CHAPTER 6

CAPITAL STRUCTURE AND FIRM PERFORMANCE

In this chapter, we would like to investigate the effects of capital structure decisions on firm performance. Due to the agency costs of free cash flow problem suggested by Jensen (1986), leverage may increase value of firm because of the reduction in free cash flow that managers can invest in the poor projects or expropriate. Furthermore, the monitoring by creditors from the use of debt can also alleviate the agency problems between managers and shareholders. On the other hand, at the high level of debt, managers may have incentives to shift risk from the shareholders to the creditors by investing in the risky projects that may not be profitable on average. These arguments are usually applied toward listed firms. Therefore, it is interesting to investigate the relation between leverage and performance among Thai firms.

Since the agency costs of equity among non-listed firms may not be as high as among listed firms, we cast doubt whether there is different effect from capital structure toward firm performance between listed and non-listed firms. On the other hand, the costs of capital from private borrowing may be larger than those from public funds, non-listed firms that follow the aggressive capital structure may have lower profitability due to the high costs of capital as suggested in Chapter 2. Furthermore, the aggressive capital structure may indicate the lack of free cash flow especially among non-listed firms. The use of aggressive capital structure will reduce firm profitability among non-listed firms relative to listed firms. Therefore, it is interesting to investigate the relation between leverage and performance among listed and non-listed Thai firms.

In order to investigate whether financing decisions affect firm's performance differently or similarly among SET listed firms and non-listed matched firms, the ordinary least square regression will be proposed with the dependent variable to be firm's performance and the independent variables to be the capital structure measured as total debt to total capital ratio and other controlled variables.

The usual firm performance proxies are Tobin's Q and return on assets (ROA). There is no consensus for the accurate proxy for firm performance. Mehran (1995) argued that the use of Tobin's Q may proxy for the firm's growth opportunity rather than its performance. On the other hand, the use of ROA and other accounting rates of return may convey little information about economic rates of return. However, there was also supporting arguments for using ROA. The accounting returns may provide information to the board about the value added to the firm by the CEO. Therefore, executives had incentives to make major corporate decisions in such a way as to affect ROA and, thus, their compensation. Furthermore, Spivey and McMillan (2000) showed the statistically significant positive correlations between shareholder return and return on assets. Since there is no market value measurement among non-listed firms, firm's performance will be measured as return on asset (ROA) in this study. We also use the basic earnings power as a proxy for firm performance to examine the effects from capital structure toward operating performance by excluding the effect from interest deductions.

Since there may be endogeneity problem between profitability and capital structure, we use the lagged leverage ratio as the independent variable. We use two interaction variables to examine whether there is different effect from leverage toward firm performance between listed and non-listed firms. The first is the dummy variable equals to firm's leverage ratio if it is listed on the SET and zero otherwise

(Leverage,L). The other is the dummy variable equals to firm's leverage ratio if it is not listed on the SET and zero otherwise (Leverage,NL).

We have to control for other factors influencing firm performance as well. Ownership will have to be controlled for the agency problems as suggested by Morck, Shleifer and Vishny (1988), Mehran (1995), McConnell and Servaes (1995), Agrawal and Knoeber (1996), Joh (2003) and Anderson and Reeb (2003). Managerial ownership should be positively related to firm's performance; however, the relationship may not be linear. Therefore, we follow Morck, Shleifer and Vishny (1988) by running the piecewise regression as shown in equation (8). Furthermore, the alternative approach for robustness test to capture the nonlinear relationship is to include both ownership and the square of ownership as the explanatory variables.

The other explanatory variable has to control for the growth opportunities suggested by Morck, Shleifer and Vishny (1988), Mehran (1995), McConnell and Servaes (1995), Chung and Jo (1996), Agrawal and Knoeber (1996), Gedajlovic and Shapiro (2001), Joh (2003) and Anderson and Reeb (2003). Since we do not have information for research and development expenses and advertising expenses, we use percentage change of total assets as a proxy for growth opportunities as suggested by Titman and Wessels (1988).

Size is always used as the controlled variables for the performance investigation, however, the empirical results are mixed. Mehran (1995), Chung and Jo (1996), Agrawal and Knoeber (1996) and Gedajlovic and Shapiro (2001) found a negative relationship between size and firm's performance contradictory to the findings by Joh (2003) and Anderson and Reeb (2003). In addition, Morck, Shleifer and Vishny (1988) and Mehran (1995) found no statistical relationship. In this study, we use the natural log of total assets as size proxy.

In addition, the proxy for the portion of the firm's value in assets in place needs to be controlled as suggested by Mehran (1995). We use the ratio between plant, property and equipment to total assets ratio (TAN) to proxy for assets in place. Firms with high level of fixed assets will have high collateral, which may decrease the borrowing costs. Business risk is also included as a control variable as suggested by Mehran (1995). Business risk (Risk) is measured by the standard deviation of the percentage of change in operating income over 1997 to 2001. Capital expenditures divided by total assets will also be controlled as suggested by Klein (1998). Furthermore, the industry effect will be controlled as well. The model used in the investigation is as followings:

$$\begin{aligned}\text{Performance} = \alpha_0 \; & + \alpha_1 \text{Leverage,L} + \alpha_2 \text{Leverage,NL} \\ & + \alpha_3 \text{Own.0to5} + \alpha_4 \text{Own.5to25} + \alpha_5 \text{Own.OVER25} \\ & + \alpha_6 \text{GTA} + \alpha_7 \text{LnTA} + \alpha_8 (\text{CAPEX/TA}) + \alpha_9 \text{TAN} + \alpha_{10} \text{Risk} \\ & + \beta \text{Industry dummy} + \varepsilon \qquad (8)\end{aligned}$$

Table 11 investigates whether financing decisions affect firm's performance differently or similarly among SET listed firms and non-listed matched firms. Firm performance is studied through basic earnings power (BEP) and return on assets (ROA). The use of the additional percentage increase in leverage is found to decrease all performance measures among Thai firms both listed and non-listed. The negative relationship between leverage and firm performance is consistent with the findings by Mehran (1995), Agrawal and Knoeber (1996), Anderson and Reeb (2003) and Joh (2003). One percentage increase in total debt to total capital among listed firms in the before-matched sample is found to decrease firm's performance 0.053% and 0.067% as measured by the basic earnings power and return on assets respectively. One

percentage increase in total debt to total capital among non-listed firms is found to decrease firm's performance as little as 0.001% and 0.024% as measured by the basic earnings power and return on assets respectively. However, the relationship is not statistically significant between basic earnings power and leverage among non-listed firms. The negative effect from leverage toward performance is more severe among listed firms relative to non-listed firms.

Results do not differ for the matched sample. One percentage increase in total debt to total capital among listed firms in the before-matched sample is found to decrease firm's performance 0.108% and 0.124% as measured by the basic earnings power and return on assets respectively. These negative relationships are statistically significant at 1%. One percentage increase in total debt to total capital among non-listed matched firms is found to decrease firm's performance 0.029% and 0.053% as measured by the basic earnings power and return on assets respectively. However, the relationship is not statistically significant between basic earnings power and leverage among non-listed firms. Since return on assets is calculated as the net income (after deducting interest), the statistically negative relation between return on assets and leverage among non-listed matched firms is resulted from the interest deduction not from the lower operating performance. Therefore, there is little role of debt in alleviating conflicts of interest between manager and shareholders among Thai firms. On the other hand, the use of higher leverage will induce the asset substitution problem among Thai firms especially among listed Thai firms.

The significant decrease in firm performance from the additional percentage of leverage may reflect that Thai firms are borrowing too aggressively. However, the other side of the coin may be that the sample under consideration is in 2001, which is the downturn of Thai economy. The high use of leverage will boost performance

during the economic growth but will destroy performance during the economic downturn.

The results of firm performance and other controlled variables show that firms that have higher capital expenditures, lower assets tangibility and lower risk will have greater profitability. However, there is no relationship between profitability and managerial ownership, growth opportunities and size among the after-matched sample. Results do not change when we use managerial ownership together with the square of managerial ownership instead of the piecewise regression.

Table 11: Regression Results between Firm Performance and Leverage

This table shows the regression results between firm performance and leverage in 2001.The dependent variable is the firms' profitability ratio. The second and third columns measure firm profitability as the basic earning power calculated as the earnings before interest and tax to total assets and the return on assets calculated as the net income to total assets respectively. The independent variables include the interaction term between leverage and listed firms dummy (Leverage,L) and non-listed firms (Leverage,NL) dummy. GTA is the percentage change in total assets. LnTA is the natural logarithm of total assets. CAPEX/TA is the capital expenditures to total assets ratio. *T*-statistics are in parentheses. TAN is the ratio between property, plant and equipment to total assets ratio. Risk is the standard deviation of operating income standardized by total assets over 1997 to 2001. *, ** and *** significant at the 10, 5 and 1 percent level, respectively. The regression equation is as followings:

$$\begin{aligned}\text{Performance} = \alpha_0 &+ \alpha_1\text{Leverage,L} + \alpha_2\text{Leverage,NL}\\ &+ \alpha_3\text{Own.0to5} + \alpha_4\text{Own.5to25} + \alpha_5\text{Own.OVER25}\\ &+ \alpha_6(\text{GTA}) + \alpha_7\text{LnTA} + \alpha_8(\text{CAPEX/TA}) + \alpha_9\text{TAN} + \alpha_{10}\text{Risk}\\ &+ \beta\text{Industry dummy} + \varepsilon \qquad (8)\end{aligned}$$

	Before the matching criteria		After the matching criteria	
Dependent Variable	Basic Earning Power	Return on Assets	Basic Earning Power	Return on Assets
Leverage, Listed firms	-0.053	-0.067**	-0.108***	-0.124***
	(-1.44)	(-1.92)	(-4.52)	(-6.01)
Leverage, Non-listed firms	-0.001	-0.024	-0.029	-0.053***
	(-0.04)	(-1.25)	(-1.36)	(-2.95)
Own.0to5	-0.005	-0.007*	0.001	0.001
	(-1.22)	(-1.64)	(0.30)	(0.51)
Own.5to25	0.002	0.002	0.001	0.001
	(1.18)	(1.03)	(1.11)	(1.18)
Own.OVER25	-0.000	-0.000	-0.000	-0.000
	(-0.89)	(-0.79)	(-0.22)	(-0.24)
GTA	0.002	0.004	0.013	0.020
	(0.32)	(0.51)	(0.61)	(1.10)
LnTA	0.019***	0.015***	0.005	0.003
	(3.87)	(3.32)	(1.03)	(0.83)
CAPEX/TA	-0.043	0.001	0.142**	0.116**
	(-0.92)	(0.02)	(2.37)	(2.25)
TAN	-0.064***	-0.060***	-0.038*	-0.042**
	(-2.67)	(-2.71)	(-1.80)	(-2.34)
Risk	-1.248***	-1.262***	-0.296***	-0.248***
	(-26.84)	(-29.07)	(-3.90)	(-3.79)
F-statistics	45.59***	52.72***	4.66***	6.25***
Adjusted R^2	0.450	0.487	0.138	0.186