.23)
AdjR ²	0.127
F Value	13.30

1. All variables are as defined in Table 2 and include t-statistics (in parentheses).

2. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

3. The VIF of all variables is less than 2.

using ROASD as a proxy for uncertainty. In other words, the empirical result of “regression analyses” is robustness.

4.4 Endogeneity analyses

The estimation of Model 1 and Model 2 may suffer from endogeneity. First, it is likely that this study omits some unobservable variables that simultaneously affect firm performance and the relationship between inside directors' director compensation, the standard deviation of ROA, and CEO duality. Second, firm performance and the relationship between inside directors' director compensation, the standard deviation of ROA, and CEO duality may be jointly determined. To alleviate the concern about endogeneity, we employ two techniques: a fixed-effect model and a dynamic panel data analysis. The fixed-effect model can mitigate the endogeneity that arises from omitted unobservable variables (Conyon and He, 2011; Zhang *et al.*, 2014), while a dynamic panel data analysis can alleviate endogeneity that arises from simultaneous determination (Blundell and Bond, 1998; Roodman, 2009; Aslan and Kumar, 2012; Zhang *et al.*, 2014).

The fixed-effect model is used to analyze longitudinal data with repeated measures on both independent and dependent variables. It has the attractive feature of controlling for all stable characteristics of the observations, whether measured or not. Therefore, we employ a fixed-effect model to control both firm-fixed effect and year-fixed effect and re-run Model 1 and Model 2 to examine our hypotheses.

We also consider a dynamic panel data analysis, in the sense that it contains (at least) one lagged dependent variable. When employing a dynamic panel data analysis, in Model 1 we include `DEPENDENT_1`, which is a number of the dependent variable of the previous year to control the first-order serial correlation. Because in Model 2 we already included a control variable- $ROA_{i,t}$, we include `DEPENDENT_2`, which is a number of the dependent variable of the last two years to control the second-order serial correlation when employing a dynamic panel data analysis of Model 2.

Table 8 reports the regression results by employing the two techniques for Model 1 and Model 2. Across two regression results, the coefficients for ROASD

and $DUAL*ROASD*ET$ remain significantly negative, while the coefficient of $ROASD*ET$ remains insignificant, which is consistent with our previous findings. Therefore, endogeneity is not an issue in this study.

5. Conclusions

This research investigates the relationship between the composition of inside directors' compensation and a firm's future performance. The results consist of three parts. The first part covers the empirical analyses of three hypotheses in the regression analyses section, and the remaining two parts are "additional analyses" and "endogeneity analyses". In the section of regression analyses, ROA_{t+1} and ROA_{t+2} are both used as proxies for a firm's future performance. In the additional analysis, we first consider only observations of non-electronics industries. Next, we use market-based performance, Tobin's Q, to proxy for a firm's future performance. In the last additional analysis, this study uses ROESD and RETSD as a proxy for uncertainty. Finally, in the section of "endogeneity analyses", we employ two techniques, a fixed-effect model and dynamic panel data analysis, to mitigate the endogeneity that arises from omitted unobservable variables and alleviate endogeneity that arises from simultaneous determination. The results of all tests are consistent, which support H1 and H3, and rejects H2. That means the proportion of inside directors' compensation for their director role is low in a highly uncertain environment. Thus, a firm should decrease the proportion of inside directors' compensation for their director's role to encourage them put forth more executive efforts to increase their firm's future performance when the degree of the firm's uncertainty is high and CEO duality exists.

This study offers three contributions to the literature. First, it shows that inside directors play important roles to enhance firm performance in an uncertain environment. In communities with Chinese cultural backgrounds (for instance, Taiwan), the ownership and management rights of many corporations are never completely separate; in other words, directors not only play a monitoring role in corporate governance, but also serve as executives. However, few studies have examined the monitoring role of inside directors in this context (e.g., Drymiotis,

Table 8
Regression statistics for endogeneity analyses (N=1,510)

	Fixed-effect Model		Dynamic Panel Data Analysis	
	Model 1 (ET _t)	Model 2 (ROA _{t+1})	Model 1 (ET _t)	Model 2 (ROA _{t+1})
Intercept	0.709 (25.01)***	9.641 (6.58)***	0.654 (23.98)***	9.604 (7.12)***
ROASD	-0.002 (-2.13)**	-0.022 (-0.27)	-0.002 (-2.11)**	-0.028 (-0.20)
ET	-	-5.107 (-3.44)***	-	-5.003 (-3.73)***
ROASD*ET	-	0.317 (1.54)	-	0.341 (1.55)
DUAL*ROASD*ET	-	-0.401 (-2.03)**	-	-0.396 (-2.05)**
Board Size	0.001 (0.62)	0.213 (2.81)***	0.001 (0.55)	0.214 (2.86)***
DUAL	-0.039 (-2.84)***	0.920 (1.53)	-0.034 (-2.82)***	0.915 (1.51)
Excl. Top	0.175 (1.30)	15.610 (2.24)**	0.181 (1.24)	15.671 (2.63)***
% Block Own	0.007 (1.76)*	0.701 (5.08)***	0.006 (1.89)*	0.754 (5.08)***
Debt to Market	0.003 (0.78)	-1.314 (-7.01)***	0.003 (0.66)	-1.311 (-7.50)***
Preferred to Market	-0.042 (-0.61)	4.501 (1.43)	-0.059 (-0.72)	4.591 (1.42)
% Accounting Mix	-0.730 (-54.18)***	-4.546 (-4.81)***	-0.749 (-53.51)***	-4.501 (-4.09)***
OB	-0.004 (-0.35)	1.616 (3.11)***	-0.005 (-0.30)	1.677 (3.15)***
Outsider	0.003 (1.24)	0.160 (0.09)	0.004 (1.26)	0.172 (0.16)
ROA	-0.003 (-4.29)***	0.701 (29.12)***	-0.003 (-4.65)***	0.702 (29.11)***
Listed	0.000 (0.06)	2.575 (4.11)***	0.000 (0.05)	2.560 (4.19)***
INDUSTRY	-0.001 (-4.55)***	-0.819 (-1.44)	-0.007 (-4.49)***	-0.812 (-1.47)
DEPENDENT_1	-	-	0.162 (6.13)***	-
DEPENDENT_2	-	-	-	0.714 (24.51)***
Firm fixed effect	Yes	Yes		
Year fixed effect	Yes	Yes		
AdjR ²	0.640	0.124	0.661	0.113
F Value	213.70	12.72	228.12	15.12

1. All variables are as defined in Table 2 and include t-statistics (in parentheses).

2. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively (two-tailed tests).

3. The VIF of all variables is less than 2. 4. DEPENDENT_1 is a number of the dependent variable of the previous year. DEPENDENT_2 is a number of the dependent variable of the last two years.

2007; Tai, 2017). Therefore, this study's investigation of the relationship between inside directors' director compensation and their firm's future performance can complement the existing corporate governance literature.

Second, the most relevant paper using Taiwan data with regard to the "inside director" issue is Tai *et al.* (2015). Tai *et al.* (2015) investigate the relationship between inside directors' excessive pay and the firm's future performance. Tai *et al.* (2015) define excess pay as pay for unobservable performance, and unobservable performance but the "excess pay" mentioning in Tai *et al.* (2015) does not equal to the "uncertainty" mentioning in our paper. In addition, excessive pay for the director's role is significantly and positively associated with Tobin's Q from the following year, which supports the existence of implicit contracts; however, our research focuses on the cronyism perspective. To summarize, Tai *et al.* (2015) adopt the "implicit contract" perspective and investigates the association between "excess" compensation of inside directors and the firm's future performance, while our study adopts the "cronyism" perspective and examines the association between the composition of inside directors' "actual" (not excess) compensation and the firm's future performance. As a result, our research provides additional findings compared with Tai *et al.* (2015).

Third, our research further considers the impacts of "uncertainty" on firm performance. Therefore, our study provides extra findings to fill the gap in the existing compensation contract literature related with "uncertainty".

The last contribution of this study is to present managerial implications from the empirical results. Kuo and Wang (2017) note that family firms accounted for 67.1% of the listed companies in Taiwan from 1996 to 2010. As Jensen (1993) and Klein (2002) point out, when firm management closely relates to the controlling family, managerial behavior is less likely to be effectively supervised by the board of directors. In other words, if a company is a family firm, then corporate governance mechanisms tend to be poor, because the controlling shareholders have control of the company, and outside (or independent) directors can only perform a limited supervisory function (Sue *et al.*, 2009; Tang, 2010; Chen and Hsieh, 2011). Therefore, it is important to find out how to appropriately induce

inside directors to play a supervisory role in corporate governance mechanisms in Taiwan. The managerial implication of this study is to provide some suggestions about how inside directors' compensation can be designed in order to enhance their incentives to play a supervisory role. Based on our empirical results, we suggest that a firm's compensation committee should aim to decrease the proportion of inside directors' compensation for their director role and increase that for their manager role when CEO duality exists and the level of uncertainty is high.

This paper makes three recommendations for future research. First, researchers can investigate the intermediary effect of other factors between the composition of inside directors' compensation and the firm's future performance. For instance, referring to Chang *et al.* (2017), a gender related issue has emerged as a prominent topic of discussion in corporate governance; therefore, future research can discuss the moderating effect of gender on the relation between the composition of inside directors' compensation and the firm's future performance. Second, stock compensation is not revealed in this study, and hence future researchers may duplicate this research after including stock compensation. Third, this article aims to explore how inside directors' compensation should be distributed through the director and manager roles in order to improve firm performance. Future researchers can follow up this study and come up with a good instrument to quantify the "monitoring" and "executive" intensity of the inside directors.

This study also comes with two limitations. First, the compensation of inside directors is obtained from annual reports, and differences may exist between the actual compensation provided and the compensation reported. Second, as stock compensations are not revealed during this research period, the compensation of inside directors in this research focuses only on the compensations reported in annual reports, which do not include stock compensations.⁶

⁶ The second additional analysis of this paper uses only non-electronics industries that have a small share of stock compensation to examine whether using only cash compensation as the proxy for actual compensation received is applicable.

Reference

- Adams, R. B., and Ferreira, D. (2007). A theory of friendly boards. *Journal of Finance*, 62(1), 217-250.
- Agrawal, A., and Mandelker, G. N. (1990). Large shareholders and the monitoring of managers: The case of antitakeover charter amendments. *Journal of Financial and Quantitative Analysis*, 25(2), 143-161.
- Ahmed, A. S., Billings, B. K., Morton, R. M., and Stanford, H. M. (2002). The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs. *Accounting Review*, 77(4), 867-890.
- Almazan, A., and Suarez, J. (2003). Entrenchment and severance pay in optimal governance structures. *Journal of Finance*, 58(2), 519-547.
- Aslan, H., and Kumar, P. (2012). Strategic ownership structure and the cost of debt. *Review of Financial Studies*, 25(7), 2257-2299.
- Banker, R. D., and Datar, S. M. (1989). Sensitivity, precision, and linear aggregation of signals for performance evaluation. *Journal of Accounting Research*, 27(1), 21-39.
- Baysinger, B., and Hoskisson, R. E. (1990). The composition of boards of directors and strategic control: Effects on corporate strategy. *Academy of Management Review*, 15(1), 72-87.
- Belliveau, M. A., O'Reilly Iii, C. A., and Wade, J. B. (1996). Social capital at the top: Effects of social similarity and status on CEO compensation. *Academy of Management Journal*, 39(6), 1568-1593.
- Bharadwaj, S. G., Varadarajan, P. R., and Fahy, J. (1993). Sustainable competitive advantage in service industries: A conceptual model and research propositions. *Journal of Marketing*, 57(4), 83-99.
- Blundell, R., and Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143.
- Boateng, A., Bi, X., and Brahma, S. (2017). The impact of firm ownership, board monitoring on operating performance of Chinese mergers and acquisitions. *Review of Quantitative Finance and Accounting*, 49(4), 925-948.
- Brick, I. E., Palmon, O., and Wald, J. K. (2006). CEO Compensation, director compensation, and firm performance: Evidence of cronyism? *Journal of Corporate Finance*, 12(3), 403-423.

- Brickley, J. A., and Zimmerman, J. L. (2010). Corporate governance myths: Comments on Armstrong, Guay, and Weber. *Journal of Accounting and Economics*, 50(2-3), 235-245.
- Chang, L. L., Guan, Y. D., and Hsiao, D. F. (2017). An exploratory study of female directors' constraint on real earnings management. *Corporate Management Review*, 37(2), 31-85.
- Chang, H. Y., Lee, C. Y., and Wong, Y. J. (2019). CEO career experience and firm innovativeness: Considering the moderating effect of independent directors. *Corporate Management Review*, 39(1), 83-117.
- Chapman, C. S. (1997). Reflections on a contingent view of accounting. *Accounting, Organizations and Society*, 22(2), 189-205.
- Chen, Y. J., and Hsieh, T. J. (2011). Inside ownership of business group and affiliated firm earnings management: The effects of international diversification and family tie. *Journal of Management*, 25(1), 65-80.
- Chizema, A., and Kim, J. (2010). Outside directors on Korean boards: Governance and institutions. *Journal of Management Studies*, 47(1), 109-129.
- Conyon, M. J., and He, L. (2011). Executive compensation and corporate governance in China. *Journal of Corporate Finance*, 17(4), 1158-1175.
- Cordeiro, J., Veliyath, R., Erasmus, E. J., and Tax, M. (2000). An empirical investigation of the determinants of outside director compensation. *Corporate Governance: An International Review*, 8(3), 268-279.
- Core, J. E. (2000). The directors' and officers' insurance premium: An outside assessment of the quality of corporate governance. *Journal of Law, Economics, and Organization*, 16(2), 449-477.
- Core, J. E., Holthausen, R. W., and Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics*, 51(3), 371-406.
- Coughlan, A. T., and Schmidt, R. M. (1985). Executive compensation, management turnover, and firm performance: An empirical investigation. *Journal of Accounting and Economics*, 7(1-3), 43-66.
- Daily, C. M., and Johnson, J. L. (1997). Sources of CEO power and firm financial performance: A longitudinal assessment. *Journal of Management*, 23(2), 97-117.
- DeBoskey, D. G., Luo, Y., and Zhou, L. (2019). CEO power, board oversight, and earnings announcement tone. *Review of Quantitative Finance and Accounting*,

52(2), 657-680.

- Drymotes, G. (2007). The monitoring role of insiders. *Journal of Accounting and Economics*, 44(3), 359-377.
- Eriksson, T. (1999). Executive compensation and tournament theory: Empirical tests on danish data. *Journal of Labor Economics*, 17(2), 262-280.
- Fama, E. F., and Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, 26(2), 301-325.
- Finkelstein, S. (1992). Power in top management teams: Dimensions, measurement, and validation. *Academy of Management Journal*, 35(3), 505-538.
- Goh, C. F., Rasli, A., and Khan, S. U. R. (2014). CEO duality, board independence, corporate governance and firm performance in family firms: Evidence from the manufacturing industry in Malaysia. *Asian Business and Management*, 13(4), 333-357.
- Hambrick, D. C. (1981). Environment, strategy, and power within top management teams. *Administrative Science Quarterly*, 26(2), 253-276.
- Hanushek, E. A., and Jackson, J. E. (1977). Models with discrete dependent variables. In *Statistical methods for social scientist* (pp. 179-216). New York, NY: Academic Press.
- Hartmann, F. G. H. (2000). The appropriateness of RAPM: Toward the further development of theory. *Accounting, Organizations and Society*, 25(4-5), 451-482.
- Hermalin, B. E., and Weisbach, M. S. (1998). Endogenously chosen boards of directors and their monitoring of the CEO. *American Economic Review*, 88(1), 96-118.
- Hsueh, C. H. (2008). Research on the interrelationship among stock ownership by directors and supervisors, earnings smoothing, and enterprise risk. *The International Journal of Accounting Studies*, 46, 107-130.
- Hutchinson, M. (2003). An analysis of the association between firm risk, executive share options and accounting performance: Some Australian evidence. *Review of Accounting and Finance*, 2(3), 48-71.
- Indjejikian, R. J. (1999). Performance evaluation and compensation research: An agency perspective. *Accounting Horizons*, 13(2), 147-157.
- Ittner, C. D., and Larcker, D. F. (1998). Innovations in performance measurement: trends and research implications. *Journal of Management Accounting*

Research, 10, 205-238.

- Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance, 48*(3), 831-880.
- Kato, T., and Long, C. (2011). Tournaments and managerial incentives in China's listed firms: New evidence. *China Economic Review, 22*(1), 1-10.
- Kim, K., Mauldin, E., and Patro, S. (2014). Outside directors and board advising and monitoring performance. *Journal of Accounting and Economics, 57*(2-3), 110-131.
- Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics, 33*(3), 375-400.
- Kren, L., and Kerr, J. L. (1993). The effect of behaviour monitoring and uncertainty on the use of performance-contingent compensation. *Accounting and Business Research, 23*(90), 159-167.
- Kuo, T. L., and Wang, C. Y. (2017). How does corporate governance affect the performance of family business? A long-term longitudinal analysis. *Journal of Accounting Review, 64*, 61-111.
- Lahlou, I., and Navatte, P. (2017). Director compensation incentives and acquisition performance. *International Review of Financial Analysis, 53*, 1-11.
- Lang, L. H. P., and Stulz, R. M. (1994). Tobin's q, corporate diversification, and firm performance. *Journal of Political Economy, 102*(6), 1248-1280.
- Larcker, D. F., Richardson, S. A., and Tuna, I. (2007). Corporate governance, accounting outcomes, and organizational performance. *Accounting Review, 82*(4), 963-1008.
- Laux, V. (2008). Board independence and CEO turnover. *Journal of Accounting Research, 46*(1), 137-171.
- Lawler Iii, E. E., Benson, G. S., Finegold, D. L., and Conger, J. A. (2002). Corporate boards: Keys to effectiveness. *Organizational Dynamics, 30*(4), 310-324.
- Lee, C. L., Shih, Y. N., and Tsai, Y. L. (2011). The impact of the alignment between performance measures, uncertainty and CEO compensation on firm performance. *Organization and Management, 4*(2), 39-77.
- Lindenberg, E. B., and Ross, S. A. (1981). Tobin's q ratio and industrial organization. *Journal of Business, 54*(1), 1-32.

- Lu, C. S., Chen, A., and Kao, L. (2017). How product market competition and complexity influence the on-job-learning effect and entrenchment effect of board tenure. *International Review of Economics and Finance*, 50, 175-195.
- Mace, M. L. (1986). *Directors: myth and reality (Rev. ed.)*. Boston, MA: Harvard Business School Press.
- Miller, J. S., Wiseman, R. M., and Gomez-Mejia, L. R. (2002). The fit between ceo compensation design and firm risk. *Academy of Management Journal*, 45(4), 745-756.
- Murphy, K. J. (1985). Corporate performance and managerial remuneration: An empirical analysis. *Journal of Accounting and Economics*, 7(1-3), 11-42.
- Pearce II, J. A., and Zahra, S. A. (1992). Board composition from a strategic contingency perspective. *Journal of Management Studies*, 29(4), 411-438.
- Pfeffer, J., and Salancik, G. R. (1978). *The external control of organizations : A resource dependence perspective*. New York, NY: Harper and Row.
- Prendergast, C. (2000). What trade-off of risk and incentives? *American Economic Review*, 90(2), 421-425.
- Raheja, C. G. (2005). Determinants of board size and composition: A theory of corporate boards. *Journal of Financial and Quantitative Analysis*, 40(2), 283-306.
- Roodman, D. (2009). How to do xtabond2: An introduction to difference and system gmm in stata. *The Stata Journal*, 9(1), 86-136.
- Schaffer, B. S. (2002). Board assessments of managerial performance: An analysis of attribution processes. *Journal of Managerial Psychology*, 17(2), 95-115.
- Smith, C. W., Jr., and Watts, R. L. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics*, 32(3), 263-292.
- Sue, S. H., Lu, C. J., and Chin, C. L. (2009). The association between family firms and earnings quality: Ownership, management and control. *NTU Management Review*, 19(S2), 35-69.
- Tai, Y. H., Tseng, C. Y., and Ko, C. E. (2015). Inside director's excess compensation and firm's future performance: An empirical analysis of implicit contract perspective. *NTU Management Review*, 25(2), 149-180.
- Tai, Y. H. (2017). Earnings management in family firms: The role of inside directors. *Corporate Management Review*, 37(1), 77-114.

- Tang, L. F. (2010). Family-controlled firms characteristics and earnings quality. *Journal of Contemporary Accounting*, 11(S), 371-410.
- Vafeas, N. (1999). Board meeting frequency and firm performance. *Journal of Financial Economics*, 53(1), 113-142.
- Van Essen, M., Otten, J., and Carberry, E. J. (2015). Assessing managerial power theory: A meta-analytic approach to understanding the determinants of CEO compensation. *Journal of Management*, 41(1), 164-202.
- Veliyath, R., and Bishop, J. W. (1995). Relationship between CEO compensation and firm performance empirical evidence of labour market norms. *International Journal of Organizational Analysis*, 3(3), 268-283.
- Wernerfelt, B., and Montgomery, C. A. (1988). Tobin's q and the importance of focus in firm performance. *American Economic Review*, 78(1), 246-250.
- Yeh, Y. H. (2005). Do controlling shareholders enhance corporate value?. *Corporate Governance: An International Review*, 13(2), 313-325.
- Yeh, Y. H., Lee, T. S., and Woidtke, T. (2001). Family control and corporate governance: Evidence from Taiwan. *International Review of Finance*, 2(1-2), 21-48.
- Zhang, M., Gao, S., Guan, X., and Jiang, F. (2014). Controlling shareholder-manager collusion and tunneling: Evidence from China. *Corporate Governance: An International Review*, 22(6), 440-459.
- Zhang, X. F. (2006). Information uncertainty and analyst forecast behavior. *Contemporary Accounting Research*, 23(2), 565-590.