Directors’ Share Collateralization, Earnings Management and Firm Performance

董監事股權質押、盈餘管理與公司績效相關性之研究

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Abstract

This study examines the association between director’s share collateralization and earnings manipulation. The results indicate that directors’ share collateralization is significantly positive with earnings management and the positive association is stronger when the directors own more shares. Earnings management attributable to boards’ share collateralization causes severe agency problems and hurts firm performance. I find that earnings management attributable to share collateralization is negative related with firm performance.

Keyword: Share collateralization, Directors’ personal leverage, Board of directors, Earnings management, Abnormal accruals.
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中文摘要

本研究探討董監事持股質押是否降低公司盈餘品質，以及與董監事質押有關的盈餘操縱行為是否傷害公司績效。研究結果顯示，董監事股權質押與公司異常應計項目存在顯著正向關係，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，董監事質押與異常應計項目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質押所引發的盈餘品質下降的問題更嚴重。實證結果也發現因董監事質押所引發的盈餘操縱與公司績效存在顯著負相關。

關鍵字：董監事質押、盈餘管理、董事會
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1. Introduction

The effects of board-of-director characteristics and ownership structure on financial reporting process have been a popular research topic in corporate governance (for example, Klein (2002), Fan and Wong (2002), and Peasnell et al. (2000)). Researchers focus on the monitoring role of board of directors and examine the effectiveness of the board characteristics (such as board size, independent directors, and remuneration committees) as internal corporate governance mechanisms. However, there is a growing literature suggesting that the boards of directors are ineffective and even address the interest conflicts between board of directors and outside shareholders. In Asia, most listed companies are controlled by families or owner groups and the role of board of directors in a family-controlled business attracts attentions of the SEC and investors. Typically, the controlling groups have tight control over the listed companies and the majority shareholders serve as the chief executive officer (CEO) and directors of the companies. Board members could influence the CEO’s decisions including financial reporting to maximize the wealth of directors (or controlling families) and expropriate the benefit of outside minority shareholders when interest conflicts exist between directors (or families) and outsider shareholders.

Share collateralization of directors which is the focus of this paper, reflects the financial pressure of directors. Because shares of listed firms are widely accepted by financial institutions as collaterals and because the voting rights and control rights of the collateralized shares are still kept by shareholders, many directors facing financial pressure prefer to collateralize their shares at the financial institutions to borrow
money. However, directors who pledge their shares as collaterals need to pledge more shares once the market value of the collateralized shares falls below the required margin. Due to threat of margin requirement, the collateralizing directors have incentives to manage reported earnings to avoid the drop of shares prices leading to the downgrade of the quality of reported earnings. The potential agency conflicts related to the creditability of accounting reporting between directors and outside shareholder are worth examining. However, since the share collateralization is directors’ personal financial decisions, most countries (such as USA and Hong Kong) do not impose any regulation on share collateralization even disclosure requirement. Lack of the information about the personal leverage of board members, little research works on this issue. Since Taiwan SEC requires the listed firms to disclose the directors’ share collateralization information, I have an opportunity to study the agency problems of share collateralization by board members.

Agency problems of share collateralization by directors have been an important governance issue in Taiwan after the Asian financial crisis in 1997. The main reason is that the financial distress Taiwanese companies generally experience high percentage of share collateralization by directors. Not only for distressed companies, according to statistics from the securities exchange, board of directors in Taiwan pretty much collateralize their shares for personal funding. Up to November 2000, the year after the Asian financial crisis in 1997 and Taiwan local financial turmoil in 1998, only 28% (147 firms) of the listed firms did not have shares collateralized by their boards of directors. There are 312 firms (34% of the listed firms) with 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) lower than 20%. There are 110 firms (21%) with collateralization ratio between 20% and
50%; 103 firms (20%) with collateralization ratio higher than 50%; 21 firms (4%) with collateralized share ratio higher than 90%; 17 firms (3.24%) with collateralization share ratio between 80% and 90%; 16 firms (3.05%) with collateralization ratio between 70% and 80%. Moreover, 40% of the stocks traded in the over-the-counter market experience share collateralization by their board of directors.

In this study, I examine the relation between earnings management and share collateralization by board members and investigate whether the earnings management attributable to share collateralization hurts firm performance. There are two main contributions from this study. The first contribution is that this paper extents the research about the effects of board-of-director characteristics on earnings management. To date, the literature has focus on identify the association between characteristics of board of directors and financial report quality. Especially, the link between the dependence of board and activities related to earnings manipulation behaviors has been most emphasized (Dechow et al., 1996; Beasley, 1996; Klein, 2002). However, the percentage of listed Asian companies affiliated with business groups are quite high (Claessens, Fan, and Lang, 2002). It is easy to find that most of boards of directors of listed firms in Asia are controlled by a family and majority of board members lack of independence. Chen, Fan and Wong (2004) find that the governance function of board of directors is weak in China. Thus, it is not comprehensive to only focus on the governance role of board without considering the interest conflicts between board of directors and outside shareholders. The second contribution of this paper is to study the interest conflicts induced by board members. In this paper, I address that directors’ personal leverage conducts could induce the agency conflicts on firms based on the evidence of management’s opportunistic
earnings manipulation and argue that the requirement by SEC to disclosure the information to investors is necessary.

Share collateralization by board of directors is very popular and is an important issue of corporate governance in Taiwan. However, previous studies about structure of board of directors on earnings management or earnings quality generally neglect the effect of share collateralization on the earnings reporting. This paper tries to make up the deficiency.

2. The mechanisms of share collateralization

Stock investors in Taiwan can take their shares to the 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 collaterals. The debt raisers who collateralize their shares at the financial institutions still keep the voting rights and the cash flow rights of the 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 up to one year. The base value of the collateralized shares is measured based on 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 collaterals, the position of collateralized shares will be forced
to be closed.

There is no particular regulation on the share collateralization of minority shareholders. However, Taiwan SEC asks the firms with their directors collateralizing shares at financial institutions to disclose the details of share collateralization on the website of Taiwan Stock Exchange everyday. 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 we 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\(^1\) (October 7, 2000) reports that the minority shareholders collateralize their shares to increase the leverage on their stock investments. The Commercial Times also indicates that the directors collateralize their shares and use the fund 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. The 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. Anecdote evidence shows that the capital from collateralized shares is hardly contributed to firms’ projects.

3. Related literature

3.1 Board-of-director characteristics, corporate governance and financial reporting quality

The research to date in this area examines the association between the

\(^1\) The status of The Commercial Times in Taiwan is similar to that of The Wall Street Journal in US.
characteristics of board of directors (such as size and composition of the board, number of outside independent directors, and remuneration committees) and financial reporting quality, earnings manipulation and financial statement fraud (McMullen, 1996; Dechow et al., 1996; Beasley, 1996; Carcello and Neal, 2000; Klein, 2002; Anderson et al., 2004). Generally speaking, these studies suggest that independence of board or auditing committee has linkage with the activities associated with earnings manipulation behaviors. For example, Beasley (1996) and Dechow et al. (1996) fine that the proportion of independent directors on the board (used to proxy for board independence) is inversely related to likelihood of financial statement fraud. Klein (2002) also finds a negative association between the abnormal accruals and board independence.

Since the basic design of corporate governance is that the shareholders elect the board of directors and then board of directors selects the management, researchers focus on the monitoring role of board of directors and examine the effectiveness of the board membership and characteristics as internal corporate governance mechanisms. However, for family-controlled businesses, board of directors is controlled by families or owner groups and is inefficient on behalf of shareholders in monitoring management which is common dominated by controlling family. Even for a non family-controlled firm, it is not unusual that board itself is the source of conflicts of interest. In common practice, many firms establish conflicts of interest policy to prevent a board member develops an actual or potential or conflict of interest with the company (for example, FedEx, Micorn).

Previous studies find that the deviation of ownership (cash flow right) and control right of controlling shareholders (or directors) in Asia produces agency problem and decreases firm value (Claessens et al., 2000) and therefore 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 and cash flow rights make the agency conflicts more severe and the purpose of providing accounting information by management is not to reflect the firm’s true transaction. For 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 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. Share collateralization is quite popular for public firms in Taiwan. Related research in accounting discipline finds that the share collateralization decreases the informativeness of accounting earnings (Kao and Chiou, 2002). 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 worries 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 therefore 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. Once the relationship is valid, the arguments by Kao and Chiou (2002) can be more powerful.

3.2 Share collateralization by board of directors and firm performance

Due to lack of the disclosure of personal leverage of board members, little
research ever examines the agency problem of share collateralization by board of directors and the relationship between share collateralization and firm performance. The listed firms in Taiwan are required to disclosure periodically the information of share collateralization by the board members, manager and major shareholders. This disclosure requirement provides data for researcher to study the effect of the directors’ personal loan 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 conclusion 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 firms with a 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.

4. Empirical design

4.1 Hypotheses development

(1). Share collateralization and earnings management

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 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). To date, researcher mainly focuses on the overseeing functions of board of directors. For example, Beasley (1996) and Dechow et al. (1996) find that board independence is inversely related to likelihood of financial statement fraud. And, a negative association between the abnormal accruals and board independence are documented by Klein (2002). However, board of directors in Asia is often controlled by families or owner groups and it is inefficient on behalf of outside minority shareholders in monitoring management and controlling shareholders. Previous studies find that the deviation of ownership and control right of controlling families (or directors) in Asia produces agency problem and decreases firm value (Claessens et al., 2000) and therefore hurts the quality of reported earnings (Fan and Wong, 2002).

This paper examines whether the directors’ personal leverage has negative impact on quality of financial reporting process and eventually hurts firm performance. A director is not prohibited to pledge his shares for a personal loan. Share collateralization is personal financial decision of board members and should not be related to firm activities under the assumption of separation between ownership and management. 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 is controlled completely by families. For a family-controlled or group-controlled firm, majority of board members are related to the control family and inside directors commonly involve in operations. The
opportunity of participating in management activities (including earnings reporting process) makes the director’s personal loan linked to firm operations.

Due to the liquidity of the listed stocks, financial institutions in Taiwan prefer the debt-raisers to use listed shares as collaterals. The directors usually also prefer to collateralize their shares at the financial institutions because the collateralizing shareholders still keep the voting rights and the cash flow rights of the shares unless they default. Therefore, the change of share collateralization level can reflects the personal financial pressure of an individual director. Due to worries 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. Kao and Chiou (2002) show that share collateralization of board members decreases the informativeness of accounting earnings, measured by the earnings-return relation. The findings provide evidence of the possible earnings manipulation and decrease of earnings quality attributable to share collateralization of board members. Based on the reasoning, I propose the following hypothesis:

**Hypothesis 1: The more shares collateralized by board of directors, the higher the extent of earnings management.**

The function of the board of directors is to monitor the managers and to maximize shareholder value. However, directors should have proper incentives for performing their job well. One incentive comes from having directors own shares of the company they oversee. Since directors who own shares of the firm will benefit directly from the increase in values, they are willing to monitor manager and make sure managers maximize share value. Thus, 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 ownership
are more influential over firms to benefit their own. For directors who have incentives to influence management to exercise extra earnings manipulation, the more ownership could help them to achieve their purposes. 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.

(2) The effect of earnings management attributable to share collateralization on Firm performance

Shares collateralization by boards of directors or other large shareholders is considered as personal conducts and is not prohibited. In theory, it should be irrelevant to the operations of the firm under the separation of ownership and management. However, the separation of ownership and management does not fit firms in Taiwan leading to a connection between personal share collateralization of board members and firm performance.

To date, research on collateralized shares supports that share collateralization by board members is related to financial distress and future worse performance (Chiou et al, 2002; Chen and Hu, 2003; Kao et al., 2004). The possibility of being in distress increases with the level of share collateralization of board of directors (Chiou et al., 2002). Researchers also find that firms with higher shareholders’ personal leverage tent to have higher risk (Chen and Hu, 2003) and worse future performance (Chen and Hu, 2003; Kao et al., 2004). Kao et al. (2004) indicate that there is an inverse relationship between collateralized shares and next period firm performance for family-controlled firms. In addition, they show that outside governance mechanisms can effectively reduce the agency problem of shares used as collateral and thus can
improve firm performance. Due to worries of the agency conflicts induced by the directors’ personal leverage, Taiwan’s SEC requires the listed firms to disclose the information of share collateralization by the board members, manager and large shareholders and remind the investors to notice this disclosure before making investment.

In this paper, in addition to reexamining the association between firm performance and share collateralization, I emphasize on opportunistic earnings manipulation of management induced by share collateralization of directors (proposed by hypothesis 1) and study whether earnings management attributable to share collateralization by directors hurts firm performance. Therefore, I propose the following hypothesis.

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

### 4.2 Empirical methodology

(1) Earnings management and the characteristics of board

To examine the association between earnings management and the characteristics of board, I employ the following regression.

\[
EM = \beta_0 + \beta_1(PLEDGE) + \beta_2(PLEDGE \times OWN \_T) \\
+ \beta_3(OWN \_T) + \beta_4(SIZE) + \beta_5(LEV) \\
+ \beta_6(BM) + \beta_7(IND) + \text{year dummies} + \varepsilon
\] (1)

where,

\( EM \) = the measurement of earnings management measured by absolute value of abnormal accruals. Abnormal accruals are accruals that can be manipulated and is typically used as the measure of earnings management. This paper applies absolute values of abnormal accruals as a measure of earnings management. This measure is suggested by Warfiled 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.

\[
PLEDGE = PLED, \ PLED_T \text{ or } DIFPLED_T.
\]

These three variables measure the extent of shares of common stock that is held by board members and used as collateral to financial institutions to borrow money. \( PLED \) is the share collateralization ratio of board members which is defined as total shares owned by board members divided by the total shares outstanding. \( PLED_T = \ln(PLED+0.5/N) \), the logarithm transformation of \( PLED \) (share collateralization ratio by board members) which is practically from 0% to 100% and is highly skewed to the right. Here, 0.5/N is added to accommodate the cases where \( PLED \) is zero. \( DIFPLED_T = \ln(1+DIFPLED) \), the logarithm transformation of \( DIFPLED \) which is the difference of share collateralization ratio of board members between a year and its preceding year with range from -100% to 100%. One is added to \( DIFPLED \) to accommodate the case where \( DIFPLED \) is equal to -100% (Cox, 1970).

\( OWN_T = \ln(OWNERSHIP) \), the logarithm transformation 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.

\( SIZE = \text{logarithm of sales}. \)

\( LEV = \text{debt-to-asset ratio}. \)

\( BM = \text{book value to total common equity divided by the market value of common} \)
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 with rapid 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 yearly 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 ($\beta_1$ in equation (1)) of three share collateralization measures should be significantly positive implying that share collateralization increases the willingness of board member 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 firm with high percentage of share holding by board members than in firm with lower percentage. While regression coefficient $\beta_1$ 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, statistically significant estimates $\beta_2$ s on the interaction terms $PLER*OWN_T$, $PLER_T*OWN_T$, and $DIFPLER_T*OWN_T$, which implies that the impact of
collateralized shares on earnings management varies directly with the holdings of board members and board members with higher ownership have higher incentive to engage in accounting manipulation due to share collateralization.

(2). Firm performance and earnings management attributable to share collateralization

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

\[ \text{PERF} = \gamma_0 + \gamma_1 \times (\text{Predicted EM}) + \gamma_2 \times (\text{STD_PERF}) + \gamma_3 \times (\text{SIZE}) + \gamma_4 \times (\text{LAG_PERF}) + \gamma_5 \times (\text{LEV}) + \gamma_6 \times (\text{IND}) + \text{year dummies} + \varepsilon \]  

where,

\[ \text{PERF}=\text{CFO}, \text{ ROA}, \text{ ROE or ROE1}. \] These four variables are used to proxy for firm performance.  \( \text{CFO}=\text{cash flow from operations deflated by lagged total assets.} \)

\( \text{ROA}=\text{return on assets.} \  \text{ROE}=\text{return on common equity.} \  \text{ROE1}=\text{income before extraordinary items scaled by lagged common equity.} \)

\( \text{Predicted EM} = \text{predicted component of abnormal accruals that is related to share collateralization by board members.} \)

\( \text{Predicted EM} = \hat{\beta}_1 \times (\text{PLEDGE}) + \hat{\beta}_2 \times (\text{PLEDGE \times OWN \_T}), \) where \( \hat{\beta}_1 \) and \( \hat{\beta}_2 \) are the estimates of equation (1) and the variable \text{PLEDGE} is either \text{PLED\_T} or \text{DIFFPLED\_T} depending on level or change of share collateralization ratio are used.

\( \text{STD_PERF} = \text{standard deviation of CFO, ROA, ROE or ROE1 over the sample period.} \)

\( \text{SIZE} = \text{logarithm of sales.} \)

\( \text{LAG_PERF} = \text{firm performance of the prior year.} \)
$\text{LEV} = \text{debt-to-asset ratio}.$

$\text{IND} = \text{industry dummy.}$ The value is 1 for electronic firms; 0 otherwise.

I 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). $\text{Predcited}_\text{EM}$ is the predicted component of abnormal accruals that is related to share collateralization by board members, including the predicted component of earnings management induced by share collateralization ratio itself and predicted component induced by the effect of ownership of directors on association between earnings management and share collateralization ratio. The sign of coefficient $\gamma_1$ is expected to be negative, implying that these earnings manipulation due to share collateralization reduces the firm performance.

Follow Core et al. (1999), variables $\text{STD.PERF}$ and $\text{SIZE}$ are included in the regression equations to control for the possible effects of risk and size on accounting performance, respectively. Variable $\text{IND}$ is included in Equations (2) to control for the relatively high performance of electronic industry in Taiwan stock market. Prior period performance and yearly dummies are also employed to account for the unobserved variation.

5. Empirical Results

5.1 Sample

This paper examines the relationship between earnings management and share collateralization by board member and investigates whether the 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 boards of 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 a 8-year period from 1997-2004. I 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 reports is different from those of firms in other industries. Based on the above criteria, the total number of observations is 5433.

Table 1 shows the descriptive statistics for the sample firms. The average total accruals (deflated by lagged total asset) are less than zero (-0.3%) and meet the expectation. Because of the depreciation, on average the reported net income is expected to be less than cash flows from operation. Accruals are decomposed into the nondiscretionary (expected) and discretionary (abnormal) parts based on the modified Jones (1991) model. The average nondiscretionary accruals (NDA) are -0.3% with standard deviation of 12.5%. The average abnormal accruals (DA) are 0.0% and thus no evidence of systematic upward or downward earnings management is detected. The absolute values of abnormal accruals (Abs(DA)) are employed to measure the extent of earnings management. Table 1 report that the average extent of earnings management is 10.2% of the 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 pledge 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 billions and 19.85 billions. 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 \((ROEI)\) are measures of firm performance. The means of \(CFO, ROA, ROE\) and \(ROEI\) are 5.2%, 4.642%, 4.831% and 4.086%, respectively.

**[Table 1 about here]**

### 5.2 Cross-sectional analyses

Table 2 reports the OLS regression estimates of 3 alternative measures of share collateralization ratio (level of share collateralization ratio \(PLED\), logarithm transformation of share collateralization ratio \(PLED_T\) and logarithm transformation of change of share collateralization ratio \(DIFPLED_T\)) on absolute values of discretionary accruals for equation (1). Columns (1), (2) and (3) of table 2 shows that 3 alternative measures of share collateralization ratio are significantly positively related to accounting discretions. The coefficients on Table 2 for \(PLED\), \(PLED_T\) and \(DIFPLED_T\) are 0.211, 0.004 and 0.333 with t-values are 2.48, 2.52, and 2.82, respectively. The results support the argument that share collateralization increases 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 level and change of share collateralization ratio are positively associated with
measures of 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 regression coefficient $\beta_1$ 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 earnings management conditional on different levels of board ownership. The sign of coefficient $\beta_2$ is expected to positive implying that the increase of ownership of directors makes the positive association between earnings manipulation and share collateralization more severe. Table 2 shows 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 which is consistent with the argument that more ownership held by board member can increase the board members’ ability to manipulate the earnings, and thus exaggerate the impact of share collateralization on earnings manipulation. Results of Table 2 support the hypotheses 2.

[Table 2 about here]

The association between the firm’s performance and the extent of accounting discretion attributable to share collateralization by board member is examined using a cross-sectional multiple regression (equation (2)). The regression equation includes one of the four measures of firm’s 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 a dependent variable and includes two predicted measures of discretionary accruals ($PredictedEM1$ and $PredictedEM2$) estimated from equation (1) and (2) as independent variable as proxy for earnings
management attributable to share collateralization. PredictedEM1 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, while PredictedEM2 is the predicted value of accounting discretion due to the change of share collateralization ratio conditional on different levels of 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 values of firm’s performance, one industry dummy, and seven year dummy variable are contained in the regression to control for the unobserved variation.

The regression result of performance on earnings management due to share collateralization and other control variables are presented in Table 3. The results in panel A show that the predicted component of accounting discretion due to level of share collateralization (PredictedEM1) 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 the performance. The effect of change of share collateralization on firm performance has similar results to the effect of level. Panel B shows that the predicted component of accounting discretion due to change of share collateralization (PredictedEM2) is significantly negatively correlated with ROE and ROE1 (t-values are -2.83 and -2.27, respectively), while the effects of PredictedEM2 on CFO and ROA are not supported (t-values are 1.55 and -1.01, respectively). The results indicate that the earnings manipulation due to increase of share collateralization ratio has negative impact on firm performance. Table 3 implies that agency problems associated with the motivation of earnings manipulation due to share collateralization by board member.
As to other control variables, the effect of standard deviation of each accounting performance (\textit{STD\_PERF}) and the effect of leverage (\textit{LEV}) on all measures of firm performance are significantly negative, indicating that high risk and leverage firms have worse performance during the sample period. Size and prior period performance (\textit{Lag\_PERF}) have significantly positive impact on firm performance.

[Table 3 about here]

6. Conclusion

The paper finds that the personal financial loan of board members using firm shares as collateral to borrow money from banks increases the managers’ motivation to manage earnings. Moreover, the influence of collateralized shares on earnings management increases directly with the ownership of board members, implying that board members with more ownership have higher ability to influence the accounting manipulation due to share collateralization. The paper also finds that the predicted component of earnings management arising from personal financing behavior of board members has a statistically significant negative relation with firm operating performance. Overall, the results indicate that share collateralization by board members could induce the agency problems. The share collateralization by board member increases the motivation of management to manipulate earnings opportunistically and the management opportunism finally hurts the firm performance.
Reference


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

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

Sample description and variable definition:

- * Ownership of directors of KPT INDUSTRIES LTD (凯聚, 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 that are 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 which is measured as the total shares held by the board members divided by the total shares outstanding.

**PLED** is share collateralization ratio of directors which is defined as the total shares owned by board members and pledged to financial institutions as collaterals divided by the total shares outstanding.

**DIFPLED** is the difference of share collateralization ratio of board members between 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 Multivariate models of absolute values of abnormal accruals on three measures of pledged share ratio

<table>
<thead>
<tr>
<th>Variable‡</th>
<th>Predicted sign</th>
<th>Dependent Variable: Abs (DA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLED</td>
<td>+ 0.211 **</td>
<td>(2.48)</td>
</tr>
<tr>
<td>PLED*OWN_T</td>
<td>+ 0.209 ***</td>
<td></td>
</tr>
<tr>
<td>PLED_T</td>
<td>+ 0.004 **</td>
<td>(2.52)</td>
</tr>
<tr>
<td>PLED_T*OWN_T</td>
<td>0.003 ***</td>
<td>(3.04)</td>
</tr>
<tr>
<td>DIFPLED_T</td>
<td>+ 0.333 ***</td>
<td>(2.82)</td>
</tr>
<tr>
<td>DIFPLED_T*OWN_T</td>
<td>0.218 ***</td>
<td>(3.10)</td>
</tr>
<tr>
<td>OWN_T</td>
<td>+ 0.000 0.024 ***</td>
<td>0.005 * 0.022 ***</td>
</tr>
<tr>
<td>SIZE (Unit: thousand)</td>
<td>? -0.006 ***</td>
<td>-0.006 ***</td>
</tr>
<tr>
<td>LEV</td>
<td>+ 0.109 0.107 ***</td>
<td>0.104 *** 0.107 ***</td>
</tr>
<tr>
<td>BM</td>
<td>- (-1.09) - (-1.15)</td>
<td>- (-1.33) - (-1.19)</td>
</tr>
<tr>
<td>IND</td>
<td>0.048 0.048 ***</td>
<td>0.050 0.049 ***</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>11.34% 11.35%</td>
<td>11.34% 11.45%</td>
</tr>
<tr>
<td>F-stat.(p value)</td>
<td>49.82 (0.00) 49.84 (0.00)</td>
<td>49.83 (0.00) 44.16 (0.00)</td>
</tr>
</tbody>
</table>

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 which is defined as the total shares owned by board members and pledged to financial institutions as collaterals divided by the total shares outstanding.
- PLED_T is defined as Ln(PLE+0.5/N), the logarithm transformation 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 transformation 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 DIFFLED to accommodate the case where DIFPLED is equal to -1.
- OWN_T is defined as Ln(OWNERSHIP), the logarithm transformation of OWNERSHIP, where OWNERSHIP is ownership of directors which is 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 assets.
- 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 3 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)

<table>
<thead>
<tr>
<th>Variable†</th>
<th>CFO</th>
<th>ROA</th>
<th>ROE</th>
<th>ROE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted EM1</td>
<td>-0.473***</td>
<td>-63.772***</td>
<td>-158.335***</td>
<td>-142.232***</td>
</tr>
<tr>
<td></td>
<td>(-3.48)</td>
<td>(-7.97)</td>
<td>(-9.25)</td>
<td>(-8.81)</td>
</tr>
<tr>
<td>STD_PERF</td>
<td>-0.0003***</td>
<td>-0.140***</td>
<td>-0.048***</td>
<td>-0.044***</td>
</tr>
<tr>
<td></td>
<td>(-8.18)</td>
<td>(-7.53)</td>
<td>(-8.14)</td>
<td>(-7.82)</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.012***</td>
<td>0.942***</td>
<td>2.301***</td>
<td>1.936***</td>
</tr>
<tr>
<td></td>
<td>(8.92)</td>
<td>(12.20)</td>
<td>(13.92)</td>
<td>(12.53)</td>
</tr>
<tr>
<td>Lag_PERF</td>
<td>0.270***</td>
<td>0.572***</td>
<td>0.529***</td>
<td>0.572***</td>
</tr>
<tr>
<td></td>
<td>(21.98)</td>
<td>(48.26)</td>
<td>(41.25)</td>
<td>(45.77)</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.190***</td>
<td>-10.020***</td>
<td>-26.239***</td>
<td>-22.911***</td>
</tr>
<tr>
<td></td>
<td>(-17.62)</td>
<td>(-15.77)</td>
<td>(-18.96)</td>
<td>(-17.63)</td>
</tr>
<tr>
<td>IND</td>
<td>0.003</td>
<td>0.573***</td>
<td>0.573</td>
<td>0.168</td>
</tr>
<tr>
<td></td>
<td>(0.97)</td>
<td>(2.71)</td>
<td>(1.32)</td>
<td>(0.41)</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>20.40%</td>
<td>20.01%</td>
<td>47.43%</td>
<td>46.81%</td>
</tr>
<tr>
<td>F-stat.(p value)</td>
<td>106.22 (0.000)</td>
<td>103.68 (0.000)</td>
<td>371.36 (0.000)</td>
<td>362.30 (0.000)</td>
</tr>
</tbody>
</table>

Panel B: Multivariate models of firm performance on predicted earnings management due to change of share collateralization ratio (Predicted EM2)

<table>
<thead>
<tr>
<th>Variable†</th>
<th>CFO</th>
<th>ROA</th>
<th>ROE</th>
<th>ROE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted EM2</td>
<td>0.493</td>
<td>-18.528</td>
<td>-111.854***</td>
<td>-84.157**</td>
</tr>
<tr>
<td></td>
<td>(1.55)</td>
<td>(-1.01)</td>
<td>(-2.83)</td>
<td>(-2.27)</td>
</tr>
<tr>
<td>STD_PERF</td>
<td>-0.0003***</td>
<td>-0.155***</td>
<td>-0.048***</td>
<td>-0.044***</td>
</tr>
<tr>
<td></td>
<td>(-8.13)</td>
<td>(-8.37)</td>
<td>(-8.12)</td>
<td>(-7.76)</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.0102***</td>
<td>0.880***</td>
<td>2.172***</td>
<td>1.818***</td>
</tr>
<tr>
<td></td>
<td>(7.65)</td>
<td>(11.38)</td>
<td>(13.10)</td>
<td>(11.73)</td>
</tr>
<tr>
<td>Lag_PERF</td>
<td>0.272***</td>
<td>0.589***</td>
<td>0.551***</td>
<td>0.595***</td>
</tr>
<tr>
<td></td>
<td>(22.13)</td>
<td>(50.31)</td>
<td>(43.49)</td>
<td>(48.31)</td>
</tr>
<tr>
<td>LEV</td>
<td>-0.189***</td>
<td>-9.910***</td>
<td>-26.011***</td>
<td>-22.641***</td>
</tr>
<tr>
<td></td>
<td>(-17.50)</td>
<td>(-15.51)</td>
<td>(-18.66)</td>
<td>(-17.31)</td>
</tr>
<tr>
<td>IND</td>
<td>0.006</td>
<td>0.628***</td>
<td>0.559</td>
<td>0.144</td>
</tr>
<tr>
<td></td>
<td>(1.62)</td>
<td>(2.95)</td>
<td>(1.28)</td>
<td>(0.35)</td>
</tr>
<tr>
<td>Adjusted R2</td>
<td>44.92%</td>
<td>44.12%</td>
<td>47.16%</td>
<td>46.44%</td>
</tr>
<tr>
<td>F-stat.(p value)</td>
<td>335.80 (0.000)</td>
<td>325.12 (0.000)</td>
<td>367.35 (0.000)</td>
<td>356.92 (0.000)</td>
</tr>
</tbody>
</table>

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.