

# The Effects of Country Idiosyncrasies on Capital Structure: An Optimal Case in ASEAN-5

Lewis Teo Piaw Liew and Mohamad Jais

**Abstract**— The main purpose of this study is to study the effect of country idiosyncrasies on the determinants of capital structure in ASEAN-5. By applying panel data methods to a sample of firms from five ASEAN countries—Indonesia, Malaysia, Philippines, Singapore and Thailand for the period 2001-2010, the results are conclusive in supporting the effects of country idiosyncrasies. This highlights the necessity of adopting the contingency approach in formulating the optimal capital structure.

**Keywords**— Determinants of capital structure, Optimal Capital Structure, Trade-off Theory, Pecking Order Theory

## I. INTRODUCTION

THE capital structure studies in the early age had focused on firm characteristics in a single country. This has prevented earlier studies from answering the effects of country idiosyncrasies on firms’ capital structure. The absence of study on listed firms in ASEAN creates unique opportunity to shed light on the applicability of traditional capital structure theories and to unveil the actual factors affecting the capital structure. Being relatively less efficient and incomplete than the developed country, firms in ASEAN may not be able to rationalize their financing decisions to follow a clear theoretical approach. It may well be that firms in ASEAN are creating completely new capital structure formulation to suit their own distinct environment.

This study contributes to the literature by adding fresh empirical evidence to the determinants of capital structure in ASEAN. It has useful implication of how listed firms in the ASEAN countries decided the debt financing in the aftermath of Asian Financial Crisis 1997 and provides reference basis for the governments to evaluate the effects of the policy undertaken and to formulate related policy in addressing future crisis. The knowledge gained about the effects of country idiosyncrasies helps to benchmark and comprehends the conclusion that is drawn about the determinants of capital structure in each country. This provides an insight to the finance managers and policy makers into the optimal financing policy that fits the firms’ characteristics with the demands of the environment.

Understanding what lies behind the contrasting findings with the traditional theory is essential for furthering our

insight into the capital structure and financing choices of firms. This study reports some determinants with contrast effects as compared to the theories and attempts to provide new evidence to the possible explanations of the discrepancy. It is found that the leading theories of capital structure can explain some but not all aspects of the data. Reality is more complicated than even the leading theory is unable to provide adequate description on its own. Hence, it is hoped that the empirical findings in this study will assist in the development of new sophisticated theories in the future.

Unlike prior studies which ignore the non-contemporaneous effects on capital structure decision, the determinants used in estimating the optimal capital structure in this study are lagged by 1 year. This will unveil a more comprehensive understanding on the capital structure formulation as the determinants are well-known by the finance managers at the time of decision. Finally, prior researches tend to limit their analysis to certain estimation models which may lead to significant results bias. Therefore, different estimation models are employed to gain more insight into the robustness of the capital structure determinants.

The rest of this paper is organized as follows. Section II presents the research design and empirical model. The data and variables are described in Section III. Finally, the findings and conclusion are included in Section IV and V respectively.

## II. RESEARCH DESIGN AND EMPIRICAL MODEL

With the adoption of quantitative method that relies on deductive reasoning, the first step is to propose a hypothesis based on the existing theories (Trade-off Theory and Pecking Order Theory). The second step tests the operational hypothesis and finally, modifying the theory in light of findings if necessary.

In the literature, the estimation of optimal capital structure is complicated as it is not observable and a proxy has to be used. In the recent literature, the most popular approach adopted has been to estimate the optimal debt ratio as the fitted value from a regression of observed debt ratios on a set of important determinants [1]. This study adopts and modifies the model as in equation (1):

$$D^*_{i,t} = \lambda_0 + \sum_{k=1}^n \lambda_k X_{k,i,t-1} + v_i + \varepsilon_{i,t} \dots\dots\dots(1)$$

In which  $D^*_{i,t}$  is the optimal capital structure for the  $i$ th firm at time  $t$  and  $X_{k,i,t-1}$  refers to the  $k$ -th set of explanatory variables of firm  $i$ -th at time  $t-1$ ,  $v_i$  is the company’s non-observable individual effect and  $\varepsilon_{i,t}$  correspond to the error.

It is important to highlight here that two distinct features are incorporated into the econometric model. First, traditional

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capital structure theories are considered complements rather than mutually exclusive by integrating the firm factors that have been proposed into a unified framework. This is in conjunction to the findings by [2], [3] and [4]. Second, all time-variant variables used in estimating the optimal capital structure are lagged by 1 year. This is to allow the non-contemporaneous effects on capital structure decision where the determinants are well-known by the finance managers at the time of decision. In addition, the use of lagged variables also mitigates endogeneity concerns [5].

Estimation method of panel data has undergone substantial development in lieu with the advancement in statistical tools. In the literature, the following models have been widely adopted: Pooled OLS, Random Effects (RE) and Fixed Effects (FE). We start from the Pooled OLS model and Random Effects model for each country. The Breusch & Pagan LM test is carried out to determine which method in between OLS and RE is more appropriate. It is to note that Pooled OLS and RE have been proven to be bias because of the possible correlation between unobserved firm-specific effects and other explanatory variables and the possibility that the explanatory variables are not exogenous. In order to capture the firm specific effects, the Fixed Effects (FE) model is employed. This is vital as each firm has its' own unique features. Hausman test is then carried out to decide whether RE or FE is more appropriate.

However, it should be highlighted that these models do not take this into account the problems of serial correlation, heteroskedasticity and endogeneity of some explanatory variables. Prior researches tend to ignore these issues and to our knowledge, this is the first study on capital structure in this region that considers and rectifies these problems in order to report unbiased results. We carry out post estimation diagnostic test on multicollinearity by using variance inflation factor (VIF), heteroskedasticity by modified Wald Statistic and serial correlation by Wooldridge test in each panel data. If it indicates that there are heteroskedasticity and serial correlation problems, we rectify such problems by employing Fixed Effects (FE) with robust standard errors. Finally, the comparative analysis is carried out to show the effects of country idiosyncrasies.

### III. DATA AND VARIABLES

This study collects the data of the listed firms in ASEAN-5 from the Datastream. These secondary data are official and are the results of published data from all companies listed on the stock market from the period 2000-2010. We consider the period of analysis between 2000 and 2010 to highlight how the organizational level and environmental level variables contribute to the formation of contingent capital structure of listed firms in ASEAN-5 in the aftermath of Asian Financial Crisis 1997. The choice of year 2000 as the beginning of the sample period is to allow the study to control for and avoid a number of other intervening and complicating factors which occurred after the Asian Financial Crisis 1997. As public listed companies in ASEAN-5 are officially obliged to publish their audited data periodically, it confers a high degree of reliability to the data used in this study.

Instead of using the pooled analysis, we conduct country analysis in finding the determinants of capital structure for each country. In order to maximize the use of all available data, we adopt unbalanced panel regression method in each country setting. The sample selection is based on the availability of the data supplied by the database. At first, the financial companies, namely banks, insurance companies and investment societies, are excluded. This is because their capital structure is chosen in accordance with specific regulations for financial institutions and therefore exhibits different elements from non-financial companies. At the second stage, this study removes outliers within 1% and 99% percentiles. Thus, the final sample consists of 6,675 firm-year observations which come from 779 listed companies in Malaysia, 3,769 firm-year observations which come from 508 listed companies in Singapore, 2,751 firm-year observations which come from 329 listed companies in Indonesia, 2,145 firm-year observations which come from 269 listed companies in Thailand and 1,430 firm-year observations which come from 169 listed companies in Philippines.

The dependent variable in this study is the firms' capital structure which is measured by the ratio of book value of total debt to book value of total assets [6]. The reason is that financial managers use mainly book value of leverage in decision making. In the event of bankruptcy, the main cost of borrowing is the expected cost of financial distress, in which the debt holders' liability is measured using the book value of debt rather than the market value. Besides, changes in the market value of debt have no direct effect on cash savings from the interest tax shield.

As for the independent variables, it is to note that based on the theories of capital structure, a list of variables had been proposed. Nevertheless, some important variables could not be included due to the lack of market data for the companies or a large number of missing observations. Tangibility has been found to exert either positive or negative effects on capital structure. Firms with higher collateral value and higher liquidation value of tangible assets are able to raise debts at lower rate and reduce the agency cost of debt. This is reported in [1], [5], [7] and [8]. Conversely, firms with higher tangibility tend to have less information asymmetry problem and therefore have higher preference for equity which is less costly [9] and [10]. Tangibility is scaled by the ratio of fixed assets to total assets.

Profitability is reported to impose either positive or negative impact on capital structure. Firms with higher profitability have lower cost of financial distress and greater motive to shield profit from taxes [11]. Conversely, profitable firms that have sufficient retained earnings will avoid external financing which is bounded to the disciplinary role of external force [7], [8], [11] and [12]. Profitability is measured by the ratio of earnings before interest and taxes to total assets.

The size of firm has exerted mixed results on capital structure. Larger firms have greater access to capital market and financial market and can borrow at more favorable terms [8], [10] and [13]. However, [7] and [14] demonstrate that larger firms tend to release more information to the public and hence reduce the informational asymmetries. This has resulted in a negative impact as equity financing becomes cheaper than

debt financing. The proxy used for the size of the firm is the natural logarithm of total assets.

The non-debt tax shield has imposed mixed forces on capital structure. When firms have other non-interest items like depreciation and tax credit that can reduce the tax payment, the benefit of using debt lessen [11] and [14]. Nevertheless, [9] point out that firm with higher debt tend to invest heavily in tangible assets. This increases the depreciation and tax credits and hence, a positive correlation may exist between non debt tax shield and debt ratio. The ratio of annual depreciation expense to total assets is used as a proxy for non-debt tax shields.

Liquidity has been found to have either positive or negative impact on capital structure. Firms with higher liquidity have greater ability to fulfill the short term debt obligations. This implies that they can borrow more due to their ability to serve the contractual obligations on time. However, it was reported that firms with greater liquidities prefer to use internally generated funds as financing source in order to manipulate the liquid assets in favour of shareholders against the interest of debt holders. This will increase the agency costs of debt and hence exerted a negative impact on capital structure [10] and [11]. The ratio of current assets to current liabilities is used as proxy for liquidity.

#### IV. FINDINGS

To test the multicollinearity problem, VIF test is conducted and turns out to be substantially lower than 10, indicating that there is no serious multicollinearity problem for the purpose of estimation. The Breusch & Pagan LM test and Hausman test show that Fixed Effects (FE) model is more appropriate than Pooled OLS and Random Effects in all countries.

Nevertheless, modified Wald Statistic and Wooldridge test reveal that there are heteroskedasticity and serial correlation problems. Hence, we employ Fixed Effects (FE) with robust standard errors model to capture these problems. Based on this estimator, comparison is made among the countries to show the effects of country idiosyncrasies on firm's capital structure.

Table 1 presents the regression results for each country. Based on the results in Table 1, it confirms the effects of countries idiosyncrasies as the independent variables have exerted a mixed results across the countries in ASEAN-5. These results indicate that none capital structure theory can stand alone in explaining the capital structure formulation. Hence, the capital structure theories should be considered complements rather than mutually exclusive.

Firstly, the tangibility is negatively significant in Malaysia, Singapore and Philippines but positively significant in Indonesia. No significant relation is reported in Thailand. The reason why tangibility is positively or negatively significant to debt is clear, being positive as tangible assets have high collateral value while being negative as it lowers the information asymmetry. What is interesting is the insignificant result found in Thailand which is in line with [11] who argue that firms in Thailand have their primary banks as their shareholders. This reduces the need of collateral since they should have easier access to bank loan.

TABLE I  
THE REGRESSION RESULTS

	IND	MAS	PHI	SIN	THA
Constant	-1.7024 (.5967)	0.7403 (.4004)	-0.1334 (.3884)	0.9116 (.4841)	-4.6460 (1.5741)
Tangibility	0.1570 (.0709) <sup>b</sup>	-0.1361 (.0273) <sup>a</sup>	-0.1092 (.0373) <sup>b</sup>	-0.0122 (.0388)	-0.0604 (.0762)
Profitability	-0.1645 (.1753)	0.5346 (.1681) <sup>a</sup>	-0.2239 (.1717) <sup>b</sup>	-0.0246 (.0387)	0.0511 (.2035) <sup>b</sup>
Size	0.1129 (.0382) <sup>c</sup>	0.1425 (.0430) <sup>a</sup>	0.1839 (.0146) <sup>a</sup>	0.0730 (.0222) <sup>a</sup>	0.1432 (.0415) <sup>a</sup>
Non-debt Tax shields	0.5616 (.6700) <sup>c</sup>	1.0849 (.3687) <sup>a</sup>	0.4501 (.1765) <sup>b</sup>	-0.0833 (.2072) <sup>b</sup>	-0.1640 (.1998) <sup>b</sup>
Liquidity	0.5616 (.6700) <sup>b</sup>	-0.0001 (.0001) <sup>a</sup>	-0.0001 (.0052) <sup>a</sup>	-0.0054 (.0048) <sup>b</sup>	0.0054 (.7300) <sup>c</sup>

IND = Indonesia, MAS = Malaysia, PHI = Philippines, SIN = Singapore, THA = Thailand; <sup>a,b,c</sup> = significant at 1, 5 and 10 per cent respectively. The t-statistics are in parentheses.

The relation between profitability and debt ratio is positively significant in Malaysia and Thailand but negatively significant in Philippines. This implies the intention of high profit firms in Malaysia and Thailand to shield profit from taxes. In Philippines on the other hand, high profit firms use internal financing which is cheaper. These firms retain a relatively larger proportion of earnings as internal fund. This is due to the relatively weaker protection of investors and creditors in Philippines which cause difficulty for firms to raise external capital and thus, are forced to rely more on internal equity. There is no explanatory power between profitability and debt ratio in Singapore and Indonesia. This could be due to the major benefit of using debt financing to shield tax has deteriorated when there are other non-interest items that can reduce the tax payment.

Size yields positive significant coefficient in all countries. This result can be explained on the basis that in ASEAN, bigger firms are well diversified and have lower risk of bankruptcy. Besides, they have greater access to the credit market which enhances their debt capacity. Hence, there are more loans available at more favorable terms offered by the lenders. As for non-debt tax shield, it is significant in all panel data set but mixed results are reported with positive effect in Malaysia, Philippines and Indonesia (at 1% confidence level) but negative impact in Singapore and Thailand. These findings are in line with the argument that the substitution effects differ across the firms and countries. Firms in Malaysia and Philippines that employ more debts are found to invest heavily in non-current assets and thus, recorded higher depreciation. This has led to a positive relation between non debt tax shield and debt ratio. On the other hand, the negative impact in Singapore further explains why profitability has no explanatory power on debt ratio since high profit firms in Singapore can forgo the benefit of interest tax shield from debt financing and substitute it with non-debt tax shield.

TABLE II  
COMPARISON ANALYSIS

Variables	Capital Structure Theory			Country			
	TO	PO	IND	MAS	PHI	SIN	THA
Tangibility	+	-	+	-	-	-	NS
Profitability	+	-	NS	+	-	NS	+
Size	+	-	+	+	+	+	+
Non Debt Tax Shield	-	NA	+	+	+	-	-
Liquidity	+	-	+	-	-	-	+

TO = Trade-off Theory, PO = Pecking Order Theory; IND = Indonesia, MAS = Malaysia, PHI = Philippines, SIN = Singapore, THA = Thailand; + = positive relationship with debt ratio, - = negative relationship with debt ratio, NA = Not applicable, NS = No significant impact.

In summary, the estimated coefficients that differ in terms of sign, magnitude and/or significant level across the countries are conclusive in supporting the effects of country idiosyncrasies on the determinants of capital structure. This reveals that the capital structure decisions are taken in conjunction with the interaction of firm-macroeconomic-institutional variables where firms in different countries have adapted accordingly to their own organisational-environmental fits in forming the optimal capital structure. It is also worth reiterating that the traditional capital structure theories appear to have exerted mixed results across ASEAN countries, indicating that none of them can explain the full array of capital structure decision, but conditional upon the environmental setting. This means that when the business conditions change, the financing decisions and strategies may change, moving from one theory to another. As different countries have their own set of institutional setting and macroeconomic environment, there is no universal set of capital structure strategies which is optimal for all firms but different strategies should be planned to fit with the environment, contingent upon various internal and external constraints.

## V. CONCLUSION

This study sheds new insights into the capital structure formulation. The effects of the determinants turn out to be different across the countries and none of the capital structure theory can stand alone. This suggests that firm does not only consider its own conditions when deciding capital structure but also the environmental factors in which the firms operate.

Indeed, since there are explanatory variables from each theory that exert an influence in each country, it expresses a need for a unified framework that incorporates elements from all the theories. Hence, the capital structure theories should be considered as complementary rather than mutually exclusive in formulating the capital structure. The capital structure model developed in this study can be further reinforced if it could take into account the macroeconomic and institutional factors in which the firms operate. In addition, behavioral factors such as the issues of political patronage, social cultures and personality trait of finance managers may have imposed forces in the capital structure formulation. However, it is very hard to scale those factors with time variant data to reflect the respective time frame. Hence, how to measure and how to

obtain long term data for those factors are a meaningful direction of future research.

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