

CAPITAL STRUCTURE AND CORPORATE PERFORMANCE: EVIDENCE FROM THAILAND

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***Abstract:** The purpose of this paper is to examine the relationship between capital structure and financial performance of the listed companies on the Stock Exchange of Thailand (SET). Fixed effect and random effect panel regression model is applied to the data covering the period 2009-2011. The empirical evidence shows that the firm's capital structure is a significant determinant of corporate performance. Specifically, SDTA has a negative and significant impact on the performance measure ROA and ROE. The significance and negative effects of SDTA on a firm's performance ROA supports the argument that short-term debt decreases a firm's performance. Moreover, LDTA, TDTA and TDTE are significantly negatively related to ROE. These results show that higher level of leverage lead to lower ROE. In addition, the results found the positive impact of 'Agro & Food Industry' sector to corporate performance in Thailand. It may also indicate particular sector is more profitable than others.*

***Keywords:** Capital Structure; Corporate Performance; Agency Theory; Panel Regression Analysis*

***JEL Classification Code:** G320; C330*

1. INTRODUCTION

The capital structure of a company is a combination of debt and shareholder equities. The main problem in determining the capital structure is, considering the differences between equity and debt, how much debt and how much equity the company should have that is not subject to bankruptcy risk and less financing cost to pay (Shahveisi, Navid, Najafi, & Hosseini, 2012). In general, a company can choose among many alternative capital structures. It can issue a large amount of debt or very little debt; however, it will attempt to find the particular combination that maximizes its overall market value (Abor, 2005).

Capital structure and its effect on firm performance has long been the subject of considerable debate. Its importance derives from the fact that capital structure is closely related to the ability of firms to fulfill the needs of various stakeholders. The last century

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has witnessed a continuous developing of new theories on the optimal debt to equity ratio.

There have been empirical studies exploring the relationship between corporate capital structure and its performance in various countries, both in emerging and developed countries—for example, Australia (Cassar & Holmes, 2003; Skopljak & Luo, 2012), the U.S. (Berger & Patti, 2002), Nigeria (Iorpev & Kwanum, 2012; Muritala, 2012; Babalola, 2012), Jordan (Tian & Zeitun, 2007), India (Majumdar & Chhibber, 1999), Bangladesh (Chowdhury & Chowdhury, 2010), Iran (Salehi & Biglar, 2009; Shahveisi et al., 2012), Pakistan (Khan, 2012), Egypt (Ebaid, 2009), Sri Lanka (San & Heng, 2011; Manawaduge, Zoysa, Chowdhury, & Chandarakumara, 2011) and Malaysia (Zuraidah Ahmad, Abdullah, & Roslan, 2012).

The objective of the current paper is to examine the relationship between capital structure and corporate performance in Thailand. In Thailand, to the best of my knowledge, there were very few studies focused on exploring the relationship between corporate capital structure and its performance in Thailand. Those studies include Wiwattanakantang (1999; 2000). However, these two studies focused on investigating the determinants of the Thai firms' capital structure using the tax-based theory, the signaling theory, and the agency theory, which are different from the main focus of the current study.

Wiwattanakantang (1999) presented empirical evidence on the determinants of the capital structure of non-financial firms in 1996. The study found that taxes, bankruptcy costs, agency costs and information costs are important factors in the Thai firm's financing decisions. Non-debt tax shields and profitability have negative effects on the debt-equity ratio. The Thai corporate leverage ratio is positively related to firms' size and tangibility. The estimates of measure for firm risk and variation in sales are insignificant. The author discussed that the tax effect, the signaling effect and the agency costs play a role in financing decisions. Ownership structure also effects financial policy. Family-owned firms have significantly higher debt levels. Only in single-family-owned firms do managerial shareholdings have a consistently positive influence on firm leverage. The author presented that large shareholders negatively affect the debt ratio, implying that they may monitor the management.

In addition, Wiwattanakantang (2000) investigated the ownership and capital structure of Thai firms. The study examines the influence of the ownership structure and corporate governance on the capital structure policy and performance of Thai firms. The empirical results indicated that taxes, bankruptcy costs, agency costs and information costs are important factors in the Thai firms' financing decisions. Non-debt tax shields, profitability and investment opportunities have negative effects on the debt-equity ratio. The results were consistent with the tax-based model and the pecking order theory.

The results of this study contribute to the finance literature in several ways. First, the study adds to the literature by showing that capital structure is significantly related to corporate performance.

Second, the effect of capital structure on the profitability of listed firms in Thailand is a scientific area that has not yet been thoroughly explored in Thai finance literature. Issues such as how the listed Thai firms finance their projects, how much they use debt and equity financing, and the relationship between corporate financial performance and the existing debt-equity choice are not yet well understood. A better understanding of the issues at hand requires a look at the concept of capital structure and its effect on firm profitability. In practice, firm managers who are able to identify the optimal capital structure are rewarded by minimizing a firm's cost of finance, thereby maximizing the firm's revenue. If a firm's capital structure influences its firm's performance, then it is reasonable to expect that the firm's capital structure would affect the firm's health and its likelihood of default. Finally, the literature in emerging markets also benefits from this study. Emerging markets are typically characterized by severe information asymmetry, more acute agency costs, more corruption, and less developed financial markets (Udomsirikul, Jumreornvong, & Jiraporn, 2011). The results of this study show that, even in one such emerging market, the impact of capital structure on corporate performance is significant. In short, the issues regarding capital structure and firm performance are important for both academics and practitioners.

The remainder of this study proceeds as follows. Section 2 discusses the background and literature review. Section 3 develops the theory and hypotheses. Then, Section 4 presents the data and econometric methodology, followed by Section 5, which displays the empirical results. Finally, Section 6 presents the discussion and conclusions.

2. BACKGROUND AND LITERATURE REVIEW

2.1. Thai Context

This paper focuses on examining the effects of listed companies' capital structure and company performance in Thailand. The reason for choosing Thailand as the case for this topic is its uniqueness in several aspects, which are discussed below.

First, Thai firms obtain capital through commercial banks to a much larger extent than do American firms. Indeed, many corporations in Thailand constitute part of a large conglomerate that owns its own commercial banks and financial institutions, making it easier for these firms to obtain financing through banks than through outside capital markets. As bank loans constitute a crucial source of funding, Thai firms exhibit less reliance on external financing than their U.S. counterparts (Udomsirikul *et al.*, 2011). This phenomenon may affect the optimal capital structure of the firm.

Second, due to the high volatility of domestic interest rates, Thai banks and financial institutions provide primarily short- or medium-term loans. Very few financial institutions provide loans with maturity longer than ten years (Wiwattanakantang, 1999). Thus, this banking credit policy could also have an impact on the capital structure of the borrowing companies and could also force these firms to choose a less than

optimal capital structure, which could make them vulnerable in the short term to an increase in the interest rate (Udomsirikul *et al.*, 2011).

Third, the corporate bond market in Thailand remains underdeveloped. Thai companies were not allowed to issue bonds prior to 1992 (Wiwattanakantang, 1999). Although the Thai bond market has made serious strides in the past few years, it remains relatively unsophisticated and illiquid when compared to the U.S. (Udomsirikul *et al.*, 2011). The underdevelopment of the Thai bond market may make Thai firms prefer equity over public debt and hence may influencing the optimal level of debt used in the company.

Therefore, these unique characteristics offer the researcher a new insight into the study on the effects of capital structure on firm performance.

2.2. Capital structure and corporate performance literature

Capital structure management involves the selection of debt and equity securities in a way that will maximize the value of the firm (Sheikh & Wang, 2013). It has been argued that profitable firms are less likely to depend on debt in their capital structure than less profitable ones. It has also been argued that firms with a high growth rate have a high debt to equity ratio. It has also been found that firms with a high growth rate have a high debt to equity ratio. If a company's capital structure influences the company's performance, then it is reasonable to expect that the capital structure of a company could affect the company's likelihood of financial distress (Tian & Zeitun, 2007).

Since the argument by Jensen and Meckling (1976) regarding the possibility of capital structure influence on firm performance, several researchers have followed this extension and have conducted numerous studies that aim to examine the relationship between financial leverage and firm performance over the last decades. However, empirical evidence regarding this relationship is contradictory and mixed. While a positive relationship between leverage level and firm performance had been documented in some studies—for example, Nerlove(1968), Taub (1975), Champion (1999) and Hadlock & James (2002)—other studies document a negative relationship between leverage level and firm performance—for example, Fama & French (1998), Tian & Zeitun (2007) and Muritala (2012).

However, some empirical studies have shown no significant relationship between capital structure and firm performance. For instance, Krishnan & Moyer (1997) investigated the impact of corporate performance on capital structure of large enterprises from four emerging market economies in Asia. The study used 81 corporations from Hong Kong, Malaysia, Singapore and Korea and found that both financial performance and capital structure are influenced by the country of origin. They suggested that leverage itself does not seem to affect corporate performance. Similarly, Phillips & Sipahioglu (2004) explored the relationship between capital structure and corporate performance with 43 UK listed hotel companies. Empirical

analysis revealed no significant relationship between the level of debt found in the capital structure and financial performance. Similarly, Ebaid (2009) concluded that the capital structure choice has a weak-to-no impact on firm performance.

Recently, Rajendran & Nimalthasan (2013) examined the relationship between capital structure and firm performance in Sri Lanka. The data were taken from a sample of 25 manufacturing firms covering the period 2008-2012. The firm performance measurements include gross profit, net profit, ROE and ROA, while the debt-equity ratio and the debt-assets ratio were used as the measurement of capital structure. Regression models were estimated and showed that gross profit, net profit, ROE and ROA were not significantly related to the debt-equity ratio, whereas gross profit margin and ROE were significantly negatively related to the debt-assets ratio.

Sheikh & Wang (2013) investigated whether capital structure affects the performance of non-financial firms in Pakistan. Pooled ordinary least squares (OLS), fixed effects and random effects models were used to investigate the impact of capital structure on the performance of non-financial firms listed on the Karachi Stock Exchange Pakistan during 2004-2009. The empirical results indicated that all measures of capital structure, including the total debt ratio, long-term debt ratio and short-term debt ratio, were negatively related to ROA in all regressions. Moreover, the total debt ratio and long-term debt ratio are negatively related to the market-to-book ratio under the pooled OLS model, whereas these measures are positively related to the market-to-book ratio under the fixed effects model. The short-term debt ratio is positively related to the market-to-book ratio in all regressions; however, the relationship is found insignificant. A negative relationship between capital structure and performance indicates that agency issues may lead firms to use higher than appropriate levels of debt in their capital structure.

According to Liu and Ning (2009), the results of the empirical research on the relationship between company performance and the debt ratio can be basically divided into two sorts: 1) The debt ratio and company performance showed a negative correlation. Generally, when the profitability of the enterprise is strong, the enterprise can keep more surpluses and will have fewer debts. And when the enterprise is in a loss, because it cannot fulfill the condition of equity financing, it has to borrow large amounts of short-term debt to fulfill the demand for the capital. Thus, the negative correlation between profitability and the debt ratio can be easily understood and accepted. 2) The debt ratio and company performance showed a positive correlation. Taking net profit/ primary business income and net assets yield as explanatory variables and combining the empirical results with the balance theory, we can obtain the result that a listed company with strong profitability has relatively low financial risk; thus, the enterprise can select the high capital structure ratio, and profitability and debt ratio present a positive correlation relationship.

After more than fifty years of studies, economists have not reached an agreement on how and to what extent the capital structure of a firm impact its value, performance

and governance. However, the studies and empirical findings of the last decades have at least demonstrated that capital structure has greater importance than in the simple Modigliani-Miller model.

3. THEORY AND HYPOTHESES DEVELOPMENT

A number of theories have been advanced for explaining the capital structure of companies. The seminal work by Modigliani & Miller (1958) provided the broadly known theory of 'capital structure irrelevance', where financial leverage does not affect the firm's market value. However, this theory was based on very restrictive assumptions, which do not exist in the real world. These assumptions include perfect capital markets, homogenous expectations, no taxes and no transaction costs. The presence of bankruptcy costs and favorable tax treatment of interest payments lead to the notion of an "optimal" capital structure that maximizes the value of the firm or minimizes its total cost of capital (Abor, 2005).

Many researchers introduce additional rationalizations for this proposition and its underlining assumptions showing that capital structure affects a firm's value and performance. This is the case with Modigliani & Miller (1963), who reviewed their earlier study by incorporating tax benefits as determinants of the capital structure of firms. The key feature of taxation is that interest is a tax-deductible expense. A firm that pays taxes receives a partially offsetting interest "tax-shield" in the form of lower taxes paid. Therefore, as Modigliani and Miller (1963) propose, a firm should use as much debt capital as possible to maximize the firm's value. Miller and Modigliani (1963) and Miller (1977) addressed the issue more specifically, showing that under some conditions, the optimal capital structure can be complete debt finance due to the preferential treatment of debt relative to equity in the tax code.

Other theories that have been advanced to explain the capital structure of firms include bankruptcy costs (Titman, 1984), agency theory (Jensen & Meckling, 1976; C. Jensen & Meckling, 1976), and the pecking order theory (Myers & Majluf, 1984). In summary, there is no universal theory of debt-equity choice. Different views have been put forward regarding the financing choice (Abor, 2005).

This research argues that the debt level of the company in terms of three measurements—short-term debt, long-term debt and total debt to total assets—affects its performance. Furthermore, the researcher used more than one proxy for leverage because different hypotheses for leverage were developed to investigate their effect on corporate performance. For example, the SDTA and LDTA are used to investigate the effect of short-term and long-term debt on a firm's performance. The proxy of TDTE was used in the study to validate our result. The research hypotheses are set as follows:

Research Hypothesis #1: A company's short-term debt to total assets ratio significantly influences its performance.

Research Hypothesis #2: A company's long-term debt to total assets ratio significantly influences its performance.

Research Hypothesis #3: A company's total debt to total assets ratio significantly influences its performance.

Research Hypothesis #4: A company's total debt to total equity ratio significantly influences its performance.

Growth opportunities are measured by growth of sales. It is expected that companies with high growth opportunities have high performance ratios, as growth firms are able to generate profit from investment. Thus, growth opportunities are expected to positively affect a firm's performance. Thus, Hypothesis 5 can be stated as follows:

Research Hypothesis #5: A company's growth opportunities significantly increase corporate performance.

A company's size is measured by the log of assets. The company's size is hypothesized to be positively related to the company's performance, as bankruptcy costs decrease with size. Thus, a company's size is expected to have a positive influence on a company's performance. Based on this discussion, Hypothesis 6 can be stated as follows:

Research Hypothesis #6: A company's size significantly influences corporate performance.

This paper also includes industry dummies to control for possible industry variation in performance. To control for the effect of industrial sectors on a firm's performance, six dummy variables are used: Sector 1 (Agro & Food Industry), Sector 2 (Resources), Sector 3 (Technology), Sector 4 (Services), Sector 5 (Industrials), Sector 6 (Consumer Products) and Sector 7 (Property & Construction). The dummy variable takes the value 1 if the firm is in that sector; otherwise, it takes the value 0. Consequently, Hypothesis 7 could be formulated as:

Research Hypothesis #7: A company's industry sector significantly influences corporate performance.

4. DATA AND ECONOMETRIC METHODOLOGY

This study provides empirical evidence on the relationship between capital structure and corporate performance for firms listed on the Stock Exchange of Thailand (SET). Specifically, the study will explore whether capital structure does or does not affect corporate performance. The analysis is conducted on a sample of all listed companies on the SET over a three-year period. The financial sector is excluded from the analysis because its characteristics are different.

The panel data included 370 companies listed on SET with completed data covering the period 2009-2011. The sample altogether consists of 1,110 observations. Panel data

allows the researcher to control for variables that change over time but not across entities. This accounts for individual heterogeneity.

The measurement of performance is dependent upon the information introduced in the measurement system and the instruments employed. The classical indicators used in financial analysis to measure performance have been return on investment, leverage, capital efficiency, liquidity, cash flow, inventory turnover and receivables turnover ratio. In addition to these factors, the so-called modern value creation indicators are: 1) Accounting indicators: net profit or earnings per share; operating profit or EBIDTA, Return On Assets (ROA) and Return On Equity (ROE); 2) Hybrid indicators (accounting and financial): Economic Value Added (EVA), Cash Flow Return on Investment (CFROI); 3) Financial indicators: Net Present Value (NPV); and 4) Market indicators: Market Value Added (MVA), total shareholder return. The choice of alternatives for ascertaining performance may be influenced by the firm's objective (Tudose, 2012).

Variables used in the study include profitability and leverage ratios. The paper uses two measures of corporate performance or profitability ratios—ROE and ROA—which are employed as measures representing accounting performance. The leverage ratios include short-term debt to total assets, long-term debt to total assets total debt to total assets and total debt to total equity. The company's size, company's sales growth and industry sector are also included as control variables. The data will be obtained from the SET Smart Database.

The variables used and the definitions are shown in Table 1.

Table 1
Definition of Variables and Explanation

<i>Variables</i>	<i>Definition and explanation</i>
Company's performance measurements:	
ROE	Return on Equity—The first measurement of corporate performance, which is computed by net profit/equity
ROA	Return on Assets—The second measurement of corporate performance, which is computed by net profit/total assets
Leverage ratios	
SDTA	Short-term debt to total assets ratio—The first measurement of the company's leverage
LDTA	Long-term debt to total assets ratio—The second measurement of the company's leverage
TDTA	Total debt to total assets ratio—The third measurement of the company's leverage
TDTE	Total debt to total equity ratio—The fourth measurement of the company's leverage
Control variables	
SIZE	Company size measured by the natural log of the total assets of the company
GRO	Growth opportunities measured by the company's sales growth
IND	Company's industry sector—A total of six dummy variables, IND1-IND6, are used as the proxies for seven industry sectors

The relationship between capital structure and listed companies' performance will be investigated by using panel regression analysis. Panel data are employed covering the period from 2009 to 2011. Panel data involves the pooling of observations on a cross-section of units over several time periods and provides results that are simply not detectable in pure cross-sections or pure time-series studies. A general model for panel data that allows the researcher to estimate panel data with great flexibility and formulate the differences in the behavior of the cross-section elements is adopted (Abor, 2005).

The estimation methods will consist of descriptive statistics, correlations analysis, and fixed effects and random effects panel regressions analysis. This paper focuses on two techniques use to analyze panel data—namely, fixed effects and random effects models. One important assumption of the fixed effects model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different; therefore, the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated, then fixed effects is not suitable because inferences may not be correct and the researcher needs to model that relationship using random effects model; this is the main rationale for the Hausman test. This paper run a Hausman test where the null hypothesis is that the preferred model is the random effects model over the alternative—the fixed effects model. It basically tests whether the unique errors are correlated with the regressors; the null hypothesis is that they are not.

This paper will estimate the following equations to test the hypotheses that a firm's capital structure influences its performance. The dependent variable is the company's performance measurements. The independent variables are represented by leverage, corporate sales growth, company size and industry sector.

The empirical regression models to be estimated are as follows:

$$PER_{i,t} = b_0 + b_1 LEV_{i,t} + b_2 GRO_{i,t} + b_3 SIZE_{i,t} + b_4 IND_i + e_{i,t} \quad (1)$$

where:

$PER_{i,t}$ is corporate performance measured alternatively by ROA and ROE for company i in time t .

$LEV_{i,t}$ is the financial leverage for company i in time t . Four measurements of leverage include short-term debt to total assets ratio, long-term debt to total assets ratio, total debt to total assets ratio and total debt to total equity ratio.

$GRO_{i,t}$ is the sales growth for company i in time t .

$SIZE_{i,t}$ is company size measured by the natural log of assets for company i in time t .

IND_i is the industry sector for company i .

$e_{i,t}$ is the error term.

5. EMPIRICAL RESULTS

5.1. Descriptive statistics

Table 2 reports descriptive statistics of the variables used in the study. The average return to assets for the sample as a whole is 7.84%, while the average return to equity is approximately 6.94%. During the time period 2009-2011, the average total debt to total assets for the sample as a whole is approximately 43%, while the average short-term debt to total assets and long-debt to total assets are 31% and 12%, respectively. The results show that Thai listed companies use short-term debt as a source of funds rather than long-term debt.

Table 2
Descriptive Statistics of the Variables, 2009-2011

Variable	Mean	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis	Jarque-Bera	Probability
ROA	7.84	10.39	-62.91	57.29	-0.39	9.13	1,764.84	0.00
ROE	6.94	34.55	-597.77	312.67	-7.49	127.77	730,365.30	0.00
SDTA	0.31	0.20	0.00	0.99	0.72	2.86	95.81	0.00
LDTA	0.12	0.14	0.00	0.86	1.51	5.16	637.50	0.00
TDTA	0.43	0.22	0.00	1.07	0.06	2.27	25.21	0.00
SIZE	8.30	1.48	4.98	14.15	0.67	3.43	92.52	0.00
GRO	29.05	392.57	-98.61	10,791.45	22.49	564.90	14,696,057.00	0.00

Note: ROA = Return on assets, ROE = Return on equity, SDTA = Short-term debt to total assets, LDTA = Long-term debt to total assets, TDTA = Total debt to total assets, SIZE = Firm size and GRO = Firm growth.

5.2. Correlation analysis

The correlation matrix for the variables is reported in Table 3 to examine the correlation between the explanatory variables. The results show that there is a negative relationship between growth and size, while size has a positive relationship with all leverage ratios except short-term debt to total asset, which is negative. This implies that larger companies tend to have a higher leverage ratio with lower growth opportunities. It also implies that small firms have high growth opportunities which is consistent with Myers (1977).

Table 3
Correlation Matrix of the Explanatory Variables, 2009-2011

	SDTA	LDTA	TDTA	SIZE	GRO
SDTA	1				
LDTA	-0.19704	1			
TDTA	0.76524	0.479961	1		
SIZE	-0.02905	0.465782	0.280025	1	
GRO	0.045156	0.003858	0.041812	-0.01539	1

Note: ROA = Return on assets, ROE = Return on equity, SDTA = Short-term debt to total assets, LDTA = Long-term debt to total assets, TDTA = Total debt to total assets, SIZE = Firm size and GRO = Firm growth.

5.3. Fixed and random effects panel regressions analysis

The results of the estimation of the panel data models with each of the performance measures and for the full sample of observations for the period 2009-2011 are displayed in Tables 4 to 8.

For Hypotheses 1 to 4, the firm's capital structure is expected to influence its performance. Four capital structure variables are used: SDTA, LDTA, TDTA and TDTE. From the regression results in Table 4, Table 5, Table 6 and Table 7, as expected, the coefficients of those variables are negatively related to the accounting performance measure ROA and ROE. The results show that SDTA significantly negatively affects corporate performance measure ROA and ROE. Moreover, LDTA, TDTA and TDTE are significantly negatively related to ROE at the 1 percent significance level. These results show that a higher level of leverage leads to lower ROE.

According to Hypothesis 1, which states that a company's short term debt to total assets ratio significantly influences its performance, the results show that SDTA is significantly negatively related to both ROA and ROE at the 1 percent significance level. Therefore, this study accepts the hypothesis that short-term debt decreases corporate performance ROA and ROE. The high level of significance for SDTA reflects the important impact of short-term debt on firm performance. The results are shown in Table 4.

Table 4
Estimation Results for Panel Data Models Using SDTA

	ROA	ROE
Constant	-29.0051 (-3.3927)***	-43.2977 (-0.9972)
SDTA	-18.8419 (-6.2762)***	-94.2651 (-6.1826)***
SIZE	5.1298 (4.9567)***	9.5170 (1.8107)*
GRO	0.0007 (1.2806)	0.0017 (0.6046)
No. of Observations	1,110	1,110
R-Square	0.7714	0.4662
Jarque-Bera TestP-value	2,884.2780 (<0.0001)***	470592.4 (<0.0001)***
Hausman Test	17.1379 (0.0007)***	16.9858 (0.0007)***

Note: ***Significant at the 1% level, ROA = Return on assets, ROE = Return on equity, SDTA = Short-term debt to total assets, SIZE = Firm size and GRO = Firm growth.

Furthermore, it may provide support for the proposition that due to agency conflicts, companies over-leveraged themselves, thus negatively affecting their performance. The results are consistent with the findings of previous studies such as Krishnan & Moyer (1997), Gleason, Mathur and Mathur (2000), Tzelepis and Skuras

(2004), Tian & Zeitun (2007), among others. Additionally, LDTA and TDTE have a negative and insignificant impact on a firm's profitability measure (ROA). However, the negative and significant coefficient of LDTA does not support the argument by Brick & Ravid (1985) that long-term debt increases a firm's value, which could be due to the low ratio of long-term debt in the capital structure of Thai companies.

Hypothesis 2 predicts that a company's long-term debt to total assets ratio significantly influences its performance. Specifically, firms with high short-term debt in their capital structure tend to have lower performance; thus, short-term debt decreases a firm's performance. From the panel regression results in Table 5, as predicted, the coefficient of LDTA is negative and significantly different from zero. However, while LDTA is found to have a negative and significant effect on ROE, it also found to have negative but insignificant effects on ROA. These findings indicate that the LDTA ratio negatively affects the accounting performance measure ROE.

Table 5
Estimation Results for Panel Data Models Using LDTA

	ROA	ROE (Random effect model)
Constant	-32.9575 (-3.5692)***	-30.2864 (-4.3975)***
LDTA	-5.1139 (-1.2098)	-24.6976 (-2.8317)***
SIZE	4.9870 (4.4001)***	4.8340 (5.5700)***
GRO	0.0008 (1.4442)	0.0023 (0.8908)
No. of Observations	1,110	1,110
R-Square	0.7596	0.0279
Jarque-Bera TestP-value	4016.6650 (<0001)***	803412.2000 (<0.0001)***
Hausman Test	16.4390 (0.0009)***	1.3529 (0.7166)

Note: ***Significant at the 1% level. ROA = Return on assets, ROE = Return on equity, LDTA = Long-term debt to total assets, SIZE = Firm size and GRO = Firm growth.

According to Table 6, regarding Hypothesis 3, the TDTA ratio is found to be significant and negatively related to the market performance measures ROA and ROE. The TDTA coefficient in the model indicates that higher levels of total debt to total assets in the capital structure are associated with lower levels of market performance for both ROA and ROE.

Furthermore, it can be seen from Table 7 that the TDTE coefficient in the panel regression model has a negative and significant coefficient with ROE, indicating that higher levels of total debt to equity in the capital structure are associated with lower levels of market performance (ROE). This result implies that Hypothesis 4 holds. However, TDTE is not significantly related to ROA.

Table 6
Estimation Results for Panel Data Models Using TDTA

	ROA	ROE
Constant	-49.6253 (-5.7243)***	-138.4511 (-3.1187)***
TDTA	-30.3503 (-8.7167)***	-139.7966 (-7.8407)***
SIZE	8.4835 (7.6715)***	24.7104 (4.3636)***
GRO	0.0009 (1.6313)	0.0026 (0.9127)
No. of Observations	1,110	1,110
R-Square	0.7817	0.4818
Jarque-Bera TestP-value	2744.210 (<0.0001)***	499843.9 (<0.0001)***
Hausman Test	37.1859 (<0.0001)***	34.1847 (<0.0001)***

Note: ***Significant at the 1% level. ROA = Return on assets, ROE = Return on equity, TDTA = Total debt to total assets, SIZE = Firm size and GRO = Firm growth.

Table 7
Estimation Results for Panel Data Models Using TDTE

	ROA	ROE (Random effect model)
Constant	-29.4494 (-3.3614)***	-19.2248 (-3.1459)***
TDTE	-0.0582 (-1.5054)	-1.9693 (-13.9088)***
SIZE	4.5007 (4.2642)***	3.5257 (4.8722)***
GRO	0.0007 (1.3698)	0.0021 (0.8864)
No. of Observations	1,110	1,110
R-Square	0.7599	0.1664
Jarque-Bera TestP-value	3949.2710 (<0.0001)***	708966.5000 (<0.0001)***
Hausman Test	20.7717 (0.0001)***	1.6860 (0.6400)

Note: ***Significant at the 1% level. ROA = Return on assets, ROE = Return on equity, TDTE = Total debt to total equity, SIZE = Firm size and GRO = Firm growth.

Considering the relationship between corporate performance and its growth, as mentioned in Hypothesis 5, the firm's growth opportunity is expected to influence its performance. From the panel regression results in Table 4 to Table 7, growth is found to have positive and insignificant effects on the performance measure ROA and ROE. Therefore, this study does not support the hypotheses that growth opportunity increases corporate performance. This result is not consistent with Tian & Zeitun (2007), who reported that growth opportunity increases corporate performance ROA.

Hypothesis 6 predicts that firm size significantly influences corporate performance. It can be seen from Table 4 to Table 7 that the firm size is significantly positively related to corporate performance for both ROA and ROE. The significance of firm size indicates that large firms earn higher returns compared to smaller firms, presumably as a result of diversification of investment and economies of scale. This result is consistent with previous findings including Gleason *et al.* (2000) and Tian & Zeitun (2007). The results indicate that a firm's size is an important determinant of corporate performance.

The research further investigates the effects of the industrial sector on corporate performance and whether the significance of a firm's capital structure will be affected as the industrial dummy variables are added to the model. Hypothesis 7 proposes that a company's industry sector significantly influences corporate performance. Table 8 shows that the industry dummy variables for sector 1 (Agro & Food Industry) is positively and significantly related to the accounting measures of performance ROA

Table 8
Estimation Results for Panel Data Models Including Dummy Variables for Industrial Sectors

	TDTA		TDTE	
	ROA	ROE	ROA	ROE
Constant	-1.8382 (-0.9541)	-20.3476 (-3.0829)***	-4.5590 (-2.3175)***	-22.3189 (-3.6060)***
Leverage	-14.4858 (-10.0635)***	-38.5996 (-7.8279)***	-0.2110 (-4.7472)***	-1.9097 (-13.6534)***
SIZE	1.8539 (8.7319)***	5.1737 (7.1135)***	1.3562 (6.3241)***	3.6450 (5.4022)***
GRO	0.0007 (1.0494)	0.0032 (1.2742)	0.0005 (0.6325)	0.0024 (0.9914)
IND1	4.5238 (4.0596)***	10.2675 (2.6897)***	6.2730 (5.5285)***	12.5799 (3.5237)***
IND2	1.1802 (0.9210)	1.2102 (0.2757)	2.0375 (1.5415)	1.9199 (0.4617)
IND3	0.0812 (0.0717)	-1.1438 (-0.2948)	-0.1472 (-0.1256)	-2.5753 (-0.6985)
IND4	-0.2547 (-0.2838)	-0.1585 (-0.0516)	0.9169 (0.9987)	1.0107 (0.3499)
IND5	0.2089 (0.2235)	0.5426 (0.1695)	1.4545 (1.5222)	1.5712 (0.5226)
IND6	-0.8874 (-0.7646)	-3.5901 (-0.9029)	1.8246 (1.5678)	2.4621 (0.6724)
No. of Observations	1,110	1,110	1,110	1,110
R-Square	0.1467	0.0937	0.0869	0.1818

Note: ***Significant at the 1% level. ROA = Return on assets, ROE = Return on equity, TDTA = Total debt to total assets, TDTE = Total debt to total equity, SIZE = Firm size, GRO = Firm growth and IND1 = Agro & food industry sector dummy variable, IND2 = Resources sector dummy variable, IND3 = Technology sector dummy variable, IND 4 = Services sector dummy variable, IND5 = Industrials sector dummy variable, and IND6 = Consumer products sector dummy variable. Reference sector is property & construction.

and ROE using TDTA and TDTE as the measures of capital structure. The positive and significant impacts of this industrial dummy variable indicate that a higher level of investment in this sector could be associated with a higher ratio of ROA and ROE.

The positive impact of sector 1 (Agro & Food Industry) indicates that investing in this sector is profitable. The main reason for this is that agriculture in Thailand is highly competitive, diversified and specialized, and its exports are very successful internationally. Recent developments in agriculture in Thailand have been achieved through a mixture of a strong and positive state role in ensuring investment in infrastructure, education and access to credit and successful private initiatives in the agribusiness sector. Additionally, it should be noted that the significance of this industrial sector may imply the presence of the industry sector.

Considering the dummy variables for Sector 3 (Technology), Sector 4 (Services) and Sector 6 (Consumer Products), the results show that the insignificance and sign of these industrial sectors changed as the performance measure changed, which may imply the presence of the industry sector.

The dummy variables for Sector 2 (Resources) and Sector 5 (Industrials) are found to have a positive but insignificant impact on the firm performance measures. The negative sign for some industries could be as a result of the negative equity value for some firms included in the analysis. Therefore, the results support the hypothesis that industrial sectors affect Thai corporate performance. As mentioned earlier in this section, the significance and sign of these industrial sectors changed as the performance measure changed, which may imply the presence of the industry sector. However, it should be noted that including industrial dummy variables in the regression increased the model robustness and accuracy.

6. DISCUSSION AND CONCLUSIONS

This paper examines the relationship between capital structure and corporate performance in Thailand in which controlling for the effects of firm growth, size and industrial sectors. There were very few studies focused on exploring the relationship between corporate capital structure and its performance in Thailand. This study tried to fill the gap in this field by investigating the effects of capital structure on corporate performance by taking Thailand as a case study. Furthermore, this paper employed different measures of capital structure such as short-term debt, long-term debt, total debt to total assets and total debt to total equity in order to investigate the effects of the debt structure on the corporate performance measures ROA and ROE. A balanced panel of 370 companies is included in this paper. Financial data from 2009-2011 are used in fixed effects and random effects panel regression analysis.

A firm's capital structure was found to have a significant and negative impact on the firm's performance measures. The results suggest that the broadly known theory of 'capital structure irrelevance' in which financial leverage does not affect the firm's market value by Modigliani & Miller (1958) may not exist in the real world. To

summarize, the firm's capital structure is a significant determinant of corporate performance. Another important finding is that SDTA has a negative and significant impact on the performance measures ROA and ROE. The significance and negative effects of SDTA on a firm's performance ROA supports the argument that short-term debt decreases a firm's performance. Moreover, LDTA, TDTA and TDTE are significantly negatively related to ROE. These results show that a higher level of leverage leads to lower ROE.

It should be noted that this study does not support the hypotheses that growth opportunity increases corporate performance. The results are not consistent with Tian & Zeitun (2007). However, consistent with Tian & Zeitun (2007), firm size was found to have a positive impact on a firm's performance, as large firms have low bankruptcy costs. In other words, bankruptcy costs increases as firm size decreases, and hence, bankruptcy costs negatively affect a firm's performance.

In addition, the results found the positive impact of the 'Agro & Food Industry' sector on corporate performance in Thailand. The result may also indicate that this particular sector is more profitable than others. Furthermore, including industrial dummy variables increased the robustness of the model.

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References

- Abor, J. (2005), The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *Journal of Risk Finance*, 6(5), 438-445.
- Babalola, Y. A. (2012), The effects of optimal capital structure on firms' performances in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences*, 3(2), 131-133.
- Berger, A. N., & Patti, E. B. d. (2002), Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry: Bank of Italy.
- Brick, I. E., & Ravid, S. A. (1985), On the relevance of debt maturity structure. *The Journal of Finance*, 40(5), 1423-1437.
- C.Jensen, M., & Meckling, W. H. (1976), Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Cassar, G., & Holmes, S. (2003), Capital structure and financing of SMEs: Australian evidence. *Accounting & Finance*, 43(2), 123-147.
- Champion, D. (1999), Finance: The joy of leverage. *Harvard Business Review*, 77(4), 19-22.
- Chowdhury, A., & Chowdhury, S. P. (2010), Impact of capital structure on firm's value: Evidence from Bangladesh. *Business and Economic Horizons*, 3(3), 111-122.
- Ebaid, I. E.-S. (2009), The impact of capital-structure choice on firm performance: Empirical evidence from Egypt. *The Journal of Risk Finance*, 10(5), 477-487.

- Fama, E. F., & French, K. R. (1998), Taxes, financing decisions, and firm value. *Journal of Finance*, *53*(3), 819-843.
- Gleason, K. C., Mathur, L. K., & Mathur, I. (2000), The Interrelationship between culture, capital structure, and performance: Evidence from European retailers. *Journal of Business Research*, *50*(2), 185-191.
- Hadlock, C. J., & James, C. M. (2002), Do banks provide financial slack? *Journal of Finance*, *57*(3), 1383-1419.
- Iorpev, L., & Kwanum, I. M. (2012), Capital structure and firm performance: Evidence from manufacturing companies in Nigeria. *International Journal of Business and Management Tomorrow*, *2*(5), 1-17.
- Jensen, M. C., & Meckling, W. H. (1976), Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305-360.
- Khan, A. G. (2012), The relationship of capital structure decisions with firm performance: A study of the engineering sector of Pakistan. *International Journal of Accounting and Financial Reporting*, *2*(1), 245-262.
- Krishnan, V. S., & Moyer, R. C. (1997), Performance, capital structure and home country: An analysis of Asian corporations. *Global Finance Journal*, *8*(1), 129-143.
- Liu, Y., & Ning, X. (2009), Empirical research of the capital structure influencing factors of electric power listed companies. *International Journal of Marketing Studies*, *1*(1), 43-49.
- Majumdar, S. K., & Chhibber, P. (1999), Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance. *Public Choice*, *98*.
- Manawaduge, A., Zoysa, A. D., Chowdhury, K., & Chandarakumara, A. (2011), Capital structure and firm performance in emerging economies: An empirical analysis of Sri Lankan firms. *Corporate Ownership & Control*, *8*(4), 253-263.
- Miller, M. H. (1977), Debt and taxes. *Journal of Finance*, *32*(2), 261-276.
- Modigliani, F., & Miller, M. H. (1958), The Cost of Capital, Corporation Finance and the Theory of Investment. *The American Economic Review*, *48*(3), 261-297.
- Modigliani, F., & Miller, M. H. (1963), Corporate income taxes and the cost of capital: A correction. *The American Economic Review*, *53*(3), 433-443.
- Muritala, T. A. (2012), An empirical analysis of capital structure on firms' performance in Nigeria. *International Journal of Advances in Management and Economics*, *1*(5), 116-124.
- Myers, S. C. (1977), Determinants of corporate borrowing. *Journal of Financial Economics*, *5*(2), 147-175.
- Myers, S. C., & Majluf, N. S. (1984), Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187-221.
- Nerlove, M. (1968), Factors affecting differences among rates of return on investments in individual common stocks. *Review of Economics and Statistics*, *50*(3), 312-331.
- Phillips, P. A., & Sipahioglu, M. A. (2004), Performance implications of capital structure: evidence from quoted UK organisations with hotel interests. *Service Industries Journal*, *24*(5), 31-51.
- Rajendran, K., & Nimalthasan, P. (2013), Capital structure and its impact on firm performance: A study on Sri Lankan listed manufacturing companies. *Merit Research Journal of Business and Management* *1*(2), 37-44.

- Salehi, M., & Biglar, K. (2009), Study of the relationship between capital structure measures and performance: Evidence from Iran. *International Journal of Business and Management Tomorrow*, 4(1), 97-103.
- San, O. T., & Heng, T. B. (2011), Capital structure and financial performance: Evidence from selected business companies in Colombo Stock Exchange Sri Lanka. *Journal of Arts, Science & Commerce*, 2(2), 171-183.
- Shahveisi, F., Navid, B. J., Najafi, Y., & Hosseini, S. A. A. (2012), The study of the relationship between the capital structure and the variables of the value-based performance assessment. *Research Journal of Finance and Accounting*, 3(7), 131-140.
- Sheikh, N. A., & Wang, Z. (2013), The impact of capital structure on performance: An empirical study of non-financial listed firms in Pakistan. *International Journal of Commerce and Management*, 23(4), 354 - 368.
- Skopljak, V., & Luo, R. H. (2012), Capital structure and firm performance in the financial sector: Evidence from Australia. *Asian Journal of Finance & Accounting*, 4(1), 278-298.
- Taub, A. J. (1975), Determinants of the firm's capital structure. *Review of Economics & Statistics*, 57(4), 410-416.
- Tian, G., & Zeitun, R. (2007), Capital structure and corporate performance: Evidence from Jordan. *Australasian Accounting Business & Finance Journal*, 1(4), 16-37.
- Titman, S. (1984), The effect of capital structure on a firm's liquidation decisions. *Journal of Financial Economics*, 13(1), 137-151.
- Tudose, M. B. (2012), Capital structure and firm performance. *Economy Transdisciplinarity Cognition*, 15(2), 76-82.
- Tzelepis, D., & Skuras, D. (2004), The effects of regional capital subsidies on firm performance: An empirical study. *Journal of Small Business and Enterprise Development*, 11 (1), 121 - 129.
- Udomsirikul, P., Jumreornvong, S., & Jiraporn, P. (2011), Liquidity and capital structure: The case of Thailand. *Journal of Multinational Financial Management*, 21(2), 106-117.
- Wiwattanakantang, Y. (1999), An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal*, 7(3-4), 371-403.
- Wiwattanakantang, Y. (2000), *The ownership structure, capital structure and performance of Thai firms*. Unpublished PhD Thesis dissertation, Hitotsubashi University.
- Zuraidah Ahmad, Abdullah, N. M. H., & Roslan, S. (2012), Capital structure effect on firms performance: Focusing on consumers and industrials sectors on Malaysian firms. *International Review of Business Research Papers*, 8(5), 137-155.