An Empirical Study on the SME's Capital Structure in Taiwan: the Effect of the Global Financial Crisis of 2007

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1. Introduction

The subprime mortgage crisis that commenced in the United States of America during 2007 resulted in large scale financial chaos not only in the U.S., but also in many other countries around the world. In the USA during 2008, Lehman Brothers filed bankruptcy; JPMorgan Chase acquired Bears Sterns; and the Federal Government bailed out AIG, Fannie Mae, and Freddie Mac. The crisis spread to Taiwan rapidly, causing the downturn of sales, layoffs, and financial stresses. It depressed the Taiwan stock market by about 5,000 points, decreasing from 9,000 points in September 2007 to about 4,000 points in December 2008.

The capital structure choice is one of the most important decisions faced by corporate management (Degryse, 2010). Most empirical work among the early studies addressing capital structure have generally focused on large publicly traded firms which often have several types of securities traded in the markets, with fewer articles concentrating on small and medium-sized firms (SMEs) (Frank and Goyal, 2008). Usually, the SMEs encounter greater difficulty in obtaining funds, and have more limited financing alternatives than the large firms when funds are needed. However, the SMEs represent a vast portion of the economy of most countries (Sogorb-Mira, 2005). In this regard, there were about 1, 240,000 (98% of the total firms) SMEs in Taiwan in 2006, creating 7,550,000 jobs (77% of the total) with total sales of US$ 34 billion (30% of the total) (The White Paper, Ministry of Economic Affairs, Taiwan, 2007). Since the SMEs have made such a great contribution to Taiwan's economy and employment, it's crucial to explore the capital structure of the

SMEs in Taiwan and develop an understanding about how the SMEs adjusted their financial policies and measures to overcome the global financial adversity since 2007.

Using the data of 478 SMEs in Taiwan as a sample, this study explores the effects of the financial crisis of 2007 on the capital structure of the SMEs in Taiwan. Firm size applies a significant positive effect on all three types of capital structures, i.e., total debt, long-term debt, and short-term debt leverages during both ante and post the financial crisis. Intangible assets reveal a significant negative influence on total debt and short-term debt leverages prior to the financial crisis, while they perform a significant negative effect only on the short-term debt leverage post-financial crisis. Tax shields reveal a non-significant negative effect on all three types of capital structures prior to the financial crisis, while they exert a significant negative effect on both total debt and short-term debt leverages after the financial crisis. In addition, working capital reveals a non-significant positive effect on long-term debt leverage ante-financial crisis but becomes a significant negative factor post-financial crisis on long-term debt for the SMEs in Taiwan.

This article is organized into the following sections: Section 2: Theories of Corporate Capital Structure and Empirical Hypothesis, Section 3: Empirical Model and Data collection, Section 4: Statistical Results and Discussions, and Section 5: Conclusion.

2. Determinants of Corporate Capital Structure

A firm's choice of capital structure can be determined by both external and internal factors. The external factors arise from a firm's environment and are beyond the control of the firm's mangers, such factors as a country's economic conditions and institutional policies. For example, Rajan and Zingales (1995) selected the institutional factors of bankruptcy laws, development of capital markets, and tax codes and demonstrated each factor's effect on the firm's capital structure. A firm's choice of capital structure may also be determined by certain internal factors. Internal factors are attributes that can be controlled, though not always completely, by a firm's managers such as size, asset structure, etc. De Jong, Kabir and Ngyune (2008) demonstrate that capital structure determinants vary among different countries and assert that some specific factors have direct or indirect effects on determining a firm's capital structure. Deesomsak et al. (2004) find that the 1997 Asian economic crisis had a substantial effect on firm's capital structure.

For this study, a total of five primary elements are selected to explore whether their effects changed firm capital structure during/post the financial crisis of 2007 for the SMEs in Taiwan. The factors selected are firm size, asset structure, profitability, growth, and tax shields. Three measures are used as proxies for the capital structure: total debt ratio (TDR), long-term debt ratio (LTDR), and short-term debt ratio (STDR). Relevant theories and pioneer studies about each primary variable are presented and possible hypotheses are formulated.

2.1. Firm size

Warner (1977), Ang et al. (1982) and Pettit and Singer (1985) assert that larger firms tend to be more diversified and fail less often, therefore, firm size is an inverse proxy for the likelihood of bankruptcy. The studies of Fama and French (2002) and Degryse, Goeij, and Kappert (2012) confirm the assertion of Warner (1977), Ang et al. (1982) and Pettit and Singer (1985). The trade-off theory (TOT) conjectures that the optimal capital structure will reflect a trade-off between tax-shield benefits and bankruptcy costs (Jensen and Meckling, 1976; Myers, 1977; Harris and Raviv, 1990 and 1991) which implies that when firms experience smaller bankruptcy costs, they tend to utilize greater debt to take advantage of interest expense deductions to lower taxes. The aforementioned theories and related studies suggest that when a firm is larger, its probability of bankruptcy is lower and the tax shield benefit is higher leading to a higher level of debt financing. Hall et al. (2000) and Sogorb-mira (2005) argue that the SMEs have smaller amounts of tangible assets and lenders usually impose a maturity restriction on credit based on the lives of the collateral assets. Therefore, the SMEs are less likely to use long-term debt and more likely to use short-term debt. Based on the above assertions, the hypotheses regarding the effects of firm size are formulated as:

H-1a: Firm size is positively related to total debt leverage.

H-1b: Firm size is positively related to long-term debt leverage.

H-1c: Firm size is negatively related to short-term debt leverage.

2.2 Tangible Assets

Assets can be grouped into two categories, tangible and intangible, with each group of assets having its own effects on the firm capital structures. Tangible assets can be employed as collateral which allows companies with greater tangible assets values to utilize more debts as financial resources with lower costs. Furthermore, tangible assets reduce moral hazard risks, because tangible assets convey a positive signal to creditors in case of firm's defaults. Based

on TOT, tangible assets could reduce bankruptcy costs if they are used as collateral. TOT suggests a positive relationship between tangible assets and debts. In addition, from the pecking order theory (POT) perspective, tangibility reduces information asymmetry problems between insiders and outsiders. POT also suggests a direct relationship between tangibility and debt financing. Hall et al. (2004) analyzed the determinant of capital structure among European companies and found that tangibility directly correlated to long term debt while it is negatively correlated with short term debt. Moreover, Sogorb-Mira (2005) found supportive results for the inverse correlation among tangibility and short term debt, stating that the negative correlation between tangibility and short term debt may be explained by the maturity matching principle. The maturity matching principle (Brealey and Myers, 2000) states that a firm should match its financial needs based on time horizon of its financial requirement, for instance, it should satisfy its working capital needs with short term debt, while it should supply its investment in fixed assets from long term debt resources. Based on the above theories and discussions, the following hypotheses are formulated:

H-2a: Tangible assets have a positive relationship with total debt leverage.

H-2b: Tangible assets have a positive relationship with long-term financial leverage.

H-2c: Tangible assets have a negative relationship with short-term financial leverage.

2.3 Growth Opportunities

According to Myers (1977), the underinvestment problem becomes more serious in companies with better growth opportunities and hence causes creditors to become more reluctant to loan to this type of firm. Following the assertion of Myers (1977), there is a negative relationship between debt and growth opportunities. However, firms of this type may possibly mitigate this problem by utilizing short-term debt. Michaelas et al. (1999) finds a positive relationship between growth potential and short-term debt because SMEs mainly rely upon short-term debt for financing. Based on the above assertions, the following hypotheses are formulated:

H-3a: Growth opportunities have a negative relationship with debt leverage.

H-3b: Growth opportunities have a negative relationship with long-term debt leverage.

H-3c: Growth opportunities have a positive relationship with short-term debt leverage.

2.4 Profitability

The association between profitability and debt can be explored from two perspectives.

First, based on a self-financing-capability perspective, profitable firms are able to generate enough profit and cash flows to satisfy the firms' financial needs. Therefore, the relationship between profitability and debt financing should be negative. Likewise, based on POT, Myers (1984) and Myers and Majluf (1984) argue that firms will prefer internal to external capital sources. These internal sources are generated through profit and accumulated via retained earnings. Therefore, according to POT, a firm with higher profitability would have sufficient internally generated funds and rely less upon external debt. Furthermore, SME mangers are often shareholders of these companies and more concerned about the risk of losing their control and operation of the firms. In cases where SMEs need external funds, they prefer short-term debt to long-term debt since short-term debt is usually less restrictive (Hamilton and Fox, 1998; Sogorb-Mira, 2005). Therefore, the following hypotheses are formulated:

H-4a: Profitability has a negative relationship with total debt leverage.

H-4b: Profitability has a negative relationship with short-term debt leverage.

2.5 Tax shields

Financial leverage will reduce a firms' taxable revenue because a portion of revenue will be used to pay debt interest to debtors. However, increasing debt can result in a higher probability of bankruptcy. Therefore, according to TOT, firms will choose an optimal capital structure that balances the tax benefits of debt and the costs of bankruptcy. Modigiani and Miller (1963) conclude that firms would prefer debt to other financing sources due to the tax deductibility of interest payments. The preceding discussion suggests that when the effective tax rate goes higher, debt financing becomes more preferable by firms. However, Pettit and Singer (1985) point out that the above fiscal approach does not apply to SMEs because SMEs are less likely to be profitable or receive sufficient tax benefits from using debt financing, and are therefore less likely to use debt to receive tax shields. Based on the assertion of Pettit and Singer (1985), Hypothesis 5 is developed as:

H5: There is no relationship between tax shields and total debt leverage.

3. Empirical Model and Data collection

3.1 An Empirical Model

This research investigates how selected firm characteristics affect capital structures for Taiwanese SMEs and explores how these SMEs in Taiwan adjusted their capital structures to adapt to the challenges of the financial crisis originating in 2007. The

initial literature advanced five firm characteristics as explanatory (primary) independent variables. These five primary independent variables include firm size (expressed as total assets; Fama and French, 2002; Sogorb-Mira, 2005), asset structure (expressed as total tangible assets; Frank and Goyal, 2003; Sogorb-Mira, 2005;), growth opportunities (expressed as total intangible assets; Michaelas et al., 1999), profitability (expressed as ROA; Michaelas et al., 1999), and tax shields (expressed as tax rate; Kim and Sorensen,1986; Ozkan, 2000). To these five primary variables, two additional firm characteristics were selected as secondary independent variables. The two secondary variables are working capital and depreciation expenses. These two secondary variables are introduced into the model because higher levels of working capital and/or depreciation expenses (non-cash expense) cause the firm's expected dependence on debt financing is lower. The dependent variable is a firm's capital structure and is defined as a firm's debt ratio. The regression model is presented as:

$$TD_{it} = a_0 + a_1 SIZE_{it} + a_2 TANG_{it} + a_3 INTANG_{it} + a_4 ROA_{it} + a_5 TAX_{it} + a_6 DEP_{it} + a_6 WC_{it} + e_{it} \quad (1)$$

Where:

TD_{it}= total debt ratio= total liabilities/total assets;
$SIZE_{it}$= a firm's size= the natural log of total assets;
$TANG_{it}$= deflated tangible assets= total tangible assets/total assets;
$INTANG_{it}$= deflated intangible assets= total intangible assets/total assets;
ROA_{it}= return on total assets= income before interests, taxes, and depreciation/total assets;
TAX_{it}: tax rate= income tax expense/income before interests and taxes;
DEP_{it}= deflated depreciation expenses = depreciation/total assets;
WC_{it}= deflated working capital= (current assets-current liabilities)/total assets;

Moreover, Sogorb-Mira (2005) indicates that total debt ratio can be classified into two components i.e. long-term debt ratio (LTDR) and short-term debt ratio (STDR). Therefore, two additional regression functions can be constructed as follows:

$$LTDR_{it} = a_0 + a_1 SIZE_{it} + a_2 TANG_{it} + a_3 INTANG_{it} + a_4 ROA_{it} + a_5 TAX_{it} + a_6 DEP_{it} + a_6 WC_{it} + e_{it} \quad (2)$$

Where:

LTDRit= total debt ratio= long-term liabilities/total assets;

$$STDR_{it} = a_0 + a_1 SIZE_{it} + a_2 TANG_{it} + a_3 INTANG_{it} + a_4 ROA_{it} + a_5 TAX_{it} + a_6 DEP_{it} + a_6 WC_{it} + e_{it} \quad (3)$$

Where:

STDRit= short-term debt ratio= short-term liabilities/total assets.

It is explicitly noted that in order to better explore the mentality of managers about urgent borrowing (to better reflect the meaning of loan/borrow in Chinese culture and business practice) and more accurately detect the effect of Taiwan monetary operations on the Taiwan SME short-term financial needs, the regular accounts payable, wages/salaries payable, and warranty liability are excluded from the short-term debts. Therefore, the short-term debts mainly include short-term loans, short-term notes payable, and long-term loans that will mature in one year in this study. However, the long-term debts include all accounts presented in the long-term liability section on balance sheets, and total debts are the sum of the long-term debts and the short-term debts as specifically adjusted as above.

3.2 Data Sources and Sample Selection.

According to the Small and Medium Enterprise Law of Taiwan, the definition of small and medium sized enterprises is a business employing 200 or less. A total of 2,868 firm-year data were retrieved from the Taiwan Economics Journal (TEJ), which includes 478 firms covering the periods 2004-2006 (before the financial crisis) and 2008-20010 (post the financial crisis). The data of 2007 were not included to insure that the year of transition (2007) did not contaminate either of the time period (pre and post 2007) data pools (assuming the adaptation to the financial crisis occurred quickly within 2007).

4. Statistical Results and Discussions

4.1 Descriptive Statistics

The statistics of median, mean, maximum, and minimum of each firm characteristic are presented in Table 1 in which Panel A presents the statistics and observed values for the period of 2004-2006 (prior crisis), while Panel B for the period of 2008-2010 (post crisis). As disclosed in Panel A of Table 1, the mean of the total debt ratio (TDR) is 0.2093, while the means of long-term debt ratio (LTDR) and the short-term debt ratio (STDR) are 0.0617 and 0.1476, respectively. This indicates that Taiwan's SMEs financed approximately 6% of their total assets through long-term debt and 15%

through short-term debt during 2004-2006. This confirms the position of Sogorb-Mira (2005, P450) that SMEs employ predominantly short-term debt as debt financing.

Table 1: Summary of the Statistics of the Variables

Panel A : Period 2004-2006					
	Median	Min	Max	Mean	Std.Dev
TDR	0.1831	0	0.9260	0.2093	0.1863
LTDR	0.0159	0	0.6663	0.0617	0.0922
STDR	0.0977	0	0.926	0.1476	0.1600
SIZE	6.1374	5.0175	7.4694	6.1801	0.4005
TANG	0.1422	0	0.9641	0.1935	0.1738
INTANG	0	0	0.3147	0.0045	0.0173
ROA	0.0764	-0.878	0.6221	0.069	0.1285
TAX	0.0638	-11.2814	8.1804	0.0898	0.5267
DEP	0.1545	-143.008	73.6407	0.268	6.3459
WC	0.2286	-0.7777	0.8868	0.2273	0.2223
Panel B : Period 2008-2010					
	Median	Min	Max	Mean	Std.Dev
TDR	0.1300	0	1.1010	0.1788	0.1837
LTDR	0	0	0.8052	0.0463	0.0854
STDR	0.0764	0	1.101	0.1325	0.1591
SIZE	6.1741	4.5112	7.7862	6.2011	0.4510
TANG	0.1064	0	0.9521	0.165	0.1723
INTANG	0	0	0.3198	0.005	0.0224
ROA	0.0482	-0.9457	0.5985	0.0348	0.1277
TAX	0.0196	-1.9897	8.779	0.0867	0.3583
DEP	0.0882	-153.407	186.724	0.5159	9.6865
WC	0.2225	-1.0025	0.9328	0.2309	0.2504

Note:

A. Definitions for variables: TDR: total debt ratio= total liabilities/total assets; LTDR: long-term debt ratio=long-term liabilities/total assets; STDR: short-term debt ratio= current liabilities/total assets; SIZE: a firm's size= the natural log of total assets; TANG: deflated tangible assets= total tangible assets/total assets; INTANG: deflated intangible assets= total intangible assets/total assets; ROA: return on total assets= income before interests, taxes, and depreciation/total assets; TAXR: tax rate= income tax expense/income before interests and taxes; DEP: deflated depreciation expenses = depreciation/total assets; WC: deflated working capital= (current assets-current liabilities)/total assets.

4.2 Regression Results and Discussions

Table 2 presents the results for regression equations 1, 2, and 3 which have a dependent variable of total debt ratio (TDR), long-term debt ratio (LTDR), and

short-term ratio (STDR), respectively. In Table 4, the results for the period 2004-2006 (prior the crisis) are presented on Panel A, while Panel B presents the results for the period 2008-2010 (post the crisis). The results for the period 2004-2006 can be regarded as the results of the capital structure under a normal business environment in Taiwan. During this period, the SMEs capital structures were better expressed by total debt ratio (R-square 0.32) and short-term-debt ratio (R-square 0.36) than expressed by long-term debt ratio (R-square 0.06).

This result suitably reflects that the SMEs rely more on short-term debt financing than long-term debt financing, supporting the proposition of Sogorb-Mira (2005, P450).

Table 2: Regression Results

Panel A: Period 2004-2006									
	TDR			LTDR			STDR		
	Coef.	t	P>t	Coef.	t	P>t	Coef.	t	P>t
SIZE	0.0525	4.78	0.00**	0.0236	3.70	0.00**	0.0290	3.15	0.00**
TANG	-0.0957	-3.65	0.00**	0.1105	7.27	0.00**	-0.2061	-9.42	0.00**
INTANG	-0.6361	-2.84	0.01**	-0.1306	-1.00	0.32	-0.5055	-2.70	0.01**
ROA	-0.2883	-8.43	0.00**	-0.0726	-3.66	0.00**	-0.2157	-7.54	0.00**
TAX	-0.0093	-1.20	0.23	-0.0071	-1.57	0.12	-0.0022	-0.34	0.73
DEP	-0.0004	-0.58	0.56	-0.0004	-0.98	0.33	0.0000	-0.01	0.99
WC	-0.3757	-16.89	0.00**	0.0060	0.47	0.64	-0.3817	-20.52	0.00**
CONS	0.0122	0.18	0.86	-0.1005	-2.43	0.02*	0.1127	1.89	0.06
F-Value		96.45			13.747			113.500	
P-Value		0.00**			0.00**			0.00**	
R^2		0.321			0.063			0.358	
$ADJR^2$		0.318			0.059			0.355	
No.Obs		1434			1434			1434	
Panel B: Period 2008-2010									
	TDR			LTDR			STDR		
	Coef.	t	P>t	Coef.	t	P>t	Coef.	t	P>t
SIZE	0.0698	6.94	0.00**	0.0277	5.25	0.00**	0.0421	4.81	0.00**
TANG	-0.0721	-2.84	0.01**	0.0795	5.96	0.00**	-0.1517	-6.87	0.00**
INTANG	-0. 2224	-1.13	0.26	0.1455	1.40	0.16	-0.3679	-2.14	0.03*
ROA	-0. 1798	-5.11	0.00**	-0.0414	-2.24	0.03*	-0.1384	-4.53	0.00**
TAX	-0. 0364	-3.07	0.00**	-0.0038	-0.60	0.55	-0.0326	-3.16	0.00**
DEP	-0.0003	-0.68	0.50	-0.0001	-0.45	0.65	-0.0002	-0.51	0.61
WC	-0. 3243	-18.23	0.00**	-0.0383	-4.10	0.00**	-0.2860	-18.49	0.00**
CONS	-0. 1564	-2.44	0.01**	-0.1288	-3.82	0.00**	-0.0276	-0.50	0.62
F-Value		74.70			14.399			72.196	
P-Value		0.00**			0.00**			0.00**	
R^2		0.2683			0.066			0.262	
$ADJR^2$		0.2647			0.061			0.258	
No.Obs		1434			1434			1434	

A. Definitions for variables: see Table 1.

B. *: significant at 1% level; **: significant at 5% level.

As shown in Panel A of Table 2, the variable of firm size (SIZE) has a significant

positive relationship with TDR, LTDR and STDR before the crisis. Therefore, Hypotheses H-1a and H-1b are confirmed (Firm size is positively related to both total debt and long-term debt leverages), but hypothesis H-1c is not supported. A likely explanation for firm size showing a positive effect on short-term debt leverage rather than a negative effect as hypothesized by H-1c, is that larger firm sizes for SMEs in Taiwan make it easier to receive approval for short-term debts. It might indicate that lenders in Taiwan are usually more conservative culturally than those in western economies and consider the firm's size and affordability of collateral as a critical warranty for loan security. Panel B of Table 4 also reveals that firm size has a significant positive relationship with all three, TDR, LTDR, and STDR, during the period post to the crisis. This indicates that firm size and collateral ability are essential for obtaining loans during both normal and stress times. This also implies that Taiwanese monetary institutes prefer the loans with lower bankruptcy cost (larger firm size).

As presented in Panel A of Table 2, tangible assets (TANG) exerts a significant negative effect on both TDR and STDR, but a significant positive effect on LTDR, and therefore, Hypotheses H-2b and H-2c are confirmed, but not H-2a. These results suggest that higher levels of tangible assets lead to greater long-term leverage but lower short-term leverage. The tangibility of assets shows a significant negative effect on total debt leverage rather than a positive effect as hypothesized in H-2a. This is possibly due to short-term debt dominating the total debt financial resources for SMEs in Taiwan, and hence TANG would carry the same sign, i.e., negative, for both TDR and STDR. Tangibility (TANG) exerts a positive effect on long-term debt leverage during both prior and post crisis periods implying that the tangible assets provide solid collateral for mortgages; lenders in Taiwan take them as concrete assurance for securing long-term loans. Panel B reveals that the relationships of TANG with TDR, LTDR, and STDR remain the same in the stress period (2008-10) as in the normal period (2004-06).

Furthermore, Panel A reveals that growth opportunities (INTANG) exercise significant negative effects on both TDR and STDR, but a non-significant effect on LTDR. Hypothesis H-3a is supported--growth opportunities have a negative relationship with total debt leverage. Neither H-3b nor H-3c is supported. INTANG presents a significant negative factor on the short-debt ratio (STDR) rather than a positive relationship with STDR which can be reasonably explained by SMEs in Taiwan

usually having relatively lower levels of intangible assets than larger firms; SMEs can afford purchasing more patents and other intangible assets only when they have enough working capital (WC) as evidenced by the correlation coefficient of 0.055 between INTANG and WC in Table 2. But when they have enough working capital, they are less likely to finance through debt, showing a statistically significant negative relationship between INTANG and STDR. During the period of 2008-2010, INTAG remained a significant negative factor with STDR and a non-significant factor with LTDR but changed from a significant negative factor to a non-significant factor with TDR, indicating that growth opportunities became a less important determinant for general debt decisions for the SMEs in Taiwan under financial stress conditions.

During the period of 2004-2006, profitability (ROA) applies a significant negative effect on all three types of capital structures--total debt leverage (TDR), long-term leverage (LTDR), and short-term leverage (STDR)--confirming both Hypotheses H-4a (Profitability has a negative relationship with total debt leverage) and H-4b (Profitability has a negative relationship with short-debt leverage) with no hypothesis solely addressing long-term leverage. During the period 2008-10, ROA remains a significant negative factor on TDR, LTDR, and STDR, implying that profitability is a critical determinant for debt decisions for SMEs in Taiwan, no matter whether about total debts, long-term debts, or short-term debts and no matter whether during normal or stress periods. Table 4 reveals that tax shields (TAX) presented non-significant effects on all three types of capital structures during the normal economic period (2004-2006) but became a significant negative factor for both the short-term debt ratio (STDR) and total debt ratio (TDR) during 2008-2010. This implies that to avoid possible bankruptcy or breach of contracts during financial stress, SMEs in Taiwan adopt a more conservative financial policy in regards to higher tax rates.

Analyses of the two secondary variables effects demonstrate that depreciation expense (DEPR) is not a significant factor for the SME managers to determine their firms' capital structures for TDR, LTDR, and STDR during 2004-2006. Working capital (WC) reveals a significant negative effect on both STDR and TDR, but not on LTDR during 2004-2006. During 2008-2010, depreciation expense (DEPR) remains a non-significant determinant for all three types of capital structures, while working capital (WC) remains a significant negative factor for both TDR and STDR, but also becomes a significant negative factor for long-term debt leverage (LTDR), implying that working capital becomes a more decisive determinant for long-term debt

financing for the SMEs in Taiwan under financial stress.

Noteworthy is the SMEs in Taiwan reliance on the short-term debt as opposed to long-term debt in financing their assets and operations. Firm size (SIZE) has a significant positive relationship with TDR, LTDR and STDR both before and after the crisis, implying that larger firm size provides lower bankruptcy costs for the SMEs receiving loan approvals It also suggests that the bankruptcy cost effect overrides the political cost effect (firm size is also a proxy for political cost, constraining firm's growth to avoid political attention) for the SMEs in Taiwan when determining their debt structure and operations. Profitability (ROA) is a significant negative factor for total debt, long-term debt and short-term debt financing for SMEs in Taiwan during both normal and stress periods, implying that profit is a critical determinant for all three types of capital decisions. It also implies that when the profit of SMEs is higher, the SMEs are able to generate larger internal funds and hence depend less on external debt. In addition, tax shields (TAX, effective tax rate) were found to not exert a significant impact on all three debt decisions prior to the crisis, but they become a significant negative factor for both total debt and short-term debt leverages after the crisis. The above results are useful to governments and banking authorities when they formulate regulations and policies. Less restrictive regulations, preferential tax rates, and higher availability of funds to the SMEs should become effective measures for rescuing the SMEs from financial crisis.

5. Conclusion

The capital structure choice is one of the most important decisions faced by corporate management (Degryse, 2010). Early empirical studies addressing capital structure mostly examined large publicly listed firms which often have multiple types of securities traded in the capital markets. Fewer articles focused on the small and medium-sized firms (SMEs) (Frank and Goyal, 2008). Usually, the SMEs encounter greater difficulty in obtaining funds and have more limited financing alternatives than the large firms. The financing troubles facing the SMEs worsened when the subprime mortgage crisis emerged in the U.S. in 2007 releasing large scale financial chaos in the U.S., Taiwan, and many other countries in the world.

This study finds that during the normal period of time (2004-06) firm size has a positive impact on all three types of capital structures (total debt, long-term debt and short-term financial leverages) for SMEs in Taiwan. ROA has a negative impact on all

three types of capital structures. The tangibility of assets is a significant negative factor on both total debt and short-debt ratios, but reveals a positive effect on long-term debt leverage. Furthermore, growth opportunities have a negative effect on both total debt and short-term-debt finance decisions, while tax shields and depreciation expense exert no effect on any of the three types of the capital structures for the SMEs in Taiwan. Working capital reveals a negative impact on total debt and short-debt decisions. However, after the financial crisis (2008-10), the original effects of firm size, tangibility, ROA, and depreciation expense on the three types capital structures of SMEs in Taiwan remain the same as those prior the financial crisis. However, growth opportunity transforms from a significant to a non-significant negative factor on total debt leverage, while tax shield turns into a significant negative factor on both total debt and short-term debt leverages from a non-significant factor. This study also finds that the SMEs in Taiwan rely more on the short-term debt than long-term debt in financing their assets and operations. The above findings are useful to governments and banking authorities when they formulate regulations and policies. Less restrictive regulations, preferential tax rate, and higher availability of funds to the SMEs should become effective measures for rescuing the SMES from financial crisis.

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