

## **Determinants of Optimal Capital Structural of ASEAN Corporations**

Tatre Jantarakolica  
Faculty of Economics, Thammasat University

Wattana Sakayachiwakit\*  
College of Innovation Management, Rajamangala University of Technology  
Rattanakosin

— *Review of* —  
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### **ABSTRACT**

Issues concerning on factors determining the capital structure of the business enterprises have long been the center of academic arguments. Empirical studies of the capital structure of the fast growing emerging financial markets like ASEAN financial markets become more interesting since the markets will be integrated as one regional financial market. This study emphasizes on factors determining the capital structure of the listed companies in five ASEAN financial markets including Indonesia, Philippines, Malaysia, Singapore, and Thailand. Panel data from 2000-2013 were collected and estimated based on trade-off theory and pecking-order theory. The results reveal significant impacts upon firm-specific factors of all companies listed in all markets. The trade-off theory and the pecking order theory seem to be fitted well for Singapore and Thailand while the pecking-order theory can be applied in Indonesia, Malaysia and Philippines.

Keywords: Capital structure, AEC, ASEAN exchange

### **I. INTRODUCTION**

ASEAN Economic Community (AEC) is an economic cooperation agreement among of ten countries located in Southeast Asia. Agreement concerning on this regional financial market, ASEAN Exchanges is the integration of seven financial markets from six countries that shall envisage the development of financial growth. These markets include Bursa Malaysia (BM), Indonesia stock exchange, the Philippines stock exchange (PSE), Singapore exchange (SGX), the stock exchange of Thailand (SET), Hochiminh stock exchange (HOSE) and Hanoi stock exchange (HNX). Every market consists of listed companies. There is Chief Financial Officer (CFO) of each company who is responsible for financial decisions which one important decision is the capital structure, which comprises the ratio of company's debt and equity. CFO may obtain financial decisions from three sources, which are i) debt, ii) equity and iii) issuing hybrid securities, to achieve the goal of the firm, which is a maximizing value of the firm. This could be done by examining the optimal capital structure to reduce

the risks from overinvesting or underinvesting. The roles of capital structure could be a tool for a firm to minimize problems arisen from agency costs.

As a result, this study investigates, firstly, the relationship between factors that influence the capital structure and debt ratio, through firm-specific factors consisting of i) firm size, ii) tangibility, iii) non-debt tax shields, iv) growth, v) profitability, vi) liquidity and vii) dividend payout, as well as impacts caused by financial crisis were studied. Furthermore, this study also investigates how these factors have an effect on the capital structure, and how the trade-off theory and the pecking order theory are used to explain behavior of each financial market. The issue of contagion has been one of the most interested topics in international finance. Contagion is an expression of the phenomenon that the crises or shock are spread to other countries which are borrowed from epidemiology where it's defined as transmitting a disease by direct or indirect contact. Hence, Financial Contagion refers to the transmission of a disease, that is, the shocks of the financial market in one country are transmitted to financial markets in other countries.

## II. REVIEW LITERATURE

The capital structure has been studied since 1958 when Modigliani and Miller introduced the M&M theory (Miller, 1958). Other theories have also been developed, for instance, Donaldson's pecking order, the static trade-off theory (Myers, 1984), the agency cost by Jensen and Meckling (Jensen & Meckling, 1976) and the signaling theory or the asymmetric information theory by Myer (Shyam-Sunder, Lakshmi & Myer, 1999). None of these theories can solely account for the capital structure. However, the trade-off theory and the pecking order theory have been simultaneously used in financial management, as the pecking order theory alone cannot be fully illustrated. Costs and benefits are ought to be considered as parts of financial theories. Hence, this study is viewed based on the trade-off theory and the pecking order theory.

### A. Static Trade-Off and Dynamic Trade-Off (TO) Theory

The Static Trade-Off theory and the Dynamic Trade-Off theory are the ideas of how the optimal capital structure is balanced between costs of debt and benefits of debt. Costs of debt include i) bankruptcy cost, ii) agency cost and iii) loss of future flexibility. Firstly, bankruptcy costs are classified into two parts, the probability of bankruptcy and the cost of going bankrupt. The probability of bankruptcy causes corporations to avoid making transactions with the firm. The cost of going bankrupt consists of direct expenses and indirect expenses. Secondly, the agency cost is a result of agency problems due to conflict interests between creditors, directors, and shareholders. Finally, loss of future flexibility happens when a company has a large number of debts, and the company is no longer able to take on another loan. This causes the company to lose opportunity to make advantages from benefits of debt which are i) tax benefits which could help saving tax by which interest can be paid as an expense, and ii) add discipline to management which is the case that CFO or

directors of a company with deadweight managing cash flow to pay off principal and interests. Therefore, being on a loan is a mechanism for a more efficient financial management. The static trade-off theory would lead to the optimal capital structure or the target capital structure. The speed of adjustment occurs when a firm attempts to adjust the actual capital structure towards the optimal target capital structure. Hence, the dynamic trade-off theory is developed from the static trade-off theory in which the static theory is considered from the past to the present, whereas the dynamic theory is considered from the present to the future. The dynamic capital structure is developed by displaying transaction costs and by empirical research on firm-specific factors that influence the relationship between the capital structure and debt ratio. Subsequently, with changes in exogenous and endogenous factors, the theory has been developed and widely viewed, for example, (Byoun, 2008; Leland & Toft, 1996; McMillan & Camara, 2012; Strebulaev, 2007; Welch, 2004)

### B. The Pecking Order (PO) Theory

The pecking order theory is the theory revealing that asymmetric information influences share prices. As a result, capital financing management that does not affect the share price shall be avoided, by using internal cash flow or debt financing. This is, therefore, a decision to choose either internal finance or external finance, in which a firm has the ordering of financing in the following order; i) retained earnings, ii) debts or debenture issuing, iii) new common stock issuing and iv) preferred stock issuing, respectively.

### C. Measurement of Variables

From the literature review, the leverage ratio and influential factors of the capital structure are designated as various patterns, as follows.

1) Leverage Ratio: Leverage ratio is a measurement of debt to total asset ratio, which is evaluated from total debt, long-term debt or short-term debt against book value or market value. The total debt to book value ratio is the most commonly used, (Chirinko & Singha, 2000; Gaud, 2003; Hovakimian, Hovakimian, & Tehranian, 2004; Loof, 2004; McMillan & Camara, 2012; Nishioka & Baba, 2004; Welch, 2004; Wiwattanakantang, 1999). Measuring of the total debt ratio is the ratio that exhibits creditor's right over firm's asset. This piece of information is preferred because it is beneficial to stakeholders. While the market value is externally influenced that does not reflect in decisions within the firm, therefore it is less often applied in (Gaud & Jani, 2005) than the book value is. Besides, (Titman & Wessels, 1988) states that leverage ratio by measuring debt to equity ratio is advantageous to investors and creditors.

2) Factors determining the capital structure: (Titman & Wessels, 1988) The Determinants of Capital Structure Choice identified eight factors that are determined as choices of the capital structure, including i) collateral value of assets, ii) non-debt tax shields, iii) growth, iv) uniqueness, v) industry classification, vi) size, vii) volatility and viii) profitability. In 2003, (Frank & Goyal, 2003) studied the relationship between thirty-nine key factors affecting decisions on the debt ratio in

the USA. They found that rational factors that influence the capital structure are i) median industry leverage(+), ii) bankruptcy risk measured by Altman's Z-Score (-), iii) firm size measured by log of sales (+), iv) dividend paying (-), v) intangible assets (+), vi) market to book ratio (-) and vii) collateral securities (+). Some factors that can partly be applied, namely, i) the variance of own stock return (-), ii) net operating loss carry forwards (-), iii) financial constrained (-), iv) profitability (-), v) change in total corporate assets (+), vi) the top corporate income tax rate (+) and vii) the Treasury bill rate (+).

### III. METHODOLOGY

#### A. Data Collection

Panel data of listed companies in ASEAN financial markets in Indonesia, Malaysia, Philippines, Singapore, and Thailand were collected from Data Stream from 2000-2013 (14 years). All industrial companies were included except financial companies. Vietnam was excluded due to insufficient data for interpretation.

#### B. Samples and variables

Dependent variables of the capital structure are shown below.

Y1 = short-term debt to total asset ratio

Y2 = long-term debt to total asset ratio

Y3 = total debt to total asset ratio

Independent variables of the capital structure are classified by firm-specific factors including i) firm size, ii) tangibility, iii) non-debt tax shields, iv) growth opportunity, v) profitability, vi) liquidity, vii) dividend payout and viii) the subprime mortgage crisis in 2008-2009.

#### C. Regression model of the capital structure

The model can be expressed as

$$Y_{jit} = X_{it}\beta + \varepsilon_{it} \dots \dots \dots (1)$$

when

the variable capital structure of the company i at time t and  
nT x 8 metrics size of 8 independent variables

SIZE variable reflecting firm size measured from logarithm of total assets

TANG variable reflecting tangibility measured from lands, buildings and appliances to total assets

NDT variable reflecting non-debt tax shields measured from depreciation and amortization to total assets

- GROW variable reflecting growth opportunity measured from growth of total assets in a year
- PROF variable reflecting profitability measured from Earnings Before Interest & Tax (EBIT) to total assets
- LIQ variable reflecting liquidity measured from the proportion of current asset to current debt
- DIVP variable reflecting dividend payout
- YEAR independent variable reflecting the subprime mortgage crisis in 2008-2009

#### IV. EMPIRICAL RESULTS

Evaluation by Generalized Least Square (GLS) methodology reveals that firm size and tangibility are significantly in an inverse correlation with short-term debt ratio (-) whereas these two factors are significantly correlated with long-term debt ratio, as well as with total asset (+). This is consistent with the hypothesis of the trade-off theory in which a large firm with high total asset is capable of having long-term debt, because it has collateral securities, and then short-term debt financing could be reduced.

Non-debt tax shield has a significant inverse correlation with total debt ratio (-) in all countries, but with different implications. In Malaysia and Philippines, non-debt tax shield is correlated with total debt ratio. This implies that debt financing increases when non-debt tax shield increases. Whereas non-debt tax shield has an inverse correlation with long-term debt ratio and total debt ratio (-) in Singapore and Thailand. As non-debt tax shield increases, debt financing is not necessary because companies have advantages from tax benefits. This is conformable to the trade-off theory. In Indonesia, non-debt tax shield has an inverse correlation with short-term debt ratio and total debt ratio (-) but is correlated with long-term debt ratio (+). Hence, the trade-off theory cannot ambiguously describe the financial behavior of the capital structure of firms in Indonesia.

The pecking order theory states that profitability, liquidity and dividend payout have an inverse correlation with the debt ratio (-). In a profitable and liquid firm, only executives and insiders have this information and the firm has a policy to primarily choose internal finance. Hence, there would be more investment from internal finances, for example, retained earnings or more investment from shareholders. This leads to a reduction of debt ratio as there is no more debt financing, and the firm would pay the dividend when liquid, without having more debt. Analysis shows that profitability, liquidity, and the dividend payout have a significant inverse correlation with debt ratio in all countries, which is consistent with the pecking order mentioned above; i.e. when a firm is a profitable, liquid and paying dividend, debt financing is reduced.

Besides, profitability is correlated with long-term debt (+) but is inversely correlated with short-term debt and total debt (-), in Indonesia and Thailand. This implies that liquidity is a result of long-term debt financing that leads to a decrease in short-term debt. The subprime crisis in 2008-2009 does not have an impact on the capital factor, as shown in Tables I-III.

Results from the study on factors determining the capital structure of listed companies in ASEAN financial markets show that size, tangibility, and non-debt tax shield are firm-specific factors that are significantly correlated with the trade-off theory. This is consistent with the study in, (Byoun, 2008; Frank & Goyal, 2003; Nishioka & Baba, 2004; Welch, 2004; Wiwattanakantang, 1999). The studied data of Singapore Malaysia Indonesia, and Philippines, are consistent with (Chong, Tak-Yan Law, & Zou, 2012; Haron, Ibrahim, Nor, & Ibrahim, 2013; Moosa & Li, 2012; Yu & Aquino, 2009) respectively. Conversely, the trade-off theory cannot be applied in Thailand, in which the pecking order would rather explain the capital structure of Thai companies (Chintanawetchakul, 2004). This may be a result of changes in financial behavior in this country.

## V. CONCLUSION

Analysis by GLS in this study is the evaluation of a model for determining the optimal capital structure measured from short-term debt, long-term debt or total debt to total asset ratio, which is the dependent variable derived from finding the relationship between independent variables that are firm-specific factors. It is found that these factors; including firm size, tangibility, non-debt tax shields, growth, profitability, liquidity, dividend payout, and impacts from a financial crisis; are significantly related in all the financial markets. The trade-off theory and the pecking order theory can evenly provide a satisfactory account for the financial behavior of the capital structure of listed companies in Singapore and Thailand. Though the pecking order theory is perhaps more suitable for the capital structure of listed companies in Indonesia, Malaysia and Philippines.

## APPENDIX

TABLE I

GLS ANALYSIS OF CAPITAL STRUCTURE IN INDONESIA AND MALAYSIA

Country		Indonesia			Malaysia			
Variable	Expd Theory	Short term debt	Long term debt	Total Debt	Short term debt	Long term debt	Total Debt	
SIZE	+	TO	-0.0050 **	0.0259 ***	0.0148 ***	-0.0096 ***	0.0238 ***	0.0162 ***
TANG	+	TO	-0.0632 ***	0.0975 ***	0.1110 ***	-0.0446 ***	0.0756 ***	0.0179
NDT	-	TO	-0.4060 ***	0.0721	-0.7000 ***	-0.0736	0.3140 ***	0.3290 **
GROW	+	PO	-0.0002 *	0.0001	-0.0001	-0.0001 **	0.0001 *	0.0001
PROF	-	PO	-0.1530 ***	-0.6660 ***	-0.8360 ***	-0.2360 ***	0.0556 *	-0.3570 ***
LIQ	-	PO	-0.0357 ***	0.0200 ***	-0.0240 ***	-0.0279 ***	-0.0051 ***	-0.0355 ***
DIVP	-	PO	-0.0001	-0.0004	-0.0007 ***	-0.0002 ***	0.0000	-0.0001
YEAR	-	PO	-0.0085	-0.0053	-0.0048	0.0058 *	0.0008	0.0011
Constant			0.3780 ***	-0.4400 ***	0.1360 *	0.3470 ***	-0.2620 ***	0.0635 **
N			332	309	343	1096	1036	1116
chi2			484.00 ***	560.00 ***	814.20 ***	8042.50 ***	3061.10 ***	2467.60 ***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

TABLE II  
GLS ANALYSIS OF CAPITAL STRUCTURE IN PHILIPPINS AND SINGAPORE

Country			Philippines			Singapore		
Variable	Expd	Theory	Short term debt	Long term debt	Total Debt	Short term debt	Long term debt	Total Debt
SIZE	+	TO	-0.0011	0.0316 ***	0.0353 ***	-0.0078 ***	0.0109 ***	0.0043 ***
TANG	+	TO	-0.0504 **	0.0845 *	0.0282	-0.0239 **	0.2120 ***	0.1870 ***
NDT	-	TO	-0.0195	0.3490	0.3290	-0.4990 ***	-0.9770 ***	-1.6240 ***
GROW	+	PO	-0.0002	0.0010 ***	0.0006 **	0.0002 ***	0.0001 *	0.0003 ***
PROF	-	PO	-0.0077	0.0544	-0.2600	-0.1700 ***	-0.1040 ***	-0.3010 ***
LIQ	-	PO	-0.0353 ***	0.0184 *	-0.0186	-0.0292 ***	0.0034 **	-0.0300 ***
DIVP	-	PO	-0.0002	-0.0004	-0.0003	0.0034	0.0000	-0.0001
YEAR	-	PO	-0.0069	0.0152	0.0143	-0.0025	-0.0051	-0.0055
Constant			0.1570 *	-0.1010	0.0593	0.3370 ***	-0.1200 ***	0.2260 ***
N			142	130	144	1059	963	1079
chi2			405.20 ***	368.50 ***	259.50 ***	1646.90 ***	3064.60 ***	2166.50 ***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

TABLE III  
GLS ANALYSIS OF CAPITAL STRUCTURE IN THAILAND

Country			Thailand		
Variable	Expd	Theory	Short term debt	Long term debt	Total Debt
SIZE	+	TO	-0.0092 ***	0.0399 ***	0.0351 ***
TANG	+	TO	-0.1120 ***	0.1030 ***	-0.0041
NDT	-	TO	-0.3470 ***	-0.0644	-0.4530 ***
GROW	+	PO	0.0002 **	0.0006 ***	0.0007 ***
PROF	-	PO	-0.2290 ***	-0.1520 ***	-0.4550 ***
LIQ	-	PO	-0.0388 ***	-0.0014	-0.0368 ***
DIVP	-	PO	-0.0003 ***	-0.0004 ***	-0.0007 ***
YEAR	-	PO	-0.0021	-0.0007	0.0065
Constant			0.4340 ***	-0.5410 ***	-0.1500 ***
N			792	671	805
chi2			3750.20 ***	3179.10 ***	24511.00 ***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

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