Directors' Share Collateralization, Earnings Management and Firm Performance

Lanfeng Kao[†]
National University of Kaohsiung
Anlin Chen
National Sun Yat-Sen University

ABSTRACT: This study examines the association between director's share collateralization and earnings manipulation. We find that directors' share collateralization is significantly positively related to earnings management and the positive relation is stronger when the directors own more shares. Earnings management attributable to directors' share collateralization causes severe agency problems and hurts firm performance.

Keywords: Share collateralization, Directors' personal leverage, Board of directors, Earnings management, Abnormal accruals

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[†]   Corresponding author.

I. INTRODUCTION

In this study, we examine the relation between earnings management and share collateralization by board directors, and further investigate whether earnings management attributable to share collateralization hurts firm performance.   Share collateralization by directors reflects the financial pressure of directors.   Because shares of listed firms are widely accepted by financial institutions as collateral and because directors still keep the voting rights and control rights of the collateralized shares, many directors under financial pressure prefer to collateralize their shares at financial institutions to borrow money. The price levels and price volatility of pledged shares influence the amount that directors can borrow with the collateralized shares. Directors can borrow more using stocks with less price volatility. Consequently, to obtain more loans using collateralized shares, directors have incentive to smooth earnings to reduce stock price volatility.   The potential incentive to smooth income links with directors' personal financial decisions and the credibility of firm's earnings reporting.   Contrary to prior studies focusing on the monitoring role of board of directors and examining the effectiveness of the board characteristics (such as board size, independent directors and remuneration committee) as internal corporate governance mechanisms, our study investigates the potential agency problems arising from directors' share collateralization on financial reporting

The effects of board-of-director characteristics on financial reporting process have been a popular topic of research on corporate governance (see McMullen, 1996; Dechow et al., 1996; Beasley, 1996; Carcello and Neal, 2000; Klein, 2002; Xie, 2003; Anderson et al., 2004).   For example, Xie et al. (2003) indicate that a board, which is composed of more independent outside directors and directors with corporate experience, is less likely to manipulate earnings.   Moreover, the frequency of board meeting is inversely related to earnings management.   Most of the literature focuses on the governance function of board of directors.   However, the potential agency problems caused by inside directors on earnings reporting are also worth examining.   In Asia, families control most listed companies.   Typically, the controlling family members also serve as board members. Board members could influence the CEO's decisions, including financial reporting, to maximize the wealth of directors (or controlling families), and thus could expropriate the benefit of outside minority shareholders when interest conflicts arise between directors (or families) and outsider shareholders.

The agency problems of share collateralization by directors have been regarded as important governance issues in Taiwan since the Asian financial crisis of 1997.   The main reason for this is that many of the financially distressed firms featured a high percentage of share collateralization by directors. But, this was true not only of the distressed companies; according to TSE statistics, it is a common practice for directors on company boards in Taiwan to collateralize their shares for personal funding.   Up to November 2000, soon after the Asian financial crisis in 1997 and Taiwan's local financial turmoil in 1998, only 28% (147 firms) of the listed firms did not have shares collateralized by their directors. Among the remaining 72%, 312 firms (34% of the listed firms) had a collateralization ratio (defined as the number of shares collateralized by the board of directors divided by the total number of shares owned by the board of directors)

of less than 20%.   110 firms (21%) had a collateralization ratio of between 20% and 50%; 103 firms (20%) had collateralization ratios of over 50%; 16 firms (3.05%) had collateralization ratios between 70% and 80%; 17 firms (3.24%) had collateralization share ratios between 80% and 90%; and 21 firms (4%) had collateralized share ratios higher than 90%.   Moreover, 40% of the stocks traded in the over-the-counter market have similar ratios of share collateralization by their board of directors.   Since directors' share collateralization is so common and widespread in Taiwan, its effects on firm values should not be neglected.

The main contribution of this study is to extend the research on the effects of board-of-director characteristics on earnings quality.   To date, the literature has focused on the governance function of board of directors in financial reporting quality.   Research has been concentrated on the linkage between the independence of board and factors and activities related to earnings manipulation behaviors (Dechow et al., 1996; Beasley, 1996; Klein, 2002).   However, most boards of directors of listed firms in Taiwan lack of independence, so the governance function of board of directors is weak.   And, it is well known that board members become one of the sources of agency conflicts.   Thus, considering the interest conflicts between board of directors with low dependence and outside shareholders is worthwhile.   In this study, we try to find out whether directors' personal leverage in using firm's shares as collateral stirs opportunistic earnings manipulation and decreases the credibility of earnings reports in Taiwan.   The empirical results support our arguments that directors' personal leverage does increase the likelihood of earnings manipulation and that the opportunistic earnings management attributable to share collateralization of directors eventually gives rise to agency conflicts and hurts firm performance.

II. THE MECHANISMS OF SHARE COLLATERALIZATION

Stock investors in Taiwan can take their shares to financial institutions as collateral to raise a debt.   Due to the liquidity of the listed stocks, financial institutions in Taiwan prefer the debt-raisers to use listed shares as collateral.   Debt raisers who collateralize their shares at financial institutions still keep the voting rights and the cash flow rights of their shares unless they default.   When shareholders collateralize their shares at financial institutions, they can borrow up to 60% of the base value of collateralized shares and hold the debt for up to one year.   The base value of the collateralized shares is measured according to the preceding closing price or the average closing price three months prior to the collateralization date whichever is lower.   The stock price fluctuates leading to the appreciation or depreciation of the collateralized shares.   On the one hand, when the market value of collateralized shares increases, the collateralizing shareholders can continue to hold the debt.   On the other hand, when the market value of the collateralized shares decreases and falls below the required margin, the financial institutions will ask the collateralizing shareholders to collateralize more shares.   If the debt-raisers cannot provide more shares as collateral, the position of collateralized shares will be forced closed.

There is no particular regulation on the share collateralization of minority shareholders.   However, the Taiwan government asks the firms whose directors collateralize shares at financial institutions to disclose details of the share collateralization

on the website of Taiwan Stock Exchange every day. When a firm with directors' share collateralization would like to issue equity offerings, the details of share collateralization must be disclosed in the prospectus.

As mentioned in the introduction, directors' share collateralization is very popular in Taiwan. What is the purpose of collateralizing shares to raise a debt? The Commercial Times (October 7, 2000) reports that minority shareholders collateralize their shares to increase the leverage on their stock investments. The Commercial Times also indicates that directors collateralize their shares and use the funds raised from share collateralization to buy more shares of the firm to gain control over the firm. For example, a director holds 100 shares of the firm, which is 10% of the ownership of the firm. Theis director can raise debt through collateralizing all his shares and buy 60 more shares of the firm from the open market. In this case, the director's holding increases from 10% to 16% and he gains more control over the firm. Anecdotal evidence shows that the capital from collateralized shares is rarely contributed to the firms' projects.

III. RELATED LITERATURE

Board-of-director Characteristics, Corporate Governance and Financial Reporting Quality

The effects of board-of-director characteristics (such as size, composition and independence of the board) on quality of financial reporting process, earnings manipulation and financial statement fraud have been a popular topic of corporate governance in accounting research (McMullen, 1996; Dechow et al., 1996; Beasley, 1996; Carcello and Neal, 2000; Klein, 2002; Anderson et al., 2004). Generally, these studies suggest that independence of the board or auditing committee is related to earnings manipulation behavior. For example, Beasley (1996) and Dechow et al. (1996) find that the proportion of independent directors on the board (used to proxy for board independence) is inversely related to the likelihood of financial statement fraud. Klein (2002) also finds a negative association between abnormal accruals and board independence.

To date, researchers focus mainly on the oversight functions of board of directors and examine the effectiveness of the board membership and characteristics as internal corporate governance mechanisms. However, the board of directors in Asia is often controlled by families and is inefficient in serving outside minority shareholders by monitoring management and controlling shareholders. Even in a non family-controlled firm, the board itself is the source of conflicts of interest. Previous studies find that the deviation of ownership and control right of controlling families (or directors) in Asia decreases firm value (Claessens et al., 2000) and hurts the quality of reported earnings (Fan and Wong, 2002). Fan and Wong (2002) find that the increase of control right and deviation between control rights and cash flow rights cause agency conflicts to become more severe and accounting information provided by management to not reflect the firm's actual transactions. Out of self-interest, controlling shareholders tend to manipulate earnings to cover the effect of expropriation of wealth on earnings, or to report earnings in total instead of in details. Those behaviors hurt the creditability of accounting information. If investors do not trust the accounting reporting, the relation between

earnings information and stock return will decrease.

Directors' share collateralization decreases the informativeness of accounting earnings reports.   Kao and Chiou (2002) find that the higher the extent of share collateralization by directors, the lower the relation between corporate earnings information and stock returns.   They conjecture that due to the potential risk of providing more shares for margin requirements, managements who collateralize their shares have stronger incentives to manage earnings to avoid the drop of share prices. The strong incentive of earnings management makes reported earnings less creditable and thus decreases the relation between reported earnings and stock return.   However, Kao and Chiou (2002) do not test whether the management does manage earnings.   This study will try to make clear the relation between share collateralization and earnings management.

Share Collateralization by Board of Directors and Firm Performance

Due to lack of disclosure of personal leverage of board members, few researches ever examine the agency problem of share collateralization by board of directors and the relationship among directors; share collateralization and firm performance.   The listed firms in Taiwan are required to disclose periodically the information of share collateralization of the board members, manager and major shareholders.   This disclosure requirement provides data for researchers to study the effect of the directors' personal loans on firm performance.   To date, research on collateralized shares generally focuses on the relationship between financial distress and collateralized shares or focuses on the relationship between firm performance and collateralized shares during the period of Asia financial crisis.   Previous studies do not reach consistent conclusions about the relation between performance and collateralized shares.   Chiou et al. (2002) point out that collateralized shares of board of directors raise the possibility of being in distress.   Chen and Hu (2003) show that firms with higher shareholders' personal leverage will have a higher risk and worse performance in the future.   Kao et al. (2004) indicate that there is an inverse relationship between collateralized shares and firm performance and that the inverse relationship exists only for group-controlled firms. Kao et al. (2004) also provide evidence that monitoring mechanisms by institutional investors, creditors and dividend policy can effectively reduce the agency problem of shares used as collateral and thus can improve firm performance.

IV. EMPIRICAL DESIGN

Hypotheses Development

Share Collateralization and Earnings Management

This paper examines whether the directors' personal leverage has a negative impact on quality of financial reporting and eventually hurts firm performance.   Directors' share collateralization is their personal financial decision and should not be related to firm activities.   However, Claessen et al. (1999) point out that, except in Japan, most of listed firms in East Asia are affiliated with business groups or families.   For example, 65.6% of listed Taiwanese firms in 1996 are family-controlled.   Yen and Lee (2001) also find

that the 76% of listed firms in Taiwan are family-controlled and 66.45% of board of directors are controlled completely by families. For a family-controlled firm, most board members are related to the family and are involved in operations.   The opportunity to participate in management activities (including earnings reporting) makes the directors' personal loans linked to firm operations.

When the directors take their shares as collateral to raise debts, the amount of money they can borrow depends on the base value and price volatility of pledged shares. The directors of listed companies frequently raise and repay the loans from share collateralization. The stability of stock price benefits the directors, since they can borrow more money and get lower interest rates.   Thus, directors have incentive to smooth the reported earnings to increase the stability of the stock price.   Directors with a higher percentage of share pledge loans especially have strong incentive to smooth earnings because the financial institutions ask for more shares as collateral for stocks with higher price volatility.   Therefore, we propose the following hypothesis:

Hypothesis 1: The more shares collateralized by board of directors, the more earning-smoothing management the firm will engage in.

The function of the board of directors is to monitor the managers and to maximize shareholder value.   Directors who own shares of the firm will benefit directly from the increase in value.   Consequently, directors are willing to monitor managers and make sure managers maximize share value.   In theory, the governance function of directors improves as directors' ownership increases.   Nevertheless, once there exist conflicts of interest between directors and firms, directors who own more shares are more influential over firms to benefit themselves.   As to directors who have incentive to influence management to exercise extra earnings manipulation, higher ownership could help them achieve their purpose.   Based the above argument, the hypothesis 2 is proposed.

Hypothesis 2: The positive association between earnings management and pledged shares by board members is stronger when board members own more shares.

The Effect of Earnings Management Attributable to Share Collateralization on Firm Performance

In recent decades, researchers explore manager inventive regarding earnings management and the effect of accounting discretion on firm performance.   Basically, earnings management can be viewed from three perspectives – opportunistic behavior, efficient contracting and information perspectives (Holthausen, 1990).   Many studies support the opportunistic perspective that managers abuse their accounting discretion to mislead investors and to increase their wealth at the expense of other contract parties (Healy, 1985; Guidry el al., 1999; Klein, 2002; Chung et al., 2002).   Opportunism denotes unexpected managerial actions that transfer wealth to managers from creditors and shareholders without increasing aggregate wealth (Christie and Zimmerman, 1994). In contrast to the opportunistic perspective, the efficient contracting perspective proposes that firms use accounting methods in response to a variable economic environment while

the information perspective suggests that managers make accounting choices to convey inside information.   Since the purposes of earnings management are diverse, the relationship between earnings management could be positive or negative depending on the purpose of earnings management.

In this study, we focus on the effects of earnings management stirred by directors' share collateralization on performance.   When the earnings manipulation related to directors' share collateralization is opportunistic, the relation between earnings management due to directors' share collateralization for pledged loans and firm performance is expected to be negative.

Hypothesis 3: There exists a negative association between earnings management attributable to directors' share collateralization and firm performance.

Empirical Methodology

Earnings Management and the Characteristics of Board
To examine the association between earnings management and the characteristics of board, we employ the following regression.

$$EM = \beta_0 + \beta_1 * (PLEDGE) + \beta_2 * (PLEDGE * OWN\_T) + \beta_3 * (OWN\_T)$$
$$+ \beta_4 * (SIZE) + \beta_5 * (LEV) + \beta_6 * (BM) + \beta_7 * (IND) + year\ dummies + \varepsilon$$

(1)

where,
EM = the measurement of earnings management measured by absolute value of abnormal accruals. Abnormal accruals are accruals that can be manipulated and are typically used as measures of earnings management. This paper applies the absolute values of abnormal accruals as a measure of earnings management.   This measure is suggested by Warfield et al. (1995) and Bartov (2000).   Accruals are the difference between net income and cash flow from operations.   Accruals consist of discretionary and non-discretionary accruals.   I use a modified Jones (1991) model to estimate expected or nondiscretionary accruals for each two-digit industry code for each year from 1997-2004.   Abnormal or discretionary accruals are measured by subtracting normal accruals from total accruals.
$PLEDGE = PLED$, $PLED\_T$ or $DIFPLED\_T$.   These three variables measure the extent of shares of common stock held by board members and used as collateral to financial institutions to borrow money. $PLED$= share collateralization ratio of board members, defined as total shares owned by board members and pledged as collateral divided by the total shares outstanding. $PLED\_T$ =ln($PLED$+0.5/N), the logarithm transform of $PLED$ (share collateralization ratio by board members) which ranges practically from 0% to 100% and is highly skewed to the right. Here, 0.5/N is added to accommodate cases where $PLED$ is zero. $DIFPLED\_T$.=ln(1+$DIFPLED$), the logarithm transform of $DIFPLED$, the difference of share collateralization ratio of board members in a year and its preceding year ranging from -100% to 100% .   One is added to $DIFPLED$ to

accommodate cases where *DIFPLED* is equal to -100% (see Cox, 1970).

OWN_T = ln(*OWNERSHIP*), the logarithm transform of *OWNERSHIP*, where *OWNERSHIP* is ownership of board members defined as the total shares held by the board members divided by the total shares outstanding.

SIZE = logarithm of sales.

LEV = debt-to-asset ratio.

BM = ratio of book-to-market defined as book value of common equity divided by the market value of common equity.

IND = industry dummy.　The value is 1 for electronic firms; 0 otherwise.

　　Following Klein (2002), this paper includes 2 control variables: financial leverage (debt-to-asset ratio) and political costs (measured by logarithm of the sales).　In addition, Loebbecke et al. (1989) argue that financial statement fraud is related to rapidity of company growth.　If a company has been experiencing rapid growth, management may have motivation to misstate the financial statements during a downturn to give the appearance of stable growth.　Book-to-market value (*BM*) is used here to control for the effect of growth on possible accounting manipulation.　In addition, one industry dummy and seven year dummies are also employed to account for the unobserved variation.

　　Hypothesis 1 examines the association between earnings management and pledged shares by board members.　If hypothesis 1 is valid, then the regression coefficients (β_1 in equation (1)) of three share collateralization measures should be significantly positive, implying that share collateralization increases the willingness of board members to influence the accounting reporting.　Hypothesis 2 tests whether the positive association between earnings management and pledged shares proposed in hypothesis 1 is more severe for firms with high percentage of shares held by directors.　While regression coefficient β_1 in equation (1) represents the impact of collateralized shares on earnings management, the magnitude of $\beta_1 + \beta_2(OWN\_T)$ in the equation measures the impact of collateralized shares on earnings management conditional on different levels of board ownership.　When hypothesis 2 is supported, results should indicate positive and statistically significant estimates of β_2 on the interaction terms *PLED *OWN_T, PLED_T*OWN_T*, and *DIFPLED_T*OWN_T*, which implies that the impact of collateralized shares on earnings management varies directly with the holdings of board members; board members with higher ownership have higher incentive to engage in accounting manipulation due to share collateralization.

Firm Performance and Earnings Management Attributable to Share Collateralization

　　Hypothesis 3 tests whether the earnings management attributable to share collateralization hurts firm performance.　The following empirical model is employed to test the hypothesis:

$$PERF = \gamma_0 + \gamma_1 * (\Pr edicted\_EM) + \gamma_2 * (STD\_PERF) + \gamma_3 * (SIZE)$$
$$+ \gamma_4 * (LAG\_PERF) + \gamma_5 * (LEV) + \gamma_6 * (IND) + year\ dummies + \varepsilon$$

(2)

where,

PERF = CFO, *ROA*, *ROE* or *ROE1*.   These four variables are used to proxy for firm performance.   *CFO*=cash flow from operations deflated by lagged total assets. ROA= return on assets.   ROE= return on common equity.   *ROE1*= income before extraordinary items scaled by lagged common equity.

Predicted_EM = predicted abnormal accruals which is related to share collateralization by board members. $Predicted\_EM = \hat{\beta}_1 * (PLEDGE) + \hat{\beta}_2 * (PLEDGE * OWN\_T)$, where $\hat{\beta}_1$ and $\hat{\beta}_2$ are estimated from equation (1) and the variable *PLEDGE* is either PLED_T or *DIFPLED_T* depending on the level or change of share collateralization ratio.

STD_PERF = standard deviation of CFO, ROA, ROE or ROE1 over the sample period.

SIZE = logarithm of sales.

LAG_PERF = firm performance of the prior year.

LEV = debt-to-asset ratio.

IND = industry dummy.   The value is 1 for electronic firms; 0 otherwise.

   We use accounting profit ratios (cash flow from operations deflated by lag total assets, return on assets, return on equity and income before extraordinary items scaled by lagged common equity) to measure firm performance. The accounting profit ratio is an estimate of what management has accomplished and is not affected by investor psychology (Demsetz and Villalonga, 2000).   Predicted_EM is the predicted abnormal accruals related to directors' share collateralization, including the predicted component of earnings management stirred by the share collateralization ratio itself and predicted component brought about by the effect of ownership of directors on the association between earnings management and share collateralization ratio. γ_1 is expected to be negative, implying that earnings manipulation due to share collateralization reduces firm performance.

   Following Core et al. (1999), variables *STD_PERF* and *SIZE* are included in the regression equations to control for the possible effects of risk and size on accounting performance, respectively.   Variable *IND* is included in Equation (2) to control for the relatively high performance of the electronic industry in the Taiwan stock market.   Prior performance and year dummies are also employed to account for unobserved variations.

V. EMPIRICAL RESULTS

Sample

   This paper examines the relationship between earnings management and share collateralization by board directors and investigates whether earnings management attributable to share collateralization hurts firm performance.   Our sample consists of listed firms in Taiwan, and the data on collateralized shares held by directors and financial data are from the TEJ database. Since TEJ began to report the proportion of collateralized shares owned by stockholders in 1996 and the differences of the proportion of collateralized shares are measured, our sample period covers an 8-year period from 1997-2004.   We delete firm-year observations with (1) missing beginning-of-year total assets or insufficient data to calculate accruals; (2) fewer than six observations in any industry-and-year combination; (3) operating cash flows, earnings before extraordinary

items, discretionary accruals, or nondiscretionary accruals more than three standard deviations away from their respective means.   In addition, firms in the banking industry are also excluded because the nature of their financial reporting is different from those of firms in other industries.   Based on the above criteria, the total number of observations is 5344.

Tables 1 and 2 show the descriptive statistics and correlation coefficients among the variables for the sample firms.   As expected, the average total accruals (deflated by lagged total asset) are less than zero (-0.3%).   Because of depreciation, on average, reported net income is expected to be less than cash flows from operations.   Accruals are decomposed into the nondiscretionary (expected) and discretionary (abnormal) parts based on the modified Jones (1991) model.   The average nondiscretionary accrual (NDA) is -0.3% with standard deviation of 12.5%.   Since the average abnormal accrual (DA) is 0.0%, no evidence of systematically upward or downward earnings management is detected.   The absolute value of abnormal accruals (Abs(DA)) is employed to measure the extent of earnings management.   Table 1 shows that the average extent of earnings management is 10.2% of the lagged total assets.   The maximum value of Abs(DA) is 108.3%.   The average ownership of board of directors (OWNERSHIP) is 26.2% with the minimum of 0.13% and the maximum of 97.8%.   On average, the level of share collateralization ratio (PLED) and the change of share collateralization ratio (DIFPLED) are 2.9% and 0.0%, respectively.   The highest collateralization ratio in the sample is 51%.   The standard deviations of PLED and DIFPLED are 5.2% and 3.1%, respectively. The mean and standard deviation of sales of sample firms are 7.27 billion and 19.85 billion.   The mean and standard deviation of leverage (LEV) are 41.1% and 16.5%. On average, the book-to-market ratio (BM) is 1.039.   Cash flows form operations deflated by lagged assets (CFO), Returns on total asset (ROA), return on equity (ROE) and ratio of income before extraordinary items to equity (ROE1) are measures of firm performance.   The means of CFO, ROA, ROE and ROE1 are 5.2%, 4.642%, 4.831% and 4.086%, respectively.

Table 1: Descriptive Statistics for the sample firms, 1997-2004

Variable	N	Mean	Std Dev	Minimum	Maximum
ACC	5344	-0.003	0.133	-0.675	1.399
NDA	5344	-0.003	0.125	-1.081	1.147
DA	5344	0.000	0.165	-1.078	1.083
Abs(DA)	5344	0.102	0.130	0.000	1.083
OWNERSHIP	5344	0.262	0.140	0.001*	0.978
PLED	5344	0.029	0.052	0.000	0.510
DIFPLED	5344	0.000	0.031	-0.442	0.510
Sales	5344	7270081	19854050	6615	421669678
LEV	5344	0.411	0.165	0.021	0.977
BM	5344	1.039	0.989	0.044	24.935
CFO	5344	0.052	0.135	-1.079	2.947
ROA	5344	4.642	9.564	-101.260	82.640
ROE	5344	4.831	20.073	-212.670	116.750
ROE1	5344	4.086	19.260	-183.340	116.750

Sample description and variable definition:

The sample contains 5344 firm-year observations over 1997-2004.

* Ownership of directors of KPT INDUSTRIES LTD. (凱聚, Code1805) from May 2002 to December 2004 is only 0.13%.

ACC is total accruals, which are the difference between net income before extraordinary items and cash flows from operations, deflated by lagged total assets; *NDA* is nondiscretionary accruals estimated for each firm-year as the expected value of accruals based on the cross-sectional modified Jones (1991) model; *DA* is abnormal accruals that are the difference between total accruals and estimated expected accruals using the cross-sectional modified Jones (1991) model; *Abs(DA)* is the absolute value of discretionary accruals; *OWNERSHIP* is ownership of directors measured as the total shares held by the board members divided by the total shares outstanding; *PLED* is share collateralization ratio of directors defined as the total shares owned by board members and pledged to financial institutions as collateral divided by the total shares outstanding; *DIFPLED* is the difference of share collateralization ratio of board members in a year and its preceding year; *SALES* is the sales of the firm; *LEV* is debt deflated by total asset; *BM* is the book value of total common equity divided by the market value of common equity; *CFO* is cash flow from operations deflated by lagged total assets; *ROA* is return on total assets; *ROE* is return on common equity; *ROE1* is income before extraordinary items scaled by lagged common equity.

Table 2: Correlation Coefficients

Variable	NDA	DA	Abs(DA)	OWNERSHIP	PLED	DIFPLED	Ln(Sales)	LEV	BM	CFO	ROA	ROE	ROE1
ACC	0.185	0.669	0.286	0.065	-0.051	0.015	0.055	-0.003	-0.224	-0.639	0.430	0.439	0.409
	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(0.000)	(0.260)	(<.0001)	(0.838)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
NDA		-0.607	0.455	0.033	-0.020	-0.001	0.066	0.018	-0.067	-0.030	0.158	0.139	0.140
		(<.0001)	(<.0001)	(0.015)	(0.145)	(0.922)	(<.0001)	(0.186)	(<.0001)	(0.026)	(<.0001)	(<.0001)	(<.0001)
DA			-0.113	0.028	-0.026	0.013	-0.006	-0.016	-0.131	-0.494	0.229	0.250	0.225
			(<.0001)	(0.044)	(0.054)	(0.325)	(0.683)	(0.244)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
Abs(DA)				0.029	0.007	0.023	-0.013	0.080	-0.068	-0.201	0.025	-0.005	-0.005
				(0.033)	(0.629)	(0.094)	(0.339)	(<.0001)	(<.0001)	(<.0001)	(0.071)	(0.737)	(0.710)
OWNERSHIP					0.052	0.125	-0.084	-0.103	-0.171	0.091	0.197	0.209	0.219
					(0.000)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
PLED						0.279	0.116	0.163	0.127	-0.075	-0.136	-0.150	-0.162
						(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
DIFPLED							-0.005	-0.036	-0.055	-0.018	0.010	0.030	0.027
							(0.712)	(0.008)	(<.0001)	(0.188)	(0.482)	(0.030)	(0.050)
Ln(Sales)								0.184	-0.082	0.079	0.190	0.196	0.175
								(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
LEV									0.175	-0.289	-0.343	-0.374	-0.370
									(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
BM										-0.089	-0.368	-0.333	-0.331
										(<.0001)	(<.0001)	(<.0001)	(<.0001)
CFO											0.382	0.271	0.289
											(<.0001)	(<.0001)	(<.0001)
ROA												0.893	0.870
												(<.0001)	(<.0001)
ROE													0.963
													(<.0001)

The sample contains 5344 firm-year observations over 1997-2004.

ACC is total accruals, which are the difference between net income before extraordinary items and cash flows from operations, deflated by lagged total assets; *NDA* is nondiscretionary accruals estimated　　for each firm-year as the expected value of accruals based on the cross-sectional modified Jones (1991) model; *DA* is abnormal accruals that are the difference between total accruals and estimated expected accruals using the cross-sectional modified Jones (1991) model; *Abs(DA)* is the absolute values of discretionary accruals; *OWNERSHIP* is ownership of directors measured as the total shares held by the board members divided by the total shares outstanding; *PLED* is share collateralization ratio of directors defined as the total shares owned by board members and pledged to financial institutions as collateral divided by the total shares outstanding; *DIFPLED* is the difference of share collateralization ratio of board members between a year and its preceding year; *Ln(Sales)* is logarithm of the sales of the firm; *LEV* is debt deflated by total asset; *BM* is the book value of total common equity divided by the market value of common equity; *CFO* is cash flow from operations deflated by lagged total assets; *ROA* is return on total assets; *ROE* is return on common equity; *ROE1* is income before extraordinary items scaled by lagged common equity.

Cross-sectional Analyses

Table 3 reports the OLS regression estimates of three alternative measures of share collateralization ratio (*PLED*, *PLED_T* and *DIFPLED_*T) on absolute values of discretionary accruals for equation (1).   Columns (1), (2) and (3) of table 3 show that the three alternative measures of share collateralization ratio are significantly positively related to accounting discretions.   The coefficients on table 3 for *PLED*, *PLED_T* and *DIFPLED_T* are 0.211, 0.004 and 0.333 with t-values of 2.48, 2.52, and 2.82, respectively.   The results support the argument that directors' share collateralization raises the motivation of board member to influence the reported earnings (hypothesis 1). In column 4, *PLED_T* and *DIFPLED_T* are included and the results show that both the level and change of share collateralization ratio are positively associated with earnings manipulation (coefficients for *PLED_T* and *DIFPLED_T* are 0.003 and 0.295, and t-values are 2.05 and 2.44, respectively).

While the regression coefficient of β_1 in equation (1) is used to examine the impact of collateralized shares on earnings management, the magnitude of $\beta_1 + \beta_2 (OWN\_T)$ in equation (1) measures the impact of collateralized shares on the earnings management conditional at different levels of board ownership. β_2 is expected to be positive, implying that the increase of ownership of directors makes the positive association between earnings manipulation and share collateralization even more severe. Table 3 shows that the coefficients for the interaction terms *PLED*OWN_T* (in column #1), *PLED_T*OWN_T* (in column #2), and *DIFPLED_T*OWN_T* (in column #3) are 0.209, 0.003, and 0.218, respectively (t-values are 3.01, 3.04, and 3.10, respectively). Those coefficients are all significantly positive implying that board members' ability to manipulate earnings increases with their ownership, leading to the exaggerated impact of share collateralization on earnings manipulation.   Results shown in Table 3 support hypothesis 2.

The association between firm performance and the extent of accounting discretion attributable to directors' share collateralization is examined by equation (2).   The regression equation includes one of the four measures of firm performance (cash flows from operations deflated by lagged total assets, return on assets, return on equity, and income before extraordinary items deflated by total equity) as the dependent variable and includes one of two predicted measures of discretionary accruals (Predicted_EM1 and Predicted_EM2) estimated from equation (1) as the independent variable as proxy for earnings management attributable to directors' share collateralization.   *Predicted_EM1* is the predicted value of accounting discretion due to the level of share collateralization by board member conditional on board ownership, while *Predicted_EM2* is the predicted value of accounting discretion due to the change of share collateralization ratio conditional on board ownership.   The regression model also includes standard deviation of firm performance, logarithm of sales, and debt-to-asset ratio as control variables to control for the possible effects of firm risk, size and leverage on performance.   In addition, lagged firm performance, the industry dummy, and seven year dummy variables are included in the regression to control for the unobserved variation.

Table 3: Multivariate models of absolute values of abnormal accruals on three measures of share collateralization ratio

Variable[†]	Predicted sign	Dependent Variable: Abs (DA)			
		(1)	(2)	(3)	(4)
PLED	+	0.211 **			
		(2.48)			
PLED*OWN_T	+	0.209 ***			
		(3.01)			
PLED_T	+		0.004 **		0.003 **
			(2.52)		(2.05)
PLED_T*OWN_T	+		0.003 ***		0.003 ***
			(3.04)		(2.65)
DIFPLED_T	+			0.333 ***	0.295 **
				(2.82)	(2.44)
DIFPLED_T*OWN_T	+			0.218 ***	0.201 ***
				(3.10)	(2.83)
OWN_T	+	0.000	0.024 ***	0.005 *	0.022 ***
		(0.06)	(3.35)	(1.67)	(3.02)
SIZE (Unit: thousand)	?	-0.006 ***	-0.006 ***	-0.006 ***	-0.006 ***
		(-4.66)	(-4.44)	(-4.88)	(-4.49)
LEV	+	0.109 ***	0.107 ***	0.104 ***	0.107 ***
		(10.10)	(10.03)	(9.86)	(10.07)
BM	-	-0.002	-0.002	-0.003	-0.002
		(-1.09)	(-1.15)	(-1.33)	(-1.19)
IND		0.048 ***	0.048 ***	0.050 ***	0.049 ***
		(13.1)	(13.17)	(13.61)	(13.23)
Adjusted R^2		11.34%	11.35%	11.34%	11.45%
F-stat.(p value)		49.82 (0.00)	49.84 (0.00)	49.83 (0.00)	44.16 (0.00)

Sample is for 5344 Taiwan firm-years observations from 1997 to 2004.

*/**/*** represents statistical significance at the 10%, 5% and 1% levels, respectively.

Sample description and variable definition:

Abs(DA) is the absolute values of discretionary accruals; PLED is share collateralization ratio of directors defined as the total shares owned by board members and pledged to financial institutions as collateral divided by the total shares outstanding; PLED_T is defined as Ln(PLED+0.5/N), the logarithm transform of PLED (share collateralization ratio by board members) which takes values from 0 to 1 and is highly skewed to the right. Here, 0.5/N is added to accommodate the cases where PLED is zero; DIFPLED_T is defined as Ln(1+DIFPLED), the logarithm transform of DIFPLED, which is the difference of share collateralization ratio of board members between a year and its preceding year and takes value from -1 to 1. One is added to DIFPLED to accommodate cases where DIFPLED is equal to -1; OWN_T is defined as Ln(OWNERSHIP), the logarithm transform of OWNERSHIP, where OWNERSHIP is ownership of directors measured as the total shares held by the board members divided by the total shares outstanding; SIZE is the logarithm of sales; LEV is debt deflated by total asset; BM is the book value of total common equity divided by the market value of common equity; IND = industry dummy, the value is 1 for electronic firms; 0 otherwise.

[†] Coefficients on intercept and year dummies are omitted to conserve space.

Table 4: Firm performance on predicted earnings management due to share collateralization

Panel A: Multivariate models of firm performance on predicted earnings management due to level of share collateralization ratio (*Predicted_EM1*)

Variable[†]	Dep. Variable: Firm Performance			
	CFO	*ROA*	*ROE*	*ROE1*
Predicted_EM1	-0.473 ***	-63.772 ***	-158.335 ***	-142.232 ***
	(-3.48)	(-7.97)	(-9.25)	(-8.81)
STD_PERF	-0.0003 ***	-0.140 ***	-0.048 ***	-0.044 ***
	(-8.18)	(-7.53)	(-8.14)	(-7.82)
SIZE	0.012 ***	0.942 ***	2.301 ***	1.936 ***
	(8.92)	(12.20)	(13.92)	(12.53)
Lag_PERF	0.270 ***	0.572 ***	0529 ***	0.572 ***
	(21.98)	(48.26)	(41.25)	(45.77)
LEV	-0.190 ***	-10.020 ***	-26.239 ***	-22.911 ***
	(-17.62)	(-15.77)	(-18.96)	(-17.63)
IND	0.003	0.573 ***	0.573	0.168
	(0.97)	(2.71)	(1.32)	(0.41)
Adjusted R^2	20.40%	20.01%	47.43%	46.81%
F-stat.(p value)	106.22 (0.00)	103.68 (0.00)	371.36 (0.00)	362.30 (0.00)

Panel B: Multivariate models of firm performance on predicted earnings management due to change of share collateralization ratio (*Predicted_EM2*)

Variable	Dep. Var.: Firm Performance			
	CFO	*ROA*	*ROE*	*ROE1*
Predicted_EM2	0.493	-18.528	-111.854 ***	-84.157 **
	(1.55)	(-1.01)	(-2.83)	(-2.27)
STD_PERF	-0.0003 ***	-0.155 ***	-0.048 ***	-0.044 ***
	(-8.13)	(-8.37)	(-8.12)	(-7.76)
SIZE	0.0102 ***	0.880 ***	2.172 ***	1.818 ***
	(7.65)	(11.38)	(13.10)	(11.73)
Lag_PERF	0.272 ***	0.589 ***	0551 ***	0.595 ***
	(22.13)	(50.31)	(43.49)	(48.31)
LEV	-0.189 ***	-9.910 ***	-26.011 ***	-22.641 ***
	(-17.50)	(-15.51)	(-18.66)	(-17.31)
IND	0.006	0.628 ***	0.559	0.144
	(1.62)	(2.95)	(1.28)	(0.35)
Adjusted R^2	44.92%	44.12%	47.16%	46.44%
F-stat.(p value)	335.80 (0.00)	325.12 (0.00)	367.35 (0.00)	356.92 (0.00)

Sample is for 5344 Taiwan firm-years observations from 1997 to 2004.
//*** represents statistical significance at the 10%, 5% and 1% levels, respectively.
Predicted_EM1 is the predicted value of accounting discretion due to the level of share collateralization by board member impact of conditional on different levels of board ownership; *Predicted_EM2* is the predicted value of accounting discretion due to the change of share collateralization ratio conditional on different levels of board ownership; *STD_PERF is the* standard deviations of *CFO*, *ROA*, *ROE* or *ROE1* over the sample period; *Lag_PERF is* firm performance of the prior year; The definitions of the remaining variables please refer to note of Table 1.
[†] Coefficients on intercept and year dummies are omitted to conserve space.

The regression results of performance on earnings management due to share collateralization and other control variables are presented in Table 4. The results in panel A show that the predicted component of accounting discretion due to level of share collateralization (*Predicted_EM1*) is significantly negatively correlated with four measures of accounting performance (significant at 1% level), implying the earnings manipulation due to higher level of share collateralization indeed hurts firm performance. Panel B shows that the predicted component of accounting discretion due to change of share collateralization (*Predicted_EM2*) is also significantly negatively correlated with *ROE* and *ROE1* (t-values are -2.83 and -2.27, respectively), while the effects of *Predicted_EM2* on *CFO* and *ROA* are not significant (t-values are 1.55 and -1.01, respectively). These results indicate that the earnings manipulation due to increase of share collateralization ratio has negative impact on firm performance. Table 4 implies that agency problems become more severe with the motivation of earnings manipulation due to directors' share collateralization.

As to the control variables, the effect of standard deviation of accounting performance (*STD_PERF*) and the effect of leverage (*LEV*) on all the measures of firm performance are significantly negative, indicating that risk and leverage degrade firm performance during the sample period. Size and prior performance (*Lag_PERF*) have significantly positive impact on firm performance.

VI. CONCLUSION

The paper finds that personal financial loans of board members using firm shares as collateral to borrow money from banks motivates earnings management. Moreover, the influence of collateralized shares on earnings management increases directly with the ownership of board members, implying that board members with high ownership have stronger ability to exercise accounting manipulation due to share collateralization. The paper also finds that the predicted earnings management arising from personal financing behavior of board members has a significantly negative relation with firm performance. Overall, the results indicate that directors' share collateralization induces agency problems. Directors' share collateralization increases the motivation of manipulating earnings opportunistically and earnings management opportunism consequently hurts the firm performance.

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董監事股權質押、盈餘管理與公司績效相關性之研究

高蘭芬
國立高雄大學
陳安琳
國立中山大學

摘要：本研究探討董監事股權質押是否降低公司盈餘品質，以及與董監事股權質押有關的盈餘操縱行為是否傷害公司績效。董監事股權質押反應董監事的財務壓力，當董監事持股票向銀行借款，可借到的金額受到股票價格水準與股價波動性的影響。一般而言，董監事可以借到所質押股票價值的三成至六成，質押之股票的股價波動愈大所能借到的成數則愈少。為了取得較高的貸款成數而衍生的股價穩定的需求，使得董監事有穩定盈餘的誘因，盈餘平穩化的誘因也使得董監事個人的財務槓桿行為與公司財務報導產生連結。

董事會特性對公司財務報導的影響為公司治理研究中的重要研究課題（例如，Klein, 2002），大部份的研究強調在如何改善董事會結構以提高財務報導的可信度。然而在台灣董事會缺乏獨立性，甚至董監事本身就是代理衝突的來源，因此缺乏獨立性的董監事對財務報導的潛在負面影響也應受到重視。本研究的主要貢獻就是嘗試探討董監事個人的財務槓桿行為是否會降低公司盈餘報導的可信度。實證結果發現董監事股權質押與公司裁量性應計數的絕對值存在顯著正向關係，顯示董監事個人的融資行為會影響公司盈餘報導的品質。此外，董監事股權質押與裁量性應計數間的正向關係會隨著董監事持股的增加而增強，隱含當董監事與公司存在利益衝突時，董監事持股增加會使董監事股權質押所引發的盈餘品質下降的問題更為嚴重。實證結果也發現因董監事股權質押所引發的盈餘操縱與公司績效存在顯著負相關。整體而言，董監事的股權質押比率愈高，愈會基於自利的目的進行盈餘操縱，而因董監事股權質押所引發的盈餘操縱降低報導盈餘的可信度，也傷害公司的績效。

由於質押的股票仍保留控制權與現金分配權，董監事面對財務壓力時願意以其持股作擔保來借款，因為上市櫃股票流動性高，銀行比較願意接受上市櫃股票作為擔保品，這些原因使得董監事股權質押在台灣相當普遍。由於股票質押貸款屬於董監事個人行為，目前政府對董監事股權質押並未禁止，但仍要求上市櫃公司每月公開揭露董監事股權質押相關資訊，並提醒投資人

在投資時應考量董監事股權質押所可能帶來的影響。目前學者對董監事股權質押的研究幾乎都著重於對企業績效的影響，以及其與公司財務危機發生的關連性，尚未探討其對財務報導品質的影響。本研究的發現可以幫助管理當局了解董監事個人財務槓桿操作不僅對公司績效產生影響，也會降低公司財務報導的品質。

關鍵字：董監事質押、盈餘管理、董事會