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Determinants of Capital Structure of Small Firms in Thailand

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ABSTRACT

Small firms have been recognized as important to the national economy of Thailand. However, owners of Thai small firms have difficulty accessing capital for future development. If a firm has a suitable proportion of debt and equity, it will obtain the lowest-cost financing. This action can increase the owner's value. This raises a question as to what factors influence the capital structure of small firms in Thailand. This study investigates the determinants of the capital structure of small firms in Thailand, using as a sample 191 small enterprises for which the required data was available from 2007 through 2010. Through multiple regression analysis, it was found that small firms employ mostly short-term debt to finance their operations. Results demonstrate that growth and firm age are positively related to short-term debt, whereas, profitability is negatively related. Furthermore, asset structure and age are positively linked to long-term debt, but profitability and size are negatively linked.

Key words: SME, capital structure, small firms

INTRODUCTION

Small and Medium-sized Enterprises (SMEs) are a major strength in the Thai economy, especially small enterprises, which constitute a high proportion of all businesses at 99.6% and which account for 66.6% of the total employment in the country (Office of Small and Medium Enterprises Promotion, 2013). However, owners of Thai small firms face problems of access to capital for future expansion because they have no detailed and reliable financial statements and no collateral assets to secure a loan. Therefore, with no collateralized assets, small firms confront financing challenges and tend to rely on personal and family financing as well as trade credits.

Financing used in the operation of a business determines its capital structure, which refers to the proportion of capital that comes from loans and equity that the companies acquire (Abor and Biekpe, 2009). Capital structure plays an important role in determining the success of any business (Madan, 2007) because it affects the cost of capital (Dogra and Gupta, 2009; Karadeniz *et al.*, 2009). If a firm has a proportion of debt and equity that is suitable, then it will obtain the lowest cost financing, which can increase shareholder value (Abor and Biekpe, 2009; Sheel, 1994). Therefore, the choice of capital structure is one of the most important management decisions.

Although, numerous researchers have investigated the determinants of capital structures, they primarily have used large firms as case studies (Bennett and Donnelly, 1993; Mazur, 2007; Parlak, 2010; Titman and Wessels, 1988). Until recently, only a few studies had focused on small firms (Abor and Biekpe, 2009; Mac an Bhaird and Lucey, 2010; Hall *et al.*, 2004; Nguyen and Ramachandran, 2006; Zhang, 2010). However, most previous studies were focused on Western data. Very rare research has been conducted in Asian countries, including Thailand. Given the importance of this research and the research gap mentioned above, this study investigates the

determinants of capital structure of small firms in Thailand. Thus, this study will add to the understanding of the extent to which the results in Thailand, an Asian country, are consistent with prior studies.

Modigliani and Miller (1958) suggested that, in a perfect market, the capital structure would not affect the value of a firm; however, in the real world, the capital structure does affect the value of a firm because of taxes, information asymmetry and agency costs. In 1963, Modigliani and Miller (1963) studied the effect of taxes on capital structure and proposed that a company paying tax would benefit from debt because the interest paid would reduce the company's taxes. Therefore, the market value of a company having debt would be higher than that of the same company without debt.

DeAngelo and Masulis (1980) proposed the static trade-off theory, in which the benefit from the debt of saving taxes is compensated with increased business risk. They proposed that a company will have an appropriate level of debt if the present value of the tax savings offsets the increase in the present value of bankruptcy. According to trade-off theory, a profitable firm is anticipated to maintain a higher level of debt to make up for corporate tax. However, no evidence presented in the literature supports the trade-off theory in relation to small firms (Michaelas *et al.*, 1999; Sogorb-Mira, 2005). This may be because the profitability of small firms is lower than that of big companies; thus, the benefit of debt that reduces taxes is less valuable for small firms (Abor and Biekpe, 2009). Also, small companies are more likely to encounter financial distress (Lopez-Gracia and Sogorb-Mira, 2008; Pettit and Singer, 1985). The possible tax shield may not pay off for the high cost of debt arising from the high level of risk that creditors assign to small firms (Ang, 1991, 1992; McConnell and Pettit, 1984; Pindado *et al.*, 2006).

Myers (1984) and Myers and Majluf (1984) proposed the pecking order theory, which suggests that the management of companies will have more information about the real value of the company than outside investors. This asymmetry of information creates different costs of external funds. To resolve the problem of asymmetric information, the company will initially rely on internally generated funds, such as retained earnings. If these internal funds are exhausted, the company will likely seek funds from debt before financing from external equity. These preferences come from the comparative costs of various financing alternatives; firms would rather favor internal sources to expensive external financing (Abor, 2007; Myers and Majluf, 1984). Pecking order theory relates to small firms because there is more asymmetry of information in these firms and because of the higher cost of external equity (Mac an Bhaird and Lucey, 2010; Holmes and Kent, 1991). In addition, a general phenomenon in small firms is the owner's desire to maintain control of the company (Chittenden *et al.*, 1996; Jordan *et al.*, 1998). Thus, most small business owners still rely on their own capital (Dogra and Gupta, 2009). Past research has supported the notion that the capital structure of small firms conforms to pecking order theory (Abor, 2007; Mac an Bhaird and Lucey, 2010; Cressy and Olofsson, 1997; Hall *et al.*, 2004; Jordan *et al.*, 1998; Kotey, 1999; Michaelas *et al.*, 1999; Sogorb-Mira, 2005).

Jensen and Meckling (1976), who proposed agency theory, stated that managers normally take actions that benefit themselves at the expense of their shareholders. Agency problems derived from free cash flow (Jensen, 1986) imply that the leading profitable firms use higher debt so as to pay out more excess cash. Since the firm has to pay debts with cash, the amount of free cash flow that managers can use for their own sake will be reduced by debt; however, the small business owner and manager are often the same person. Accordingly, agency problems in this case are fewer (Sogorb-Mira, 2005). The primary agency conflict in small firms is generally between owners and

creditors (Hand *et al.*, 1982). The main concern for debt providers results from moral hazard, or the possibility of the small firm owner altering his actions to harm the debt providers by investing in projects with higher returns and greater risk (Mac an Bhaird and Lucey, 2010).

RESEARCH HYPOTHESES

The research on the capital structure of small firms has specified the characteristics that affect their capital structure, including profitability, firm size, business risk, firm growth, asset structure, age of firm and tax shields—all of which are detailed below.

Profitability: Profitability reflects the effectiveness of the business in making profits (Lim, 2012). The pecking order theory suggests that firms are likely to finance internally before financing externally due to higher external financing costs (Myers, 1984). Profitable firms are likely to have more retained earnings. The firm that has profits will tend to rely on retained earnings and not seek a loan from outside (Barton *et al.*, 1989; Titman and Wessels, 1988). Pecking order theory can be applied well to small firms (Cosh and Hughes, 1994) because small businesses cannot access external capital sources like larger businesses can (Abor and Biekpe, 2009). However, most of a small firm's external funds come from short-term borrowing (Pindado *et al.*, 2006). Esperanca *et al.* (2003) stated that to solve short-term deficits small firms tend to use short-term borrowing because short-term debt is likely to be determined by levels of profitability rather than the firm's size or age or the owner's characteristics. Thus, profitable firms may borrow more. Evidence supports the notion that the relationship between profitability and debt is negative (Abor and Biekpe, 2009; Chittenden *et al.*, 1996; Michaelas *et al.*, 1999). However, some empirical evidence (Fama and French, 2002; Zhang, 2010) has reported a positive relationship between these two variables. To test the association, the following hypotheses were developed:

- **H1a:** Profitability is negatively related to the short-term debt ratio
- **H1b:** Profitability is negatively related to the long-term debt ratio
- **H1c:** Profitability is negatively related to the total debt ratio

Firm size: Small size is likely to lead to severe asymmetry of information between owners and potential lenders (Holmes and Kent, 1991; Pettit and Singer, 1985) because of a dearth in uniform publicly available and reliable financial statements (Mac an Bhaird and Lucey, 2010; Pettit and Singer, 1985). Zhang (2010) mentioned that smaller firms encounter more difficulty in gaining access to loans. It may cost more for smaller firms to work out asymmetric information with creditors (Mac an Bhaird and Lucey, 2010). Smaller firms may be offered less debt funding Cassar (2004) or funding at a higher cost of debt than larger firms (Baas and Schrooten, 2006). Past research (Hall *et al.*, 2004; Titman and Wessels, 1988) has suggested that small firms may not obtain loans in the long term due to higher fixed transaction costs; instead, they may opt for short-term loans. Empirical evidence of the relationship between size and leverage is inconclusive. Mac an Bhaird and Lucey (2010) reported no association between firm size and short-term debt. The findings of previous studies (Cassar and Holmes, 2003; Esperanca *et al.*, 2003; Hall *et al.*, 2004; Michaelas *et al.*, 1999) suggest a negative relationship between firm size and short-term debt but a positive relationship with long-term debt. However, some researchers (Heyman *et al.*, 2008; Scherr and Hulburt, 2001) have suggested a negative effect of firm size on the long-term debt ratio. To test the association, the following hypotheses were developed:

- **H2a:** Firm size is negatively related to the short-term debt ratio
- **H2b:** Firm size is negatively related to the long-term debt ratio
- **H2c:** Firm size is negatively related to the total debt ratio

Business risk: Business risk is considered a key factor affecting the capital structure of a firm (Al-Najjar and Taylor, 2008). Kim and Sorensen (1986) found that high business risk firms cannot support a like amount of financial risk and thus will acquire less debt. Small firms are likely to have a higher level of business risk than large firms (Queen and Roll, 1987). Some research has found a negative relationship between business risk and the debt ratio (Friend and Lang, 1988; Kale *et al.*, 1991; Titman and Wessels, 1988). However, other research has supported the idea that business risk has a positive relationship with the debt ratio (Jordan *et al.*, 1998; Michaelas *et al.*, 1999; Nguyen and Ramachandran, 2006). Esperanca *et al.* (2003) reported a positive relationship between firm risk and both short- and long-term debt. To test this association, the following hypotheses were formulated:

- **H3a:** Risk is negatively related to the short-term debt ratio
- **H3b:** Risk is negatively related to the long-term debt ratio
- **H3c:** Risk is negatively related the total debt ratio

Firm growth: When firms experience growth, their requirements for funds are likely to increase (Chen and Chen, 2011). Therefore, demand for internal funds will increase and such growth will push the firm toward borrowing (Abor and Biekpe, 2009; Hall *et al.*, 2004). However, Myers (1977) argued that high-growth firms are inclined to have less leverage to reduce agency conflicts between owner and lender. To lessen the problem, therefore, growth opportunities should be financed with equity instead of leverage. So, firms with high growth opportunities may not issue debt in the first place. Empirical evidence has found a positive relationship between the growth and both the short-term and the long-term debt of small firms (Cassar and Holmes, 2003; Sogorb-Mira, 2005). However, Hutchinson (2003) reported that growth is not an essential determinant of borrowing for small firms in either the short or long term. To test the association, the following hypotheses were developed:

- **H4a:** Growth is positively related to the short-term debt ratio
- **H4b:** Growth is positively related to the long-term debt ratio
- **H4c:** Growth is positively related to the total debt ratio

Asset structure: Asset structure is associated with the capital structure of small firms (Chittenden *et al.*, 1996; Hall *et al.*, 2004; Van der Wijst and Thurik, 1993). Firms that have high tangible assets display higher liquidation value (Harris and Raviv, 1991; Titman and Wessels, 1988). The more tangible assets a firm has, the more collateral it has (Chen and Chen, 2011). Asymmetry of information in small firms may make lenders request collateral (Myers, 1977; Harris and Raviv, 1991) that they can use to reduce creditor risk in granting credit to small firms (Serrasqueiro, 2011). Empirical evidence has shown that collateral is essential for small firms to attain both short-term and long-term debt (Esperanca *et al.*, 2003; Michaelas *et al.*, 1999; Pindado *et al.*, 2006; Serrasqueiro, 2011), whereas, an abundance of previous studies (Abor and Biekpe, 2009; Cassar and Holmes, 2003; Hall *et al.*, 2004; Sogorb-Mira, 2005) have

reported a positive effect of asset structure only on long-term debt. To test this association, the following hypotheses were developed:

- **H5a:** Asset structure is positively related to the short-term debt ratio
- **H5b:** Asset structure is positively related to the long-term debt ratio
- **H5c:** Asset structure is positively related to the total debt ratio

Age of firm: The age of a firm is a tool to measure the popularity of a business (Diamond, 1989). Popularity is attained over time as the market gradually comes to know what the firm can do. Older firms often have a good record and therefore can take on debt more easily. Younger small firms have not had sufficient time to build a reputation or relationships with lenders that would encourage creditors to grant them satisfactory credit terms. Thus, reputation and credibility may contribute to solving the problems of asymmetric information between small firms and creditors (Berger and Udell, 1998; Diamond, 1989; Serrasqueiro *et al.*, 2012). Petersen and Rajan (1994) found that older firms have higher debt ratios because they are expected to be higher quality firms. The empirical evidence suggests that age has a negative association with both short-term and long-term debt (Esperanca *et al.*, 2003; Michaelas *et al.*, 1999; Hall *et al.*, 2004) found a negative association between firm age and short-term debt but a positive association with short-term debt. To test this association, the following hypotheses were developed:

- **H6a:** Firm age is positively related to the short-term debt ratio
- **H6b:** Firm age is positively related to the long-term debt ratio
- **H6c:** Firm age is positively related to the total debt ratio

Tax shields: Normally, small firms make less profit than larger firms and therefore firms with low profit reap fewer advantages from tax savings. Thus, the advantage of a tax shield will have low value for small firms (Mac an Bhaird and Lucey, 2010). McConnell and Pettit (1984) and Ang (1991, 1992) suggested that small firms have less motivation to use debt to save tax, which makes the trade-off theory irrelevant for small firms. Various researchers investigating trade-off theory and small firms have found no evidence to support this theory (Michaelas *et al.*, 1999; Sogorb-Mira, 2005). To test the association, the following hypotheses were formulated:

- **H7a:** Tax shields have no relationship with the short-term debt ratio
- **H7b:** Tax shields have no relationship with the long-term debt ratio
- **H7c:** Tax shields have no relationship with the total debt ratio

METHODOLOGY

Sample: This research used panel data of small firms in the manufacturing industry. Based on guidelines established by the Thai Department of Business Development (2012), this research defined small firms as those having no more than 50 million baht (or equivalent) in fixed assets value (31 baht is approximately equivalent to US\$1). Data were collected from the Thai Department of Business Development (2012). The representative sample consisted of businesses with consecutive operating data from 2007 through 2010. Enterprises with incomplete variable data were removed. The final data set was therefore composed of a panel of 191 firms observed over a four-year period and the total number of observations used in the study was 764.

Table 1: Abbreviation, definition and measurement of the dependent and independent variables

Variables	Abbreviation	Definition	Measurement
Dependent variables			
Short-term debt ratio	STD	A ratio showing the percentage of a firm's assets that depends on its short-term financing	Short-term debts to total assets
Long-term debt ratio	LTD	A ratio showing the percentage of a firm's assets that are financed with long-term borrowing	Ratio of long-term debts to total assets
Total debt ratio	TTD	A ratio showing the percentage of a firm's assets that are financed with borrowing	Ratio of total debts to total assets
Independent variables			
Profitability	PROF	Return on assets of a firm	Ratio of earnings before interest and taxes to total assets
Size	SIZE	The size of a firm	Logarithm of total assets
Risk	RISK	The business risk of a firm or standard deviation of operating profits	Ratio of the standard deviation of profits before tax to total assets
Growth	GROWTH	The increase in sales over a specific period of time annually	Growth rate of total sales
Asset structure	AST	Ratio of fixed assets to total assets	Sum of land, buildings and equipment divided by total assets
Age	AGE	Length of time that the company has been in business	No. of years that the company has been in business
Tax shield	TAX	Tax rate	Ratio of tax payment to profit before tax

Variables: Table 1 presents the variables used in this study, together with their corresponding measures. Consistent with previous research (Abor, 2007; Kyereboah-Coleman, 2007; Michaelas *et al.*, 1999), three different measures of debt ratio based on book values were employed: Ratios for short-term debt, long-term debt and total debt. Definitions of independent variables (except for TAX, which follows Karadeniz *et al.*, 2009) follow those of previous studies (Abor and Biekpe, 2009; Cassar and Holmes, 2003; Esperanca *et al.*, 2003; Hall *et al.*, 2004; Sogorb-Mira, 2005).

Model: The regression model used to test the determinants of financial leverage in small firms is as follows:

$$STD = \beta_0 + \beta_1 PROF + \beta_2 SIZE + \beta_3 RISK + \beta_4 GROWTH + \beta_5 AST + \beta_6 AGE + \beta_7 TAX + \epsilon \quad (1)$$

$$LTD = \beta_0 + \beta_1 PROF + \beta_2 SIZE + \beta_3 RISK + \beta_4 GROWTH + \beta_5 AST + \beta_6 AGE + \beta_7 TAX + \epsilon \quad (2)$$

$$TTD = \beta_0 + \beta_1 PROF + \beta_2 SIZE + \beta_3 RISK + \beta_4 GROWTH + \beta_5 AST + \beta_6 AGE + \beta_7 TAX + \epsilon \quad (3)$$

RESULTS

Table 2 provides a descriptive summary of important variables. Small firms in the manufacturing industry used in the sample had a 51.66% average short-term debt ratio and a 22.69% long-term debt ratio, underscoring the importance of short-term debt over long-term debt in financing of Thai small firms. Total debt constituted 74.35% of total assets and the remaining

Table 2: Descriptive statistics of the dependent and independent variables

Variables	Mean	Maximum	Minimum	Std. Deviation	Observations
Ttd	74.3500	21.41	0.00	1.28240	764
Ltd	22.6900	6.39	0.00	0.52530	764
Std	51.6600	21.41	0.00	1.18070	764
PROF	2.9200	80.00	-3.56	0.22560	764
Size	6.9462	7.85	4.13	0.46656	764
Risk	5.1100	2.31	0.00	0.11856	764
Growth	5.3800	536.55	-94.25	50.64804	764
Ast	21.3700	92.00	0.00	0.21804	764
Age	16.7400	44.00	7.00	7.44570	764
Tax	13.8000	61.41	-69.48	3.38791	764

Table 3: Pearson correlation coefficients among the independent variables employed in regression

Variables	Prof	Size	Growth	Risk	AST	Age
PROF						
Size	0.207 0.000**					
Growth	0.225 0.000**	-0.030 0.408				
Risk	-0.682 0.000**	-0.410 0.000**	0.012 0.749			
AST	-0.011 0.771	0.307 0.000**	-0.006 0.861	-0.085 0.019*		
Age	0.091 0.012*	0.177 0.000**	-0.058 0.110	-0.071 0.048*	0.011 0.762	
Tax	0.011 0.764	0.070 0.052	0.033 0.932	-0.008 0.831	-0.004 0.905	0.115 0.001**

***Significant at the 5 and 1% level, respectively

25.65% belonged to equity. The asset structure of the business was 21.37% fixed assets versus total assets. The operational result was measured by the return on assets, which accounted for 2.92%. The growth rate of sales was 5.38%. Firm risk demonstrated an average value of 5.11. The tax rate was approximately 13.80% lower than the 15% tax rate officially established by Thai tax legislation for small companies that have net profits between 150,000 and 1,000,000 baht. The average age of the firms was 16.74 years.

Correlations among independent variables may have caused problems in interpreting the regression coefficients. To examine the degree of multicollinearity among the independent variables, a correlation matrix was created indicating the magnitude and direction of the association between independent variables (Table 3). The correlation coefficients between independent variables displayed in Table 3 were below 0.70, which is a threshold for correlation coefficients, suggesting the absence of multicollinearity (Anderson *et al.*, 2002). Additionally, the Variation Inflation Factor (VIF), a traditional measure for multicollinearity, was calculated. A VIF that exceeds 10 indicates a multicollinearity problem (O'Brien, 2007). The VIFs shown in Table 4 were within this value (Max VIF = 2.295), which indicated no cause for concern about multicollinearity among the independent variables.

According to the research results in Table 4, there is a negative relationship between profitability and all three debt ratio measures, thus supporting H1a, H1b and H1c. Therefore, the findings coincided with the hypothesis that less-profitable small firms are prone to seeking external

Table 4: Ordinary least-squares regression results of determinants of capital structure of Thai small firms

Independent variables	Debt			VIF
	STD (β)	LTD (β)	TTD (β)	
Constant	0.826 (1.542)	0.758* (2.390)	1.584** (2.838)	
PROF	-2.394** (-11.909)	-0.461** (-3.879)	-2.855** (-13.638)	2.132
Size	-0.086 (-1.100)	-0.100* (-2.167)	-0.186* (-2.287)	1.377
Risk	2.902** (7.311)	-0.045 (-0.190)	2.858** (6.912)	2.295
Growth	0.002** (2.887)	0.001 (1.526)	0.002** (3.639)	1.121
AST	0.027 (0.860)	0.449** (5.051)	0.476** (3.038)	1.114
Tax	-0.001 (0.908)	-0.002 (-0.297)	-0.003 (-0.279)	1.017
Age	0.018** (3.876)	0.005 [†] (1.921)	0.016** (3.672)	1.058
R ²	47.7	7.5	51.9	
F-value	98.378	8.788	116.455	
Significance of F	0.000**	0.000**	0.000**	
N	764	764	764	

t-statistics in parentheses, †, *, **Significant at the 10, 5 and 1% level, respectively

financing. With respect to size, it was found that the size of the business has no relationship to short-term debt, thus rejecting H2a; however, a statistically negative relationship exists between firm size and both long-term debt and total debt, thus supporting H2b and H2c. The findings imply that relatively larger firms borrow long-term debt less than smaller firms.

In terms of firm risk, the results showed a sign contrary to the sign hypothesized. The findings suggest that risk has a positive relationship with short-term debt and total debt, but no association with long-term debt, thus rejecting H3a, H3b and H3c. These results are in line with the notion that small firms with operating risk may encounter difficulties in obtaining long-term debt. The relationship between growth and debt ratios proved to be positive for short-term debt and total debt but not long-term debt, thus accepting H3a and H3c but rejecting H3b. This was an indication that Thai small firms rely on short-term debt to finance their growth.

The results also showed that asset structure has a positive but insignificant relationship with short-term debt, thus rejecting H4a; however, a positive relationship was found between asset structure and both long-term and total-debt. Therefore, H5b and H5c were accepted. The results pointed out that asset structure plays an important role in small firms' ability to obtain long-term debts. The findings showed a positive relationship between age and all three debt ratio measures. Therefore, H5a, H5b and H5c were accepted. In terms of the relationship between the tax shield and debt ratios, the empirical evidence illustrated that the tax shield had no relationship with the debt ratio in all three measures of debt; thus, H6a, H6b and H6c were all accepted.

DISCUSSION

Thai small firms are highly leveraged, as shown by the mean total debt ratio of 74.35%; however, most of these debts were short-term, as opposed to long-term, suggesting that Thai small firms were highly dependent on short-term debt for their operations. This result is consistent with previous research which found that small firms would rather obtain short-term than long-term credit (Abor and Biekpe, 2009; Cassar and Holmes, 2003; Hall *et al.*, 2004; Sogorb-Mira, 2005).

Profitability negatively influences the short-term debt ratio with a coefficient value of -2.394 and profitability is negatively related to long-term debt ratio with a coefficient value of -0.461 (Table 4). A one-unit increase in profitability reduces short-term debt ratio by 2.394 units,

and a one-unit increase in profitability reduces long-term debt ratio by 0.461 units. Therefore, the profitability has a high degree of impact on debt ratio relative to other significant factors in the model. The finding that a negative relationship existed between debt ratio and profitability suggested that more profitable small firms gained greater access to internal funding and thus were less dependent upon external debt to support their operations. These findings coincided with the notion that owners of small firms in Thailand sourced their capital firstly from their own money, secondly from short-term borrowing, thirdly from long-term borrowing and lastly from external equity as the last resort. The findings confirmed, to a large extent, the previously mentioned research (Abor and Biekpe, 2009; Esperanca *et al.*, 2003; Hall *et al.*, 2004; Lopez-Gracia and Sogorb-Mira, 2008; Michaelas *et al.*, 1999).

Regarding the relationship with size, the findings supported previous studies (Heyman *et al.*, 2008; Scherr and Hulburt, 2001) that showed a negative relationship between size and long-term debt. These findings suggested that, in the Thai context, larger small firms accumulated more internal funding, thereby lowering the amount of long-term debt needed. This result corresponded with the pecking order theory.

Risk is positively associated with the short-term debt ratio, with a coefficient factor of 2.902 (Table 4). A one-unit increase in risk increases the short-term debt ratio by 2.902 units, demonstrating that the risk has a significant influence on the short-term debt ratio. One possible explanation is that small firms with operating risk may face difficulties in obtaining long-term debt; therefore, small firms must obtain funds through short-term debt. This is because lenders preferred to grant short-term rather than long-term credit to small firms in order to reduce default risk. As Myers (1977) mentioned, short-term debt has a short-term maturity, so it enables lenders to monitor firms and stop making loans more easily in the case of default. The result confirmed that higher operating risk may leave small firms with no alternative but to request short-term debt, as mentioned in the aforementioned research (Nguyen and Ramachandran, 2006; Scherr and Hulburt, 2001).

Regarding the growth variable, the findings were in line with previous studies, such as (Esperanca *et al.*, 2003; Hall *et al.*, 2004; Pindado *et al.*, 2006), which suggested that a positive relationship existed between growth and short-term debt but not long-term debt. This implied that small firms with higher growth rates borrowed short-term debt more than those that had low growth rates. Growth has a coefficient factor of .002 in the short-term debt ratio model (Table 4). This shows that the growth factor has a relatively small degree of influence on capital structure versus other significant factors in the model.

Asset structure is positively related with long-term debt ratio with a coefficient factor of 0.449 (Table 4). A one-unit increase in asset structure increases long-term debt ratio by 0.449 units, revealing strong determinants of long-term debt ratio. The influence of collateralisable assets on determining the level of long-debt in small firms was in line with previous studies indicating that collateral played an essential role in obtaining long-term loans (Abor and Biekpe, 2009; Cassar and Holmes, 2003; Hall *et al.*, 2004; Sogorb-Mira, 2005; Pindado *et al.*, 2006). The results suggested that small firms secured long-term debt financing with their fixed assets.

With regards to the relationship between the age of firms and their ability to obtain loans, age is positively connected with the short-term debt ratio, with a coefficient factor of .018 and positively related to the long-term debt ratio, with a coefficient value of 0.005 (Table 4). A one-unit increase in age increases the short-term debt ratio by 0.018 units and a one-unit increase in age increases the long-term debt ratio by 0.005 units. The findings support the hypothesis that firms that have

been in operation for a long time can borrow more because they are well-known within business circles and to lenders. This finding confirmed Petersen and Rajan (1994) finding that older firms are more likely to be considered high-quality firms.

The study also found that the tax shield had no relationship with debt ratio in all three measures of debt ratio. The mean tax rate that the sample group paid was about 13.80% lower than the minimum rate of 15% established by Thai tax legislation for small firms having a profit range of 150,001-1,000,000 baht. The fact that the mean tax rate was lower than the minimum rate which profitable small firms had to pay reflected that some small firms had net profits lower than the minimum profit required to pay tax. This was consistent with small businesses having little motivation to use debt as a way to save on taxes due to their low profit levels.

The results of the total debt ratio displayed a combination of the determinants of long-term and short-term debt ratios; however, the results for total debt were closer to the results of short-term than to long-term debt. As mentioned by Pindado *et al.* (2006), this may have resulted from the greater proportion of short-term debt in small firms' total debt.

CONCLUSION

This research studied the determinants of the capital structure of small firms in Thailand over the period of 2007-2010. It was found that short-term debt comprises a relatively high fraction of total debt at around 51.66% of total financing. The negative relationship between profitability and both short- and long-term debt indicates that Thai small firms prefer internal financing to debt financing. This result is in line with the pecking order theory and Thai small firms' use of profits to reduce their leverage level. The negative relationship between firm size and long-term debt ratio implies that bigger firms incur less long-term debt.

Small firm's capability to provide collateral plays a more important role in their ability to access long-term loans than a credit history developed over time. Older firms are the most dependent on debt, particularly short-term debt. The positive relationship between short-term debt and growth suggests that small-but-growing Thai firms are likely to have insufficient earnings to support all of their growth internally. Thus, they tend to rely more on short-term loans to finance their growth. Firms with high operating risk are likely to use short-term liabilities where debt repayment and interest are easily monitored by creditors. In addition, small businesses in Thailand have low motivation to use debt to save on taxes due to their low profit levels.

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