

## Corporate Governance and Capital Structure: Evidence from Taiwan SMEs<sup>1</sup>

Hsien-Chang Kuo

Department of Banking and Financing, Takming University of Science and Technology  
56, Sec. 1, Huanshan Rd., Neihu District, Taipei, TAIWAN  
Tel: +886-2-26585801 E-mail: hckuo@takming.edu.tw

Lie-Huey Wang (Correspondence author)

Department of Finance, Ming Chuan University  
250, Sec. 5, Zhong Shan N. Rd., Taipei, TAIWAN  
Tel: +886-2-28824564 E-mail: lhwang@mail.mcu.edu.tw

Hui-Wen Liu

Department of Banking and Finance, National Chi Nan University  
University Rd. Puli, Nantou Hsien, TAIWAN  
Tel: +886-03-3810658 E-mail: s96214521@ncnu.edu.tw

**Abstract:** This study examines the effects of corporate governance on capital structure, using the data of 145 small and medium-sized enterprises (SMEs) listed on the Taiwan Stock Exchange over the period 2000-2007. The results show that, when there is a high divergence between shareholdings and director seats, conventional industries prefer to use long-term debt financing, while high-tech industries prefer the opposite. For large firms, block-holders and independent directors prefer lower long-term debt financing, but family shareholders and managerial directors prefer lower short-term debt financing. We also find that family shareholding ratio and family directors are the two most important factors that affect the SMEs' debt ratio. The higher the family shareholding ratio is, the more short-term debt financing will be. However, family directors can reduce the incidence of using short-term debt to support long-term financial needs.

**JEL Classifications:** C23, G32, G34

**Keywords:** Small and medium-sized enterprises (SMEs), Corporate governance, Capital structure

### 1. Introduction

After Modigliani and Miller (1958) proposed their capital structure (MM) theory, Jensen and Meckling (1976) and Myers and Majluf (1984) further discussed the firm's capital structure decisions from the agency theory perspective. Many scholars also followed suit and discussed the influence of agency conflicts on capital structure from the corporate governance perspective (Agrawal and Mandelker, 1990; Morellec, 2004).

Previous studies on the influences of a firm's ownership structure on capital structure have made the following observations. There is, for instance, a direct relationship between block-holders' shareholdings and the debt used by a firm (Fosberg, 2004). The relationship between institutional shareholdings and the debt is found by Firth (1995) to be positive, but a negative relationship is

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observed by Chaganti and Damanpour (1991). Mixed results on the relationship between managerial ownership and debt have also been found. Specifically, a positive relationship is documented by Mehran (1992), while a negative relationship is observed by a number of studies, including Friend and Lang (1988), Friend and Hasbrouck (1988) and Al-Fayoumi and Abuzayed (2009). Interestingly, a non-linear inverted U-shaped relationship between managerial ownership and the debt has also been found by some studies (McConnell and Servaes, 1995). Setia-Atmaja et al. (2009) find that there is a positive relationship between family shareholders and the debt ratio.

In terms of the influences of the board of director structure on the capital structure, a dual leadership structure where the director also serves as the CEO is found to be related to an increased debt (Fosberg, 2004). Abor and Biekpe (2006) find that the debt ratio and the size of the board are negatively correlated. In addition, some studies examine the capital structure by analyzing the divergence between cash flow and control rights, and find that the divergence between cash flow and control rights is positively correlated with the debt (Du and Dai, 2005).

In Taiwan, small and medium-sized enterprises (SMEs) that have long been regarded as the cornerstone of Taiwan's economic development were important contributors to the economic miracle of Taiwan. As of 2007, there were a total of 1.237 million SMEs in Taiwan, representing 97.63% of the total number of enterprises. The sales (in value terms) of SMEs amounted to 28.34% of the total sales of all enterprises, reflecting the importance of SMEs in Taiwan's economy and their contribution to Taiwan's economic development. However, due to their small size, their inability to provide sufficient collateral, the lack of transparency in information disclosure and limited financing channels, SMEs often resort to short-term debt instead of long-term debt (Voulgaris et al., 2004). As a result, a lower level of liquidity and financial leverage is observed in SMEs. In addition, SMEs are characterized by highly-concentrated share ownerships, suggesting that their funding sources are different from those of large enterprises (Ang, 1991). In Taiwan, the majority of SMEs are family businesses, and the top management often consists of the same person or of family members. These unique characteristics of SMEs make their capital structures and corporate governance differ from those of large enterprises.

In Taiwan, firms in conventional industries are usually operated by families or enterprise groups. Du and Dai (2005) find that the controlling shareholders tend to increase the firm's liabilities in order to avoid the dilution of control. In other words, there is a preference for using debt financing by controlling shareholders. In addition, Harris and Raviv (1988) suggest that controlling shareholders have entrenchment motives and often borrow more than the optimal debt level in their capital structure in order to expand their personal voting rights and lower the firm's takeover risks. However, controlling shareholders may choose to reduce the firm's financial leverage as a way of covering up their misappropriating behaviour, thus giving rise to the reduces-debt-for-tunneling effect.

The high-tech industry also plays an important role in the stock market. High-tech firms have greater financing choices compared to firms in the conventional industry. As the high-tech firms have a strong demand for professional and technical employees, they often use incentive reward systems such as giving employees' bonus shares or awarding managerial stock options to enhance the employees' productivity and loyalty to the company. Subsequently, a higher level of participation by professional shareholders in a firm's decisions can be observed.

Furthermore, as large firms in general have more robust accounting systems, higher transparency in information disclosure and more stable operations than smaller firms', financial institutions are more willing to lend funds to large firms. Smaller firms, on the other hand, usually have limited financing channels. The participation of block-holders in smaller firms' management decisions can often be observed. Fosberg (2004) suggests that the monitoring by block-holders can effectively control the agency problem resulting from choosing the suboptimal capital structure for the company.

Since previous research mainly focuses on large enterprises or listed companies, this study contributes to the literature by examining SMEs which have unique characteristics and play an important role in the economic development of Taiwan. In addition, the model used in this study includes several corporate governance variables, such as the divergence between earnings, shareholdings and director seats, ownership structures and board of director structures, to provide an integrated analysis of the relationship between internal governance mechanisms and capital structure. Moreover, the agency problems related to debt or equity financing may differ between high-tech and conventional industries, and smaller firms may have different operating styles and governance structures from those of large firms. Accordingly, this study further examines whether the influence of internal governance mechanisms on firm's capital structure decisions will be affected by the differences in industry categories and firm size.

The results show that, when there is a higher divergence between shareholdings and director seats, conventional industries prefer to use long-term debt financing, while the high-tech industries prefer the opposite. For large firms, block-holders and independent directors prefer lower long-term debt financing, but family shareholders and managerial directors prefer lower short-term debt financing. This study also finds that the family shareholding ratio and family directors are the two most important factors that affect the SMEs' debt ratio. The higher the family shareholding ratio is, the more short-term debt financing will be. However, family directors can reduce the incidence of using short-term debt to support long-term financial needs.

The remainder of this paper is organized as follows. Section 2 briefly introduces the characteristics of corporate governance in Taiwan and reviews the literatures. Section 3 describes the data and empirical models. Section 4 analyzes and discusses the empirical results. Section 5 concludes this study.

## **2. Literature Review**

### **2.1 The Characteristics of Corporate Governance in Taiwan**

Taiwanese listed firms are characterized by low institutional ownership, an inactive market for corporate control, and family-controlled companies. The controlling family directly or indirectly exercise control through pyramid structures, crossholdings, and interlocking directory among firms (Yeh et al., 2001; Solomon et al., 2003). Family members generally have a strong leadership and play a dominant role in their decision-making process. Recently, corporate governance system in Taiwan has well matured, and has gradually made a series of improvements. For example, independent directors with competence and integrity are appointed to strengthen the powers of the board of directors; audit and compensation committees are installed to improve information transparency and to avoid agency problem of fat cat. Within Asia, the overall quality of Taiwanese corporate governance regime generally ranks in the top half of various surveys.

### **2.2 Ownership Structure and Capital Structure**

Fama and Jensen (1983) suggest that block-holders are more effective in monitoring the company than small shareholders. Shleifer and Vishny (1986) further propose that external block-holders can limit the scope of managerial opportunism, thereby reducing the costs of conflicts between managers and shareholders. In addition, Brailsford et al. (2002) argue that if external block-holders can actively monitor managers' behaviour, it will be more difficult for managers to adjust the debt ratios to serve their own interests. Moreover, Fosberg (2004) suggests that the monitoring by block-holders can effectively prevent the firm from choosing a suboptimal capital structure, thereby reducing the agency problem.

The information asymmetry in the capital market is the largest impediment faced by companies when raising funds (Myers and Majluf, 1984). Diamond (1984) finds that bank ownership can

enhance monitoring and reduce information asymmetry. Furthermore, banks as creditors can have the certification effect by signaling to the market that the firm will have a stable cash flow, good operating conditions, and low financial crisis risks. In addition, directors designated by the financial institution can provide professional financial or investment advisory services to firms (Schneider, 2000). Therefore, it can be regarded as a sign of a guarantee, allowing the monitoring costs to benefit from economies of scale, reducing entry barriers to the capital market (Fama, 1985), and thereby reducing the firm's capital costs (James, 1987). Hoshi et al. (1990) and Gilson (1990) also find that having a close relationship with a bank can lower the costs of a financial crisis. Chaganti and Damanpour (1991) and Bathala et al. (1994) find that institutional shareholders prefer low debt financing. In addition, Firth (1995) suggests that institutional shareholders can safeguard the rights and interests of shareholders by restricting managerial behaviour.

Friend and Hasbrouck (1988), Firth (1995), Berger et al. (1997) and Al-Fayoumi and Abuzayed (2009) find that managerial shareholdings are negatively related to firm's debt in order to reduce the bankruptcy risk. Fosberg (2004) further finds that the firm's financial leverage is negatively correlated with CEO shareholdings but positively correlated with director shareholdings. McConnell and Servaes (1995) suggest an inverted U-shape relationship between managerial ownership and the debt.

Family shareholders are more concerned about the firm's future growth and survival (Schneider, 2000). Since the interests of the firm are aligned with the interests of the family, the family shareholders have greater incentives to monitor the operations of the family business. Anderson et al. (2003) suggest that family firms have a stronger incentive to improve the firm's operating performance and reduce operating risks. Setia-Atmaja et al. (2009) find that family-controlled firms prefer to use leverage instead of monitoring the independent directors and, therefore, debt is an effective governance mechanism which can reduce the equity agency problem.

When the ownership is concentrated, the interests of controlling shareholders and the firm are aligned. However, if the control rights diverge from the cash flow rights, the agency problem between controlling shareholders and minority shareholders will become more severe and will have a negative impact on firm value (Harris and Raviv, 1988). Du and Dai (2005) and Chong (2010) find that the divergence of shareholders' control rights from cash flow rights will increase the risk-taking in firm's capital structure decisions.

### **2.3 Board of Director Structure and Capital Structure**

The board of directors lies at the center of the firm's internal governance mechanisms and it is also a formal organizational unit in the first line of defense to protect the shareholders' interests from being subutilized by managers (Daily et al., 2003). In addition, the board of directors can help minimize the expectation gap between stakeholders and the board of directors (Brennan, 2006). Therefore, a fully functional board can improve a firm's performance, value and survival (Zahra and Pearce, 1989; Borch and Huse, 1993).

Brennan and McDermott (2004), Matolcsy et al. (2004) and Peasnell et al. (2006) suggest that independent directors can monitor company managers more efficiently, thereby reducing the agency costs arising from the divergence between ownership and control rights. Shivdasani (1993), Brickley et al. (1994) and Yermack (1996) find that the firm's performance (value) and the fraction of outside independent directors on the board are positively correlated.

Daily et al. (1999), Zahra and Pearce (1989) and Young et al. (2001) suggest that the appointment of independent directors on the board and the duality of the CEO/Chairman positions are key factors in improving the effectiveness of the monitoring and service functions of the board. Fosberg (2004) finds that a dual leadership structure will increase the debt used by a firm. Fairchild and Li (2005) find that directors in managerial positions can improve a firm's financial performance.

The previous studies show that a firm's capital structure decisions are influenced by the agency problems that stem from corporate governance issues. Therefore, this study analyzes the relationship between firms' internal corporate governance mechanisms and capital structure in three respects: (1) the divergence between earnings, shareholdings and director seats, (2) ownership structure, and (3) the board of director structure.

### **3. Dataset and Methodology**

#### **3.1 Research Data**

Based on the definition of SME Certification Standards released in July 2005, a firm is regarded as a SME if it is in the manufacturing, construction, mining, or extractive industries and with a staff of less than 200 people. The sample used in this study includes 145 listed and OTC companies (1,160 observations) in Taiwan with less than 200 employees for the period 2000 to 2007. And the sample data are retrieved from the Taiwan Economic Journal database (TEJ).

In order to control for the cross-industry heterogeneity, this study divides observations into conventional and high-tech industries (including electronics and biotech medical industries) based on the classifications used in the TEJ database. In addition, this study controls for the firm size effect by sorting the average total assets over the eight years in ascending order. The observations are then classified into three groups, small (the first 30%), medium (the 40% in the middle) and large (the last 30%), according to the scale of their average total assets. Comparisons between the small firms from the first 30% and the large firms from the last 30% are finally conducted.

#### **3.2 Research Variables**

The empirical variables of this study include variables for capital structure, corporate governance and firm characteristics. For the capital structure variables, we include the debt ratio, long-term debt ratio and short-term debt ratio as SMEs tend to use short-term instead of long-term debt (Voulgaris et al., 2004). In terms of the corporate governance variables, we focus on the impact of the internal governance variables on the capital structure and include the degree of divergence between earnings, shareholdings and director seats (hereinafter referred to as the divergence ratio), ownership structure, and the board of director structure as the testing variables. To take into account the fact that the majority of SMEs in Taiwan are operated by families, this study includes two variables, namely, family shareholding ratio and family director seats, in the model. In addition, the personal financial leverage of the board members and the firm's financial leverage decision may be related and therefore, the pledged shares ratio of directors or supervisors are included in the model to measure the effect of the financial leverage of shareholders (Lee and Yeh, 2004). The firm characteristic variables are also included in the model to control the influences of the firm's profitability, size and industry (Moh'd et al., 1998; Kuo et al., 2000). Table 1 on the next page outlines the measurements of the variables.

#### **3.3 Empirical Model**

Since most Taiwanese listed firms are typically family-owned, the controlling families have a dominant power in the decision-making. In addition, the firm's ownership is more prone to high concentration due to an inactive market for corporate control in Taiwan. The high concentration of ownership has always existed in SMEs. The capital structure inversely affecting corporate governance could be neglected. We adopt a panel data regression model to overcome the heterogeneity effect of individual companies. And a multiple regression model is constructed to examine the effects of corporate governance on capital structure. The empirical model as follow:

$$DR_i = \beta_{0i} + \beta_1 ESDIV_i + \beta_2 EBDIV_i + \beta_3 SBDIV_i + \beta_4 BIGH_i + \beta_5 FINH_i + \beta_6 MANH_i + \beta_7 FAMH_i + \beta_8 PLAG_i + \beta_9 MANBOD_i + \beta_{10} INDBOD_i + \beta_{11} FAMBOD_i + \beta_{12} LNTA_i + \beta_{13} ROA_i + \varepsilon_i \quad (1)$$

Table 1. Operational definitions of variables

Variable	Operational Definition
Capital Structure	Debt Ratio (%) (DR) = (Total debt ÷ total assets) × 100%.
	Long-term Debt Ratio (%) (LDR) = [(Long-term debt + other long-term debt) ÷ total assets] × 100%.
	Short-term Debt Ratio (%) (SDR) = (Short-term debt ÷ total assets) × 100%.
Earnings-shareholding-director seats Divergence Ratio	Earnings-Shareholding Divergence Ratio (%) (ESDIV) = (Earnings distribution rights % ÷ stock control rights%) × 100%, of which the earnings distribution rights are also referred to as cash flow rights, i.e., the direct earnings distribution rights of the ultimate controller + Σ the product of shareholding ratios between each controlling chain, excluding the shareholding of the legal person (foundation) of the family. Stock control rights are also called voting rights, i.e., the direct shareholding ratio of the ultimate controller + the indirect shareholding ratio. This study adopts the methodology of La Porta et al. (1999) and defines the shareholding at the end of the control chain as the indirect shareholding.
	Earnings-Director Seats Divergence Ratio (%) (EBDIV) = (Earnings distribution rights % ÷ director seats control rights %) × 100, of which the earnings distribution rights are also referred to as cash flow rights, i.e., the direct earnings distribution rights of the ultimate controller + Σ the product of shareholding ratios between each controlling chain, excluding the shareholding of the legal person (foundation) of the family. The director seats control right is the director seats controlled by the ultimate controller ÷ total seats on the board of directors.
	Shareholding-Director Seats Divergence Ratio (%) (SBDIV) = (Stock control rights% ÷ director seats control rights%) × 100%, of which the stock control rights are also referred to as voting rights, i.e., the direct shareholding ratio of the ultimate controller + the indirect shareholding ratio. This study adopts the methodology of La Porta et al. (1999), seeing the shareholding at the end of the control chain as its indirect shareholding. The director seats control right is director seats controlled by the ultimate controller ÷ total seats on the board of directors.
Ownership Structure	Block-holder Shareholding Ratio (%) (BIGH) = (total shares of block-holders ÷ total shares issued of the firm) × 100%, of which a block-holder is defined as a shareholder with holdings of more than 10% (not including 10%) of the total shares.
	Financial Institution Shareholding Ratio (%) (FINH) = [(Domestic financial institution investments + overseas financial institution investments ÷ (government (public) institution investments + domestic financial institution investments + domestic securities investments + domestic corporate legal person investments + domestic other legal person investments + overseas financial institution investments + overseas legal person investments + overseas securities investments + domestic natural person investments + overseas natural person investments + treasury stocks)] × 100%, of which domestic financial institution investments include investments from the banking industry, insurance industry, and trusted investments (including personal funds and trusted funds).
	Managerial Shareholding Ratio (Shareholding ratios by managers inside the company or group) (%) (MANH) = (The total shares of all managers at the end of the month ÷ the total shares issued by the firm at the end of the month) × 100%, of which managers are defined as the chief executive officer, executive managers, managers of important departments and associate managers.
	Family Shareholding Ratio (%) (FAMH) = [(Shares held by individuals in the family + shares held by the listed companies of the family + shares held by unlisted companies of the family + shares held by the foundations of the family) ÷ the total shares issued by the company at the end of the month] × 100%.
	Director Pledge Ratio (%) (PLAG) = (Total pledged shares of all the directors ÷ total shares of all the directors) × 100%.
Board of Director Structure	Managerial Director Seats (MANBOD) = Total directors seats held by managers inside the company or group.
	Independent Director Seats (INDBOD) = Total directors seats held by people who are not employed by the company, do not have family relationship with other directors in the company, and have a shareholding ratio of less than 1%.
	Family Director Seats (FAMBOD) = The total director seats of ultimate controllers + the director seats held through unlisted companies + the director seats held through the legal persons (foundation, hospitals, schools).
Firm Characteristics Variables	Return on Assets (%) (ROA) = [(Net income + interest expenses × (1 - 25%)) ÷ total net assets] × 100%.
	Firm Size: This study uses the log of the firm's total assets (Ln(TA)) and the firm size dummy as proxy variables for measuring firm size, of which: (1) Ln(TA)(LNTA) = Natural logarithm of the firm's total assets (2) Firm Size Dummy (SIZED): sorting the samples according to their average total assets during the time period studied in ascending order. Firms in the first 30% (i.e., small firms) = 0 and firms in the last 30% (i.e., large firms) = 1.
	Industry Dummy (INDD): Classifying the industries into the two groups: conventional industry and high-tech industry (where the high-tech industry includes electronics and biotech medical industries). High-tech industry = 1 and conventional industry = 0.

The dependent variable of the empirical model is the capital structure measured by the debt ratio, long-term debt ratio and short-term debt ratio.

The main independent variables are the firm's internal governance mechanism, including the earnings-shareholding-director seats divergence ratio (measured by the earnings-shareholding divergence ratio, earnings-director seats divergence ratio, and shareholding-director seats divergence ratio), ownership structure (measured by the block-holder shareholding ratio, financial institution shareholding ratio, managerial shareholding ratio, family shareholding ratio, and director pledge ratio), and the board of director structure (measured by the managerial director seats, independent director seats and family director seats). The control variables include the firm's profitability (measured by the return on assets), firm size (measured by total assets and the firm size dummy), and industry categories (measured by the industry dummy).

In equation (1), the DR is the firm's capital structure, measured by the debt ratio, long-term debt ratio and short-term debt ratio. Three divergence indicators are measured by the earnings-shareholding divergence ratio (ESDIV), the earnings-director seats divergence ratio (EBDIV) and the shareholding-director seats divergence ratio (SBDIV). Five ownership structure variables are measured by the block-holder shareholding ratio (BIGH), the financial institution shareholding ratio (FINH), the managerial shareholding ratio (MANH), the family shareholding ratio (FAMH), and the director pledge ratio (PLAG). Three board of director structure variables are measured by managerial director seats (MANBOD), independent director seats (INBOD), and family director seats (FAMBOD). In addition, the model also considers the effects of firm's size and profitability on capital structure. The total assets (LNTA) and the return on assets (ROA) are as the proxy of firm's size and profitability, respectively.

In order to further examine the effects of firm size and industry on capital structure, we include four interaction variables, including the industry dummy (INDD)  $\times$  corporate governance variables, industry dummy (INDD)  $\times$  company financial variables, firm size dummy (SIZED)  $\times$  corporate governance variables, and firm size dummy (SIZED)  $\times$  company financial variables. Since the industry and firm size dummy variables are constant variables that do not change throughout the sample period, to avoid the collinearity problem we employ the random-effects model for these tests.

## 4. Empirical Findings and Discussions

### 4.1 Descriptive Statistics Analysis

The descriptive statistics of the variables are presented in Table 2 on the next page. In terms of the financial variables, the conventional industry and large firms have higher debt ratios, short-term debt ratios and total assets, while the return on assets of the conventional industry is lower than that of the high-tech industry. As regards the corporate governance, large firms have higher earnings-shareholding-director seats divergence ratios than small firms. In terms of the ownership structure, the high-tech industry has a lower block-holder shareholding ratio while the conventional industry and large firms have higher ratios for the financial institution shareholding, family shareholding and director pledge ratios, and lower ratios for the managerial shareholding ratio. As for of the board of director structure, the high-tech industry and small firms have more seats held by managerial directors and independent directors, while the conventional industry and large firms have more seats held by family directors.

### 4.2 Panel Data Regression Analysis

Before proceeding to the panel data regression analysis, we first examine the correlation and collinearity among the corporate governance variables using the Pearson correlation coefficient and variance inflation factor (VIF). The results show that there are high collinearity and correlation coefficients between the earnings-director seats divergence ratio and shareholding-director seats divergence ratio. The VIF of the earnings-director seats divergence ratio is also greater than that of the other two divergence ratios. Therefore, only the earnings-shareholding divergence ratio and shareholding-director seats divergence ratio are included in the panel data regression model.

#### 4.2.1 Analysis of the whole samples

The results of the whole samples are shown in Table 3 on the next two pages. It indicates that the earnings-shareholding divergence ratio is significantly correlated with the debt ratio and long-term debt ratio, indicating that the higher deviation between earnings and shareholdings (i.e., the lower earnings-shareholding ratio), the less the debt financing. In other words, the equity agency problems will become more severe when there is a higher deviation between the cash flow rights and voting rights of the ultimate controlling shareholder. The controlling shareholder has a greater

incentive to expropriate the firm's assets because what he can gain by exercising his control rights far exceeds his losses. Based on the reduce-debt-for-tunnelling effect, when a firm increases its debt, it must use more earnings to pay the debt, thereby limiting the opportunistic behaviour of the controlling shareholder. Therefore, the ultimate controlling shareholder will decrease the debt and lower the financial leverage ratio.

**Table 2.** Descriptive statistics of variables

Variables	Whole samples	Industry differences			Firm size differences		
		Conventional industry	High-tech industry	T-test	Small-size	Large-size	T-test
Debt Ratio	44.81 <sup>a</sup> (22.35)	47.58	38.67	7.51***	39.82	46.84	-3.97***
Long-term Debt Ratio	10.62 (10.97)	11.55	8.54	4.97***	10.57	9.31	1.53
Short-term Debt Ratio	33.98 (21.51)	35.71	30.13	4.77***	29.25	36.80	-4.57***
Earnings-Shareholding Divergence Ratio	85.33 (23.42)	86.70	82.29	2.84***	88.84	85.50	1.98**
Earnings-Director Seats Divergence Ratio	44.78 (37.16)	43.15	48.41	-1.85*	56.14	39.80	5.24***
Shareholding-Director Seats Divergence Ratio	52.11 (37.82)	49.78	57.28	-2.59***	62.33	46.90	4.81***
Block-holder Shareholding Ratio	18.91 (13.51)	19.87	16.78	3.98***	19.36	17.87	1.55
Financial Institution Shareholding Ratio	1.29 (4.76)	1.42	0.98	1.80*	0.37	2.23	-4.81***
Managerial Shareholding Ratio	1.33 (2.28)	1.01	2.05	-7.07***	1.71	0.75	6.27***
Family Shareholding Ratio	30.46 (17.99)	32.50	25.92	6.38***	29.53	32.44	-2.05**
Director Pledge Ratio	11.53 (22.22)	14.49	4.95	8.50***	4.48	15.00	-7.00***
Managerial Director Seats	0.71 (1.01)	0.60	0.94	-5.28***	0.71	0.52	2.87***
Independent Directors Seats	0.28 (0.70)	0.17	0.54	-7.42***	0.43	0.12	6.29***
Family Director Seats	3.76 (2.03)	4.23	2.72	15.46***	3.05	4.58	-9.68***
Total Assets (Million N.T.)	4587 (6254)	5581	2379	11.63***	1061	10671	-20.45***
Return on Assets	1.61 (11.32)	0.53	4.00	-4.69***	1.84	1.94	-0.13

**Notes:** The whole sample includes all 145 small and medium-sized enterprises from the year 2000 to 2007. The sample divided into conventional and high-tech industries according to the TEJ categorization (where the high-tech industry includes the electronics and bio-tech medicine industries), The samples are sorted based on their average total assets during the period studied in ascending order. The firms are then divided into small (first 30%), medium-sized (middle 40%), and large (last 30%) firms. "a" indicates the mean. The standard deviations are in parentheses under the mean. Asterisks \*\*\*, \*\*, and \* indicate significant at 1%, 5%, and 10% levels, respectively.

Accordingly, the earnings-shareholding divergence ratio is positively correlated with the financial leverage ratio this contradicts with the findings of Harris and Raviv (1988) and Du and Dai (2005). Moreover, the managerial shareholding ratio and family shareholding ratio are positively related to the debt ratio, indicating that managers and family shareholders prefer to use debt financing to acquire agency-related benefits. This result does not support the findings of Friend and Hasbrouck (1988) and Firth (1995). Furthermore, the results also show that the three director seat variables are negatively related to the debt ratio and short-term debt ratio. This indicates that in order to ensure their job security, managers prefer lower debt financing the same with Fosberg's (2004) findings. In addition, this study finds that independent directors incline to decrease the firm's

debt in accordance with the findings of Brennan and McDermott (2004), Matolcsy et al. (2004), and Peasnell et al. (2006). Moreover, family directors of SMEs prefer to use less debt financing and can therefore decrease the firm's bankruptcy risk.

**Table 3.** Panel data regression results of all samples

Variables	Debt Ratio	Long-term Debt Ratio	Short-term Debt Ratio
Earnings-shareholding Divergence Ratio	0.1957*** (3.815)	0.1286 *** (3.674)	0.0838 (1.609)
Shareholding-director seats Divergence Ratio	-0.0063 (-0.253)	-0.0172 (-1.004)	0.0052 (0.203)
Block-holder Shareholding	-0.0568 (-1.308)	-0.0262 (-0.883)	0.0143 (0.325)
Financial Institution Shareholding	0.0140 (0.105)	0.0824 (0.909)	-0.1982 (-1.472)
Managerial Shareholding	0.7742** (2.304)	0.4828** (2.106)	0.2667 (0.782)
Family Shareholding	0.1216** (2.089)	0.0440 (1.107)	0.0382 (0.647)
Director Pledge Ratio	-0.0248 (-0.936)	-0.0217 (-1.204)	0.0085 (0.318)
Managerial Director Seats	-3.0948*** (-3.766)	-0.6172 (-1.101)	-2.4534*** (-2.942)
Independent Director Seats	-0.9560 (-1.233)	0.9604* (1.815)	-1.8874** (-2.398)
Family Director Seats	-1.4132*** (-3.416)	-0.1068 (-0.378)	-1.2992*** (-3.094)
Assets Scale (LnTA)	5.5174** (4.921)	0.2877 (0.376)	4.4670** (3.926)
Return on Assets	-0.6131*** (-14.833)	-0.2416*** (-8.569)	-0.3649*** (-8.699)
F-test (p-value)	22.30 (0.0000)	8.44 (0.0000)	19.42 (0.0000)
LM-test (p-value)	1562.21 (0.0000)	667.16 (0.0000)	1670.46 (0.0000)
Hausman test (p-value)	37.91 (0.0002)	31.45 (0.0017)	23.52 (0.0237)
Adj- R <sup>2</sup>	0.7414	0.5005	0.7126

**Note:** The t statistics are in parentheses under coefficients. Asterisks \*\*\*, \*\*, and \* indicate significant at 1%, 5%, and 10% levels, respectively.

#### 4.2.2 Analysis of industry differences

The results of the differential effect of corporate governance on capital structure between the conventional industry and the high-tech industry are presented in Table 4 on the next page. The results of interaction variables show that the effect of the earnings-shareholding divergence ratio on the debt ratio is higher in the high-tech industry than in the conventional industries. In addition, we find that when the degree of deviation between shareholdings and director seats is high, the conventional industries will tend to use more long-term debt and less short-term debt, while the high-tech industry will tend to use more short-term debt and less long-term debt. Moreover, in the high-tech industry, the higher the block-holder shareholding ratio is, the higher the debt ratio will be. This supports the views of Brailsford et al. (2002) that block-holders are active monitors. In the high-tech industry, the managerial shareholders can obtain agency-related benefits by increasing debt financing, especially through the use of short-term debt. Furthermore, family shareholders in the conventional industry have less incentive to increase short-term debt. By contrast, family shareholders in the high-tech industry are more likely to do so. Finally, the results show that there is no significant difference between the conventional industry and the high-tech industry in terms of the effect of the board of director structure variables on the firm's financial leverage.

Table 4. Panel data regression analysis results of industry differences

Variables	Debt Ratio	Long-term Debt Ratio	Short-term Debt Ratio
Intercept	-16.2138 (-0.984)	30.1793*** (3.180)	-34.2338** (-2.021)
Earnings-shareholding Divergence Ratio	0.0847* (1.731)	0.0623** (2.214)	0.0103 (0.205)
Shareholding-director seats Divergence Ratio	0.0793* (1.794)	-0.0688** (-2.441)	0.1218*** (2.678)
Block-holder Shareholding	-0.0600 (-1.229)	-0.0208 (-0.653)	0.0238 (0.473)
Financial Institution Shareholding	0.1956 (1.402)	0.1023 (1.164)	-0.1383 (-0.964)
Managerial Shareholding	-0.1951 (-0.522)	0.1541 (0.648)	-0.5539 (-1.440)
Family Shareholding	-0.0516 (-0.683)	0.0526 (1.102)	-0.1434* (-1.844)
Director Pledge Ratio	0.0068 (0.250)	0.0096 (0.549)	0.0204 (0.731)
Managerial Director Seats	-1.7009* (-1.873)	-0.2646 (-0.476)	-1.0204 (-1.092)
Independent Director Seats	0.2935 (0.279)	1.3113* (1.901)	-1.4384 (-1.331)
Family Director Seats	-1.4551*** (-3.572)	-0.2800 (-1.107)	-1.1816 *** (-2.820)
Assets Scale (LnTA)	4.1903*** (3.997)	-1.4071** (-2.318)	4.9264*** (4.570)
Return on Assets	-0.7843*** (-16.188)	-0.2730*** (-8.423)	-0.5054 *** (-10.141)
Industry Dummy	-82.5088** (-2.510)	-85.3790*** (-4.325)	12.5581 (0.372)
Industry Differences × Earnings-shareholding Divergence Ratio	0.1621* (1.930)	0.0278 (0.583)	0.1253 (1.451)
Industry Differences × Shareholding-director seats Divergence Ratio	-0.1141** (-2.182)	0.0818** (2.441)	-0.1651** (-3.067)
Industry Differences × Block-holder Shareholding	0.1847* (1.935)	0.0059 (0.094)	0.1022 (1.041)
Industry Differences × Financial Institution Shareholding	-0.5150* (-1.779)	0.0224 (0.117)	-0.2572 (-0.864)
Industry Differences × Managerial Shareholding	1.5412** (2.432)	-0.1240 (-0.304)	1.7219*** (2.642)
Industry Differences × Family Shareholding	0.1852 (1.526)	-0.0268 (-0.348)	0.2269* (1.817)
Industry Differences × Director Pledge Ratio	-0.0118 (-0.176)	-0.0269 (-0.605)	0.0092 (0.134)
Industry Differences × Managerial Director Seats	-0.2331 (-0.148)	0.1580 (0.159)	-0.7627 (-0.472)
Industry Differences × Independent Director Seats	-1.1685 (-0.787)	-1.3784 (-1.423)	0.7131 (0.467)
Industry Differences × Family Director Seats	1.1372 (1.023)	0.4622 (0.646)	0.5425 (0.475)
Industry Differences × Assets scale (LnTA)	3.8066* (1.782)	5.2281*** (4.041)	-2.0713 (-0.943)
Industry Differences × Return on Assets	0.4770*** (5.560)	0.1560*** (2.738)	0.3219*** (3.647)
LM-test (p-value)	1361.40 (0.0000)	601.93 (0.0000)	1419.58 (0.0000)
Adj- R <sup>2</sup>	0.7528	0.5160	0.7177

**Note:** The t statistics are in parentheses under coefficients. Asterisks \*\*\*, \*\*, and \* indicate significant at 1%, 5%, and 10% levels, respectively.

### 4.2.3 Analysis of firm size differences

The results of the differential effect of corporate governance on capital structure between the small firms and large firms are presented in Table 5.

**Table 5.** Panel data regression analysis results of firm size differences

Variables	Debt Ratio	Long-term Debt Ratio	Short-term Debt Ratio
Intercept	38.1644 (1.213)	4.9374 (0.240)	44.4606 (1.395)
Earnings-shareholding Divergence Ratio	0.1914*** (2.912)	0.1389*** (3.253)	0.0410 (0.615)
Shareholding-director seats Divergence Ratio	-0.0350 (-1.332)	-0.0125 (-0.724)	-0.0200 (-0.751)
Block-holder Shareholding	0.1088 (1.471)	0.0485 (0.958)	0.0699 (0.930)
Financial Institution Shareholding	-0.2984 (-0.716)	0.4954* (1.679)	-0.6772 (-1.597)
Managerial Shareholding	1.4336*** (3.018)	0.5049 (1.550)	0.8445* (1.749)
Family Shareholding	0.0758 (0.873)	0.0036 (0.065)	0.0515 (0.585)
Director Pledge Ratio	-0.0311 (-0.527)	0.0354 (0.871)	-0.0483 (-0.805)
Managerial Director Seats	-4.2938*** (-3.301)	-1.2243 (-1.429)	-2.5175* (-1.909)
Independent Director Seats	0.6616 (0.582)	0.8371 (1.092)	-0.2700 (-0.234)
Family Director Seats	-0.9745 (-1.198)	-0.6919 (-1.336)	-0.5328 (-0.648)
Assets Scale (LnTA)	-0.9003 (-0.423)	-0.3473 (-0.246)	-1.2426 (-0.576)
Return on Assets	-0.8508*** (-14.702)	-0.4178*** (-10.480)	-0.4298*** (-7.306)
Firm Size Dummy	-116.3851*** (-2.767)	5.4075 (0.199)	-117.3018*** (-2.755)
Firm Size × Earnings-shareholding Divergence Ratio	-0.1020 (-0.958)	-0.0934 (-1.570)	-0.0105 (-0.098)
Firm Size × Shareholding-director seats Divergence Ratio	0.4267*** (5.398)	-0.0953* (-1.945)	0.4493*** (5.626)
Firm Size × Block-holder Shareholding	-0.2718** (-2.493)	-0.1018 (-1.394)	-0.0385 (-0.348)
Firm Size × Financial Institution Shareholding	0.2157 (0.444)	-0.3737 (-1.154)	-0.1485 (-0.302)
Firm Size × Managerial Shareholding	-1.9451* (-1.778)	-0.8733 (-1.269)	-0.9843 (-0.890)
Firm Size × Family Shareholding	-0.6083*** (-4.008)	0.0747 (0.794)	-0.6997*** (-4.564)
Firm Size × Director Pledge Ratio	-0.0393 (-0.571)	-0.0407 (-0.862)	0.0175 (0.250)
Firm Size × Managerial Director Seats	1.3108 (0.690)	2.6840** (2.201)	-2.6519 (-1.379)
Firm Size × Independent Director Seats	-0.7963 (-0.395)	-2.2775* (-1.647)	1.5253 (0.745)
Firm Size × Family Director Seats	-0.3608 (-0.354)	0.9229 (1.456)	-1.5281 (-1.485)
Firm Size × Assets scale (LnTA)	9.0229*** (3.289)	0.1651 (0.091)	8.9307*** (3.211)
Firm Size × Return on Assets	0.4075*** (3.656)	0.3570*** (4.738)	0.0511 (0.451)
LM-test (p-value)	895.11 (0.0000)	268.15 (0.0000)	843.34 (0.0000)
Adj-R <sup>2</sup>	0.8000	0.5129	0.7642

**Note:** The t statistics are in parentheses under coefficients. Asterisks \*\*\*, \*\*, and \* indicate significant at 1%, 5%, and 10%, respectively.

The results of interaction variables show that the divergence ratio is positively correlated with large firms' total debt. We also find that when the shareholding-director seats divergence is high, large firms tend to use more long-term debt and less short-term debt. Block-holders of large firms prefer low debt financing and do not exhibit the behaviour of expropriating minority shareholders. Moreover, the managerial shareholders of small firms prefer to increase debt financing while the managerial shareholders of large firms are more likely to decrease debt financing. Furthermore, the family shareholders of large firms will not try to obtain agency-related benefits by increasing total debt or short-term debt. Furthermore, managerial directors of small firms have a tendency to decrease the long-term debt ratio. By contrast, managerial directors of large firms will tend to decrease short-term debt. The independent directors of large firms have the tendency to decrease the firm's long-term debt. While family directors of large firms incline to reduce the short-term debt ratio.

### 4.3 Further Tests and Analysis

In considering the accuracy and completeness of the source data, this study takes listed and OTC SMEs with less than 200 employees as the sample. However, as most of the SMEs have a low level of capital, they are not listed or traded in the OTC market. These firms also have limited financing channels and generally use short-term debt instead of long-term debt. Of the 145 listed and OTC SMEs selected in this study, 76 of the firms have fixed assets to long-term debt ratios that exceed 100% between the year 2004 and 2007, indicating that the long-term debt of SMEs are insufficient to support the funding requirement for the fixed assets. Therefore, they are likely to use short-term debt instead of long-term debt to fill the gap in funding requirements. Accordingly, this study conducts a further test by focusing on these 76 firms that have fixed assets to debt ratios greater than 100% from 2004 to 2007, and examines whether these firms will use short-term debt to support long-term funding requirements. The results are shown in Table 6.

The analysis of the effect of ownership structures in Table 6 shows that the block-holder shareholding ratio is significantly negatively correlated with the long-term debt ratio, indicating that firms with higher block-holder shareholding ratios will reduce their long-term debt. This is contrary to the empirical results of Brailsford et al. (2002) and does not support the hypothesis of active monitoring. That is, in SMEs, block-holders do not actively monitor the behaviour of the management. Therefore, the managerial shareholders may attempt to obtain benefits for themselves by adjusting the long-term debt ratio. The family shareholding ratio is significantly correlated with the short-term debt ratio, which is different from the results in Table 3. This result shows that family shareholders in SMEs tend to borrow more short-term debt. The director pledge ratio is significantly positively correlated with long-term debt while significantly negatively correlated with the short-term debt ratio. This result suggests that the personal financial leverage of the directors may induce them to use long-term debt (instead of short-term debt) to hollow out the firm's assets.

In terms of the board of director structure, the result shows that family director seats are significantly positively correlated with the long-term debt ratio while significantly negatively correlated with the short-term debt ratio. The results suggest that family directors can act as monitors of the management and reduce equity agency problems. Therefore, the short-term debt ratio will be lowered, thereby reducing the chances of using short-term debt to support long-term financial needs.

In sum, this study finds that in most family-owned SMEs, the family shareholding ratio and family directors are important factors influencing the firm's debt ratio. To be specific, a higher family shareholding ratio is associated with greater borrowing of short-term debt. However, family directors will avoid using short-term debt to satisfy the long-term financial requirements in capital management.

**Table 6.** Panel data regression analysis results for firms with fixed assets to long-term debt ratios greater than 100%

Variables	Long-term Debt Ratio	Short-term Debt Ratio
Intercept	19.6610* (1.814)	—
Earnings-shareholding Divergence Ratio	0.0290 (1.006)	0.0254 (0.379)
Shareholding-director seats Divergence Ratio	-0.0031 (-0.230)	-0.0303 (-1.306)
Block-holder Shareholding	-0.0969*** (-3.243)	-0.0259 (-0.523)
Financial Institution Shareholding	0.0242 (0.301)	0.0102 (0.079)
Managerial Shareholding	-0.0146 (-0.067)	-0.0137 (-0.033)
Family Shareholding	0.0194 (0.549)	0.1372** (2.159)
Director Pledge Ratio	0.0669*** (3.405)	-0.1318*** (-3.874)
Managerial Director Seats	0.7846 (1.519)	-1.1189 (-1.207)
Independent Director Seats	0.3150 (0.581)	-0.4223 (-0.471)
Family Director Seats	0.7015*** (2.706)	-1.6857*** (-3.673)
Asset Scale (LnTA)	-1.0077 (-1.458)	11.3305*** (7.660)
Return on Assets	-0.1675*** (-4.305)	-0.1119* (-1.726)
F-test (p-value)	14.17 (0.0000)	31.06 (0.0000)
LM-test (p-value)	703.80 (0.0000)	1097.92 (0.0000)
Hausman test (p-value)	13.20 (0.3544)	19.33 (0.0808)
Adj-R <sup>2</sup>	0.6537	0.8116

**Notes:** The sample consists of 76 firms with fixed assets divided by long-term debt ratios greater than 1 during the 2004 to 2007 period.. “—” indicates the omitted intercept in fixed effect regression model. The t statistics are in parentheses under coefficients. Asterisks \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% levels, respectively.

## 5. Conclusion

Although the issues related to capital structure have been examined for over fifty years, they are still widely discussed in financial studies. Apart from examining the financial determinants of capital structure, more scholars have attempted to explain the capital structure decisions from the agency problem perspective in relation to corporate governance. As SMEs are mostly operated as family businesses, with the top manager being the owner or a person related to the owner’s family, the influence of corporate governance and subsequently the debt and equity agency problems in relation to the capital structure decisions of SMEs may be different from those of large enterprises. Hence, the sample used in this study includes 145 SMEs that were either listed or OTC firms in Taiwan from 2000 to 2007. To test the influences of corporate governance on capital structure, and compare the differences between the conventional and high-tech industries, and the differences between small and large firms.

The results show that the higher the divergence among cash flow rights, voting rights and director seats, the lower the debt ratio. When the shareholdings diverge from the director seats, conventional industries prefer to use long-term debt financing, while the opposite results are found

for the high-tech industries. For large firms, block-holders and independent directors prefer lower long-term debt financing, but family shareholders and managerial directors prefer lower short-term debt financing. This study also finds that family shareholding ratio and family directors are the two most important factors that affect the SMEs' debt ratio. The higher the family shareholding ratio is, the more short-term debt financing will be. However, family directors can reduce the incidence of using short-term debt to support long-term financial needs.

Future research could include other director characteristic variables, such as the education and experience of the directors and their social and economic status to test their effects on the firm's capital structure.

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