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Accounting Factors Affecting the Capital Structure in the Asian Economic Community

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Abstract

This paper investigates the accounting factors that affect capital structures in the ASEAN Economic Community consisting of listed firms in the primary stock markets in Indonesia, Malaysia, the Philippines, Singapore and Thailand. Capital structures are defined by total debt to capital and long-term debt to capital ratios. Tangibility, profitability, firm size, earnings per share and growth are used to study firm-specific effects. Moreover, interest rates and country dummy variables are included to observe country-specific effects in this region. The results suggest that tangibility, profitability and size are robust and consistent throughout the period. The significant positive relationship between growth and leverage can be explained by non-monotonic behavior. Managers' financing decisions are based on the cost of financing rather than maintaining their high EPS. According to the results, trade-off theory explained most of the relationships with capital structure.

Keywords: Capital structure; Dividend; Debts; Equity; Asia

Introduction

The establishment of corporation has one common objective which is to maximize shareholders' wealth. In order to stay competitive in the market, firms need to generate more income by developing and investing in new projects. However, initial finance may be inadequate to support upcoming valuable projects which require substantial capital investment. In theoretical studies, the most well-known capital structure theory that has been used as a foundation of corporate finance was first proposed by Modigliani and Miller [1]. They demonstrated that company value is irrelevant to its capital structure [2]. Later, the corrected paper from Modigliani and Miller took advantage of the tax shield originating from interest on debt into account while the previous one did not clarify this point. According to both studies, they suggested that debt financing will enhance both a firm's value and its return on equity by reducing tax liability. However, Jensen and Meckling also discovered that employing too much debt brings about agency cost of debt due to information asymmetry [3]. Moreover, Myers developed trade-off theory which describes the existence of an optimal debt level [4]. The target debt level is determined by the benefit from tax shield and cost of financial distress. When a firm employing debt exceeds its limit, this cost will decrease the firm's value.

On the other hand, pecking order theory visualizes how managers prioritize sources of finance. Information asymmetry and differences in cost of capital are the underlying reasons for managers' decisions. Retained earnings, debt and external equity will be their preferred choices, respectively. Alternatively, managers' choice on issuing debt or equity does not always follow pecking order theory or trade-off theory. Market-timing theory proved that issuing equity may be more favourable when a firm's stock price is overvalued [5].

Empirical studies by Titman and Wessels [6] and Rajan and Zingales [7] are usually cited as the fundamental studies of the relationship between numerous factors and a firm's capital structure. Their results found that each determinant such as tangibility and growth influences the capital structure in different ways. Consequently, many researchers have attempted to identify which factors really affect the variation in capital structures. However, the results are different from each other and there is no absolute conclusion drawn among the researchers. The complexity of capital structures remains as an unresolved issue. In addition, most of studies are mainly focused on the US and European markets. There is plenty of room left to explore the behaviour of capital structure in the Asian market [6,7].

In Asia, the Association of Southeast Asian Nations (ASEAN) which consists of ten countries: Brunei, Cambodia, Indonesia, Laos, Myanmar, Malaysia, the Philippines, Singapore, Thailand, and Vietnam agreed to integrate regional economies by implementing a strategy called the ASEAN Economic Community (AEC). The establishment of the AEC aims to increase interdependence among Southeast Asian countries. The AEC It is believed that cooperation among these countries will help in forming a single-market production base, highlighting its economic competitiveness in the region, improving equality of economic development and competency in global economy. Among the differences in cultures, economies, and regulations, it is worth examining the determinants of capital structure of the AEC countries so that this study will assist investors to understand how firms in these countries choose their capital structures before the investors decide to invest in the AEC firms [8].

The objective of the research is to explain how firms in each of the ASEAN country choose their capital structures by examining the relationships between firms' capital structure and six financial factors: tangibility, profitability, size, growth, earnings per share (EPS) and interest rates. The rest of the paper is organized as follows: Section is the review of literature which also discusses the theoretical framework; Section 3 is the data and methodology, while Section 6 is the results and discussion of findings. The conclusion is Section 7.

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Literature Review

Theoretical literature review

Modigliani and Miller's theory based on perfect market assumptions demonstrated that capital structure is irrelevant to the value of company [1]. In perfect market assumptions, there are no taxes, no transaction costs, no bankruptcy costs, and the same borrowing rates for both firms and investors, symmetry information for everyone, and no benefit from debt on earnings before tax and interest. However, all of these conditions are not consistent with capital markets. Modigliani and Miller proposed a correction to the capital structure theory. A new modified theory took the effect of taxes on corporate income from using debt into consideration. Interest from debt plays a crucial role in creating a tax shield which helps in maximizing firm value. This revised theory leads to the idea that firms should be entirely financed by debt in order to achieve maximum tax shield benefit [2].

However, the taxes-incorporating theory from Modigliani and Miller failed to include the bankruptcy and agency costs when a firm mainly relies on debt financing [2]. The bankruptcy costs discussed by Kraus and Litzenberger explained that there is an inverse relationship between tax shield benefits and bankruptcy costs [9]. They proved that when the firm employs more debt and cannot meet the debt obligations, it will unavoidably incur bankruptcy penalties. Moreover, Jensen and Meckling suggested that agency cost of debt will occur when the firm relies more on debt [3]. The manager who acts on behalf of shareholders and debtholders needs to ensure that both parties' interests are balanced. Hence, the manager needs to find an equilibrium point, as both principals rarely have similar interests. Referring to the previous studies, there must be an optimal level between debt and equity financing in order to maximize tax shield benefits and minimize bankruptcy and agency costs [10].

Based on given theories, they lead to one important question, which is: How do firms make decisions on capital structures?

Myers developed a theory called 'trade-off theory' which plays an important role for firms' decisions on capital structure. Trade-off theory is an underlying assumption that firms will gradually adjust their capital structures towards an optimal target of debt ratio. The variation in capital structures across firms are attributed to cost of adjustment and cost of financial distress. The former pushes the firms away from their optimal ratios; therefore it causes lagging and dispersion in capital structure. The latter involves bankruptcy costs, moral hazard, and agency costs. On the other hand, interest expenses can be used to reduce tax liability, bringing about a higher return to shareholders. Thus, the optimal debt level determines the firm's market value at its maximum interest tax shields level, without encountering the cost of financial distress. In the sense of trade-off theory, high profitable firms should borrow more to gain further tax shields, leading to higher debt levels [11].

Another important theory also discussed by Myers that visualizes how firms prioritize the source of finance is called the pecking order theory. The underlying assumption of this theory is information asymmetry. Pecking order theory suggests that firms will rely on internal equity, debt and external equity, respectively. Internal finance will be the first option because it has no transaction costs involved compared to debt. When internal equity is depleted, firms will choose to issue debt rather than equity. The cost of issuing new equity is composed of underwriting and administrative costs which are considered more costly compared to debt. Newly issued equity cannot generate a tax advantage and also causes dilution in shareholders' wealth. In addition, issuing debt can send a signal to the market regarding the confidence in a new investment project. The firm is going to be profitable and to be able to make a repayment on debt. An empirical research by Myers and Majluf supported that choice of debt is more preferable than equity because of managerial capitalism, 'managers avoiding to be subjected to the discipline of capital market and cutting the ties that bind managers' to stockholders' interests' [11].

As discussed, the variation in capital structures cannot be explained by one single theory. There is no consensus among researchers about which one is the best fitting theory for a capital structure study. The aim of this study is to determine which factors have an influence on capital structure in ASEAN region and each ASEAN country. Tangibility, profitability, size, EPS, growth and interest rate will be included in this study's model. A further aim is to examine whether trade-off or pecking theory can best explain a firms' capital structures decision. The following section will be an empirical literature review of each variable to give the general ideas of this study.

Capital structure

Generally, capital structure is defined as a combination of debt and equity financing. Debt can also be classified as short-term and long-term. The proportion of debt over capital or assets, known as leverage, is used as a proxy to study the determinants of capital structure. In Rajan and Zingales [7] study, they categorised leverage into two definitions, which are book leverage and market leverage, in order to differentiate between the effects of factors on each type of leverage; also, Frank and Goyal [12] used total debt to market assets or book assets. In this study, total debt and long-term debt to capital ratio are used as proxies of leverage [7,12].

Tangibility

Titman and Wessels [6] investigated major factors that have an effect on the debt ratio of US firms. The proxy for tangibility in their study is all tangible assets (including inventories). When firms hold a high portion of tangible assets compared to total assets, the tangible assets can be used as collateral. The collateral assets assist firms in being able to borrow more because lenders will be more confident that managers will make a decision decisively before investing in a risky project. Hence, collateral assets can mitigate agency costs of debt problems and also push towards an optimal debt ratio. The result shows the positive relationship between tangibility and debt-to-equity ratio. On the other hand, they also tested intangible assets to total assets. Unsurprisingly, the results exhibit a negative relationship of intangible assets and leverage because they cannot be used as collateral [6].

Profitability

Profitability is usually defined by Earnings before interest, taxes, depreciation and amortization (EBITDA) to total assets. Previous studies exhibited two different scenarios. In the first scenario, trade-off theory predicts that firms with high profitability tend to borrow more in order to gain tax shield benefits. On the other hand, the pecking order theory explains that the choices of source of finance that firms prefer are internal finance, debt, and issue of equity, respectively. Based on trade-off theory, the positive relationship between leverage and profitability because firms will borrow more to gain tax shield advantages, is expected [11].

Size

Firm size is also an important indicator that differentiates

variation in capital structures. Generally, firm size can be defined by two definitions which are: the natural logarithm of total assets or total sales. In this study, tangibility is used as one factor to measure leverage; therefore, the natural logarithm of total revenues is preferred in order to avoid any correlation that might affect the results [12-15].

According to Remmers et al., firms with high revenues are capable of obtaining more debt because they tend to be more diversified, compared to small firms. It can be considered that diversifying into various investments can lower the bankruptcy costs bringing about the lower cost of debt [15]. Moreover, Pinches and Mingo also explained the relationship between bond rating and revenues, saying that higher revenues can help firms to access sources of debt more easily with reasonable interest rates. Consequently, the positive relationship between leverage ratio and firm size should be observed [14].

Earnings per share (EPS)

A key measurement of manager's performance is EPS which can be computed as net income divided by number of shares outstanding. Issuing equity will have a substantial impact on EPS because it increases the number of shares bringing about the EPS dilution effect. On the other hand, borrowing does not have an effect on EPS; it also gives tax shield benefits regarding trade-off theory. High EPS indicates that the company has high profits; therefore, it helps the push optimal debt level further and debt holders can be confident that the company will be able to make a repayment. Thus, the EPS ratio has an influence on managers' decisions [16].

Growth

The share price of firms reflects investors' expectations. On the one hand, a firm with high market value compared to its book value implies that it has a high growth opportunity or overvalue. On the other hand, the firm with low market-to-book ratio is defined as low growth or undervalue. From a trade-off theory point of view, firms with high growth will have less free cash flow problems [12]. However, inadequate free cash flow can bring about a severe agency cost of debt and cost of financial distress. As, the high growth firm has high volatility in terms of cash income, it may not be able to deliver a debt repayment on time [17,18]. Moreover market-timing theory supports the high growth firm's preference for issuing equity rather than debt financing when its stock price is overvalued [4].

Interest rate

According to the pecking order theory, when firms' internal funds are depleted, they will look for external finance, i.e., debt and equity. Between these choices, each will return a different effect of tax benefits and cost of capital. Managers will consider which source of finance is the more appropriate depending on prevailing market conditions [4]. For instance, when the stock market has a good performance, the manager may decide to issue new equity because its stock price is overvalued. On the other hand, when the interest rates are very low or expected to fluctuate, issuing debt will be a preferred approach, because it costs less than equity [19]. The risk-free government bond is usually used as a reference rate for a company to decide whether debt or equity is more preferable [20].

Data and Methodology

Data collection

The primary sources for this study were taken from DataStream. The financial data of listed firms in primary stock markets of the five

countries consist of the Stock Exchange of Thailand (SET), Singapore Exchange Limited (SGX), Philippine Stock Exchange (PSE), Surabaya Stock Exchange (SSX, Indonesia) and Bursa Malaysia (MYX) during the period from 2004 to 2014. As previously explained, the other five AEC countries are excluded from this study because of limited data. Samples included firms from every industry except banking firms because they have different characteristics of capital structures compared to other firms. Annual financial data of each firm are considered. Furthermore, all the data are filtered and then the companies that have some missing information are excluded so that balanced panel data could be obtained. After filtering all information from the above criteria, all samples consisted of 126 Indonesian, 345 Malaysian, 81 Philippine, 231 Singaporean, and 233 Thai firms.

The distribution of the data of each country was analyzed by pooled regression model, fixed effects model or random effects model. The Hausman test, and the Breusch and Pagan Lagrange Multiplier test will play an important role in identifying which one of these models should be implemented to each country's data set.

The samples obtained from DataStream consisting of both time-series (from 2004 to 2014) and cross-sectional (number of firms and independent variables) data are called panel data. The study of panel data helps to take the impact of heterogeneity into consideration. Using panel data allows us to study dynamic changes in this study's sample and to observe some effects that would not exhibit their properties in only time-series or cross-sectional analysis. Besides, combining both types of data can enhance the ability to achieve a more complex model because of the diversity and reliability of the data [21]. Generally, methods of studying panel data can be categorized into three methods: pooled regression, fixed effects model and random effects model.

Pooled regression

The pooled regression model states that independent variables are non-random and not correlated with the error term [21]. In other words, these variables are exogenous. The model neglects any uniqueness such as managerial ownership or company's vision that are time-invariant across firms or countries and these unobserved individual characteristics are captured in one interception, the term α. Generally, when panel data are regressed, the following equation is obtained:

$$Y_{i,t} = \alpha + \beta_i X_{i,t} + u_{i,t}$$

Fixed effects model

This model allows the observation of heterogeneity and time-invariant factors among firms. Two common approaches are the Least-Square Dummy variable (LSDV) model and Within-Group (WG) estimator. For the first method, dummy variables are assigned for each uniqueness of each firm or country so that specific interception can be obtained. However, one concern when using dummy variables is the dummy variable trap which brings about perfect collinearity. This problem can be remedied by dropping one specific variable and then assigning a 0 value for that variable. The second approach gives us interception in terms of mean-corrected values, in contrast to the former approach which results in specific interception. In addition, this method will not use up any degree of freedom in the regression compared to the LSDV method. In this study, the Within-Group estimator is the primary method used for the fixed effects model.

$$Y_{i,t} = \alpha_i + \beta X_{i,t} + u_{i,t}$$

Random Effects Model

Unlike the fixed effects model, the random effects model is based on the rationale that it is difficult to achieve an exact model [22]. The underlying assumptions for the model are that both individual-specific and combined time-series and cross-sectional error terms (idiosyncratic term) are not correlated with each other and other estimators. Furthermore, these error terms must not have a serial correlation. The model treats uniqueness and individual characteristics as random variables and includes them in a composite error term. Alternatively, this model is known as the error components model (ECM).

$$Y_{i,t} = \alpha + \beta X_{i,t} + w_{i,t}$$

In order to decide which model is appropriate, the Hausman test will play a major role in distinguishing between fixed effects and random effects. The rationale behind the test is that estimators do not differ substantially (null hypothesis). If we reject the null hypothesis, it suggests that the fixed effects model is preferred. On the other hand, if we accept the null hypothesis we need to examine further if the pooled regression or random effects model is more suitable. The Breusch and Pagan Lagrange Multiplier test helps in deciding between the two choices by testing that whether the random effects in our model exists or if the idiosyncratic term equals zero. If we cannot reject null hypothesis, it means that pooled regression will be a favourable model.

Determinants of capital structure

The model in this study was inspired by Frank and Goyal's study which examined the determinants of capital structure by using leverage as the dependent variable [12]. The equation for the study is shown below. However, the proxies for leverage used in this study were slightly different from their study, as, total debt to capital ratio and long-term debt to capital ratio are used as the dependent variables in this study. Therefore, the definitions of each variable are described in Table 1.

$$Leverage_{i,t} = \alpha + \beta X_{i,t-1} + u_{i,t}$$

Summary of research hypotheses

The relationship between six independent variables and leverage ratios will be anticipated based on trade-off theory. Six hypotheses are shown below.

H1: There is a positive relationship between leverage ratio and tangibility.

H2: There is a positive relationship between leverage ratio and profitability.

H3: There is a positive relationship between leverage ratio and size.

H4: There is a positive relationship between leverage ratio and earnings per share.

H5: There is a negative relationship between leverage ratio and market-to-book value.

H6: There is a negative relationship between leverage ratio and interest rates.

Results and Discussion

Descriptive statistics

In this section, the mean, maximum, minimum, kurtosis and skewness of each variable was investigated. In term of kurtosis, a value greater than three is considered to be the Leptokurtic distribution (concentrated around the mean). A value less than three is the Platykurtic distribution (wide spread around the mean) and a value equal to three is the Mesokurtic, or normal distribution [23]. Furthermore, a skewness value less than -1 (left skewed) or greater than +1 (right skewed) is considered to be a highly skewed distribution. A value between -1 and -0.5 (left skewed) or between 0.5 and 1 (right skewed) is a moderately skewed distribution. Lastly, a value between -0.5 and 0.5 is similar to symmetry distribution [24].

The descriptive statistics of five ASEAN countries containing debt-to-capital ratio, long-term debt to capital ratio, tangibility, profitability, size, EPS, growth and interest rate are shown in Table 2. The total samples cover from 2004 to 2014. The number of observations in each year is equal to 1,016 firms (total of 11,746 observations).

According to Table 2, the total DC ratio in this region varies from unlevered (0.000) to extremely highly levered (1.3017). On average, ASEAN firms have total debt less than 33% of their capital. Indonesian firms employ debt more than other countries (0.3201) while Philippine firms are less likely to rely on debt financing (0.2248). Unlevered firms (0.000) can be observed in every country. Interestingly, there is a Thai firm whose capital structure is mainly reliant on debt financing which is approximately 1.3 times its capital. The dispersion of data in each country is moderately deviated from its mean (0.1928-0.2391). Skewness indicates that the data of Indonesia (0.2590), Philippine (0.4483) and Thai (0.3616) firms are approximately symmetrically distributed. However, Malaysia (0.6103) and Singapore (0.5013) have a moderately right-skewed distribution which implies that the majority of data are concentrated on the left of their mean. All distributions are flatter than a normal distribution and spread wider around the mean because of low kurtosis values (i.e., less than 3).

For the LTDC ratio, the average of long-term debt using by ASEAN firms is less than 20% of their total invested capital. The proportion of long-term debt over total debt is approximately 50% in ASEAN region. Firms in Malaysia and Thailand have long-term debt ratio higher than 100% which means that their capital structures hugely depend on long-term debt. On the other hand, there are a number of firms that do not engage in long-term debt obligations. Samples are deviated rapidly from their mean because of high standard deviations. Highly positively-skewed or long right-tailed distribution (skewness>1) which can be found in Malaysia (1.5237), Singapore (1.3007) and Thailand (1.0340), demonstrate that most of the firms in these countries have a long-term debt ratio less than average. For Indonesia (0.8940) and the Philippines (0.9966), the samples are moderately skewed to the right. Additionally, the distribution of data are spread wider with their peak lower than normal distribution (kurtosis<3).

Tangibility is defined by a ratio of fixed over total assets. The

Variables	Definition
Debt-to-capital ratio (DC)	Total debt to capital ratio (dependent variable)
Long-term debt-to-capital ratio (LTDC)	Long term debt to capital ratio (dependent variable)
Tangibility (Tang)	Fixed asset to total assets ratio
Profitability (Prof)	Earnings before tax, interest, depreciation and amortization to total assets ratio
Size (Size)	Natural logarithm of revenues
Earnings per share (EPS)	Net income to number of shares outstanding
Growth (Grow)	Market to book value
Interest rates(Int)	90-day Treasury bill interest rate

Table 1: Variables and definitions.

Country	DC	LTDC	Tang	Prof	Size	EPS	Grow	Int
Indonesia								
Mean	0.3201	0.1892	0.3719	0.1432	11.9475	0.0176	2.3459	0.0787
SD	0.2391	0.208	0.2218	0.1193	1.7517	0.0613	4.4224	0.0208
Kurtosis	-0.9302	-0.215	-0.89	7.1319	0.6962	107.0598	59.9614	1.189
Skewness	0.259	0.894	0.2271	1.1363	-0.3195	9.0547	6.797	0.9149
Minimum	0	0	0.0015	-0.647	3.3322	0	0.12	0.0467
Maximum	0.9856	0.8872	0.9472	0.9068	16.8113	1.06	55.21	0.1303
Malaysia								
Mean	0.2468	0.1383	0.3653	0.0959	11.4634	0.0525	1.2548	0.0315
SD	0.2029	0.1663	0.2081	0.1343	1.4761	0.167	2.1441	0.005
Kurtosis	-0.3015	2.2665	-0.2237	764.0763	0.4268	1930.5575	116.3328	-0.1502
Skewness	0.6103	1.5237	0.4351	19.0284	0.2171	38.0888	9.4372	-0.4508
Minimum	0	0	0	-1.1164	5.0434	0	0.11	0.0208
Maximum	1.0134	1.0001	0.9805	5.6081	16.3999	8.73	37.97	0.0395
Philippines								
Mean	0.2248	0.1469	0.3527	0.1112	10.8501	0.1102	1.5245	0.0369
SD	0.1928	0.1666	0.2468	0.1079	2.5418	0.5276	1.6904	0.0193
Kurtosis	-0.9206	0.0077	-0.948	20.5244	0.1051	70.0474	24.1753	-0.4837
Skewness	0.4483	0.9966	0.2945	-0.1649	-0.3367	7.741	3.7777	0.3771
Minimum	0	0	0	-1.0773	1.0986	0	0	0.009
Maximum	0.7791	0.745	0.9747	0.7523	16.6981	7.13	17.9	0.0763
Singapore								
Mean	0.2597	0.1394	0.282	0.0944	11.944	0.1122	1.5679	0.01
SD	0.1995	0.1634	0.2244	0.1088	1.6716	0.5379	2.204	0.0101
Kurtosis	-0.4385	1.2451	0.0017	40.1982	1.4818	362.5083	76.2907	-0.0163
Skewness	0.5013	1.3007	0.8492	-2.6825	0.5521	16.2345	7.1308	1.1712
Minimum	0	0	0.0001	-1.3441	4.0431	0	0.01	0.0025
Maximum	0.9784	0.9653	0.994	1.0361	18.3987	15.71	36.6	0.0331
Thailand								
Mean	0.293	0.1638	0.3833	0.1211	11.5568	0.073	1.6658	0.0246
SD	0.2299	0.1884	0.2261	0.1085	1.6399	0.2242	2.8626	0.0113
Kurtosis	-0.7423	0.5425	-0.7011	9.2956	1.172	189.5159	247.581	-0.5409
Skewness	0.3616	1.034	0.289	0.0556	0.3078	10.6261	13.256	0.3033
Minimum	0	0	0.0017	-0.8016	4.7791	0	0.07	0.0094
Maximum	1.3017	0.9533	0.9739	0.8032	18.349	5.6	72.25	0.0478

Table 2: Descriptive statistics of five AEC countries.

maximum values are all over 90% and little different across the region. Most of the AEC countries hold a proportion of fixed assets on average more than 35% while Singapore has this ratio at less than 30%. One possible reason for a low tangibility in Singapore is that obtaining large areas of land as a fixed asset in this small country is very costly. Supporting evidences are its skewness and kurtosis. The distribution of data that are moderately right-skewed (0.8492) and have a low-widened peak (0.0017) suggests Singaporean firms hold fixed assets that are less than the country's average. Nevertheless, most firms in the remaining countries are symmetrically distributed and concentrated around their mean.

Profitability, EBITDA-to-total assets ratio, gives an idea of how much earnings before interest, tax, depreciation and amortization are generated by firms. Negative profitability signals unhealthy revenues after deducting cost of goods sold. The average profitability that ASEAN firms can generate is more than 0.09. On average, Indonesia firms (0.1432) and Singaporean firms (0.0944) are able to generate the highest and lowest income over total assets, respectively. The maximum and minimum profitability are extremely dispersed across the region. There is a huge variation in maximum profitability which varies from 0.7532 to 5.6081. Besides, a firm that has minimum negative earnings can be found in Singapore (-1.3441). The distribution

of samples in the Philippines (-0.1649) and Thailand (0.0556) is similar to normal distribution. However, the three remaining countries exhibits a highly right-skewed distribution, meaning that most firms have poor performance compared to the average. The sharply-peaked distribution in every country, Leptokurtic (kurtosis>3) highlights that there is a high probability of finding some extreme values at the end of the distribution.

Firm size, defined by the natural logarithm of revenues, is one of the variables in this study. Average firm's size in this region is approximately 12. According to this result, average firm size in Indonesia (10.8501) can be considered the smallest scale compared to other countries. Interestingly, Singapore is a very small country but there is a company that could generate the highest income as much as 18.3987. The minimum values of size which are less than 4 can be observed in Indonesia (3.3322) and the Philippines (1.0986). Low standard deviation compared to its mean show that the data are dispersed near the average. Furthermore, the skewness also confirms that the samples of each country are normally distributed. Low kurtosis demonstrates that all distributions are flatter than a normal one and the data are spread wider around the mean.

For EPS, there is a large gap of averages among ASEAN countries which vary from 0.0176 to 0.1122. The results shown suggest that

investing in Singapore (0.1122) and the Philippines (0.1102) can generate the highest rate of return for shareholders. The rate of return from Indonesia (0.0176) and Malaysia (0.0525) may not be good enough to draw investors' attention. The huge differences within and across countries are derived by skewness and kurtosis. Most of the ASEAN firms can generate EPS less than average within its country (skewness>1). Moreover, this distribution has a substantial peak (kurtosis>3) with a high probability of extreme values that locate far away from the right of the mean.

Growth is defined by market-to-book value. The market value reflects investors' expectations in the stock market which are different across firms, industries, and countries. The results show that Indonesian firms have the highest average growth ratio (2.3459) compared with their neighboring countries. The reasonable average growth ratio can be observed in Malaysia (1.2548) because its market value is close to book value. Surprisingly, extremely overvalued firms exist in every country, ranging from 17 to 72 times the book value. High growth ratio means high expectations from investors in the stock market and good prospects of firms. Nevertheless, there are firms in this region that cannot draw the attention of investors, resulting in a very low growth ratio (0 to 0.12). The distribution of samples is extremely skewed to the right, exhibiting that most of data are located between 0 and the average (skewness>1). Combined with extremely high kurtosis indicates that the data are centred on their mean with the high probability of extreme value at the end of the distribution.

Interest rate is the last variable in the descriptive statistics section. The average interest rate is measured by using average the 90-day Treasury bill from DataStream as a benchmark to capture variation across countries. The highest average interest rate is in Indonesia (7.87%) and the lowest in Singapore (1%). The maximum and minimum rates during the period from 2004 to 2014 vary from 13.03% to 0.25%, respectively. The distribution of all countries exhibits from highly-skewed (Singapore), moderately-skewed to the right (Indonesia and Thailand) and approximately symmetrically distribution (Malaysia and the Philippines). Kurtosis values show that all distributions have a Platykurtic shape.

Regression analysis of all AEC countries

In this section, samples of all AEC countries, combined with interest rate and country dummy variables are pooled together so that country-specific effects can be observed.

The results from all AEC countries pooled together are shown in Table 3 for both DC and LTDC ratios. In this regression, country-specific variables, country dummy variables and interest rates, are included. The period of study is divided into two periods (5-years each) so as to observe the consistency of significant variables on both leverage ratios. The structural stability test (Chow test) was applied to the regression analysis in order to determine the differences in the 5-year time periods. F statistical values show that there is a significant difference between the two periods of regression for both leverage ratios.

For tangibility, the positive relationship between tangibility and both leverage ratios is consistent with statistical significance at 99% level of confidence throughout all periods. Positive coefficients indicate that holding a greater proportion of fixed assets helps firms to increase their debt level. The coefficients between profitability and leverage ratios are negative and significant at 99% (full period, 2004-2009) and 95% levels of confidence (2009-2014). A stronger negative relationship can be found in the DC ratio. The higher profitability generated by firms will cause a reduction in firms' leverage. In Table 3, both leverage ratios

Variables	DC			LTDC		
	Full Period	2004-2009	2009-2014	Full Period	2004-2009	2009-2014
Tangibility	0.0831**	0.1136**	0.0447**	0.1325**	0.1747**	0.0855**
	(0.0099)	(0.1308)	(0.0136)	(0.0085)	(0.0116)	(0.0120)
Profitability	-0.4160**	-0.4870**	-0.3654*	-0.2301**	-0.2530**	-0.2140*
	(0.0953)	(0.0550)	(0.1442)	(0.0549)	(0.0391)	(0.0866)
Size	0.0406**	0.0422**	0.0426**	0.0301**	0.0302**	0.0312**
	(0.0019)	(0.0019)	(0.0026)	(0.0013)	(0.0016)	(0.0019)
EPS	-0.0302*	-0.0662**	-0.0224	-0.0084	-0.0165	-0.0072
	(0.0120)	(0.0165)	(0.0127)	(0.0068)	(0.0107)	(0.0079)
Growth	0.0040*	0.0050*	0.0028	0.0043**	0.0057**	0.0030
	(0.0015)	(0.0025)	(0.0023)	(0.0013)	(0.0020)	(0.0018)
Interest	0.5703**	-0.5079*	-0.1125	0.1511	-0.5927**	-0.2656
	(0.1678)	(0.2505)	(0.3889)	(0.1390)	(0.2062)	(0.3301)
MLD	-0.0374**	-0.1078**	-0.0530***	-0.0301**	-0.0868**	-0.0315*
	(0.0109)	(0.0180)	(0.0174)	(0.0090)	(0.1531)	(0.0147)
PHD	-0.0313**	-0.0945**	-0.034	0.0003	-0.0599**	0.0141
	(0.0106)	(0.0160)	(0.0180)	(0.0090)	(0.0138)	(0.153)
SGD	-0.0252	-0.1127**	-0.0599*	-0.0298**	-0.1001**	-0.0419*
	(0.0135)	(0.0213)	(0.0261)	(0.0113)	(0.0182)	(0.0222)
THD	0.0144	-0.0658**	-0.0013	-0.0066	-0.0756**	-0.0030
	(0.0117)	(0.0193)	(0.0198)	(0.0097)	(0.0161)	(0.0169)
Constant	-0.1925*	-0.0921**	-0.1860**	-0.2123**	-0.1368**	-0.2128**
	(0.0229)	(0.0327)	(0.0353)	(0.0183)	(0.0275)	(0.0291)
Observations	10160	5080	5080	10160	5080	5080
F	121.42	77.58	65.91	110.03	71.77	53.12
R2	0.1477	0.1562	0.1556	0.1275	0.1439	0.1271

Standard errors in parenthesis; statistically significant at $p < 0.05$ (*) and $p < 0.01$ (**).

Table 3: Regression analysis of all AEC countries with country-specific effects.

demonstrate a significant positive relationship with firm's size at the 1% level. The impact of size on both ratios has little difference in terms of coefficients throughout the period and for both leverage ratios. Positive coefficients indicate that earning more revenues positively affects firms' leverage. For EPS, this variable exhibits a negative relationship at 5% (full period) and at 1% (2004-2009) significance levels only on the DC ratio. The significant relationship implies that a positive change in EPS will cause a reduction in the firm's debt level. The results are not robust for both leverage ratios.

In the full period and from 2004-2009, the growth ratio has a significant positive relationship at 1% level for the DC ratio and the 5% level for the LTDC ratio, respectively. Interpretation of this relationship is that high growth firms tend to be more leverage. According to descriptive statistics, the samples are strongly right-skewed indicating that most of data contain many low to medium growth firms, and accumulate on the left of the mean resulting in a positive relationship between leverage and growth. In the full samples period, a significant positive relationship between interest rate and debt-to-ratio at 99% level of confidence is exhibited. The positive relationship is not robust and is inconsistent for both ratios. However, a significant negative relationship can be observed in both DC and LTDC during 2004-2009. The negative relationship is consistent with the author's prediction and trade-off theory. When the interest rate is low, firms will employ more debt because of the lower cost of borrowings. Firms can gain access to cheap sources of debt and gain maximum tax shields.

Lastly, the country dummy variables confirm that the country-specific effect has an influence on firms' leverage. Most coefficients are significant for both leverage ratios with different signs. These results demonstrate that there are significant differences across countries especially from 2004 to 2009.

Regression analysis of each country

This section begins by testing which model should apply to each country by using the Hausman and Breusch-Pagan Lagrange Multiplier test (BP), respectively. The results to determine the preferred model are shown in Table 4.

The results demonstrate that the fixed-effects model is fitting for Indonesia, Malaysia Singapore, and Thailand because of the rejection of the null hypothesis. For the Philippines, a non-rejection of the null hypothesis leads to the Breusch-Pagan test which clearly confirms that the random-effects model is preferred for this country. The equation used to study the determinants of the capital structure of each country shows that independent variables are all 1-year lagged to reflect changes of leverage from previous and alleviate the possibility of endogeneity as shown below:

$$Leverage_{it} = \alpha + Tang_{i,t-1} + Prof_{i,t-1} + Size_{i,t-1} + EPS_{i,t-1} + Grow_{i,t-1} + u_{i,t}$$

The regression results of DC ratio and LTDC ratio are displayed in Tables 5 and 6, respectively.

The R-squared values in all regressions are low but they are all statistically significant. Moreover, the independent variables are also significant at different levels. The relationship of each variable will answer the most important question in this study about which factors have an influence on capital structures. For Indonesia, Malaysia, and Singapore, they exhibit a positive relationship between tangibility and in both the DC and LTDC ratios at 1% levels of significance. The significant relationship is consistent in both leverage ratios. Holding a higher proportion of fixed assets can influence firms to attain higher levels of debt. Based on trade-off theory, fixed assets can be used as collateral assets and are easy to liquidate in the case of bankruptcy.

The profitability ratio demonstrates a significantly negative

Conutry		Indonesia		Malaysia		Philippines		Singapore		Thailand	
Leverage		DC	LTDC	DC	LTDC	DC	LTDC	DC	LTDC	DC	LTDC
Hausman	Prob	0.0000	0.0000	0.0000	0.0000	0.3825	0.2788	0.0003	0.0084	0.0009	0.0000
BP		-	-	-	-	0.0000	0.0000	-	-	-	-
Model		Fixed		Fixed		Random		Fixed		Fixed	

Table 4: Results of the Hausman and Breusch-Pagan Lagrange multiplier tests for DC and LTDC ratios.

DC	Indonesia	Malaysia	Philippines	Singapore	Thailand
Tangibility	0.1868**	0.1337**	0.1041	0.1532**	0.0503
	(0.0595)	(0.0381)	(0.0556)	(0.0382)	(0.0578)
Profitability	-0.2996**	-0.1049**	-0.2224**	-0.2004**	-0.3985**
	(0.0941)	(0.0351)	(0.0687)	(0.0457)	(0.0578)
Size	-0.0064	0.0017	0.0408**	0.0203*	0.0292**
	(0.0114)	(0.0091)	(0.0055)	(0.0083)	(0.0104)
EPS	-0.1423	0.0041	0.0027	-0.0107**	-0.0157
	(0.1039)	(0.0122)	(0.0050)	(0.0026)	(0.0158)
Growth	0.0019	0.0145**	-0.003	0.0056	0.0022
	(0.0025)	(0.0040)	(0.0058)	(0.0034)	(0.0037)
Intercept	0.3637*	0.1698	-0.2255**	-0.0152	-0.0199
	(0.1388)	(0.1085)	(0.0607)	(0.0983)	(0.1277)
Observations	1260	3450	810	2310	2330
F-test/Wald chi	5.19**	7.16**	69.23**	9.72**	12.06**
R2:Within	0.0677	0.0488	0.0607	0.0569	0.0741
R2:Between	0.1026	0.0072	0.5382	0.0715	0.1785
R2:Overall	0.0929	0.0148	0.3874	0.0671	0.1468
Model	Fixed	Fixed	Random	Fixed	Fixed

Standard errors in parenthesis; statistically significant at p<0.05 (*) and p<0.01 (**).

Table 5: Regression analysis of ASEAN countries for DC.

LTDC	Indonesia	Malaysia	Philippines	Singapore	Thailand
Tangibility	0.1954**	0.1269**	0.0464	0.1348**	-0.0182
	(0.0591)	(0.0330)	(0.0552)	(0.0344)	(0.0443)
Profitability	-0.2305**	-0.0372*	-0.1855**	-0.0528	-0.1988**
	(0.0763)	(0.0157)	(0.0549)	(0.0315)	(0.0533)
Size	-0.0148	-0.0020	0.0326**	0.0134	0.0082
	(0.0097)	(0.0084)	(0.0047)	(0.0072)	(0.0090)
EPS	-0.0891	0.0025	0.0112	-0.0114**	-0.0024
	(0.0676)	(0.0078)	(0.0063)	(0.0018)	(0.0137)
Growth	0.0013	0.0108*	0.0007	0.0012	0.0050
	(0.0014)	(0.0042)	(0.0050)	(0.0021)	(0.0027)
Intercept	0.3184*	0.1039	-0.2052**	-0.0547	0.0895
	(0.1244)	(0.0997)	(0.0483)	(0.0862)	(0.1047)
Observations	1260	3450	810	2310	2330
F-test/Wald chi	6.31**	5.9**	62.19**	9.71**	2.99*
R2:Within	0.0704	0.0304	0.0395	0.0283	0.0383
R2:Between	0.0816	0.0074	0.4881	0.1110	0.0757
R2:Overall	0.0784	0.0125	0.3139	0.0820	0.0572
Model	Fixed	Fixed	Random	Fixed	Fixed

Standard errors in parenthesis; statistically significant at $p<0.05$ (*) and $p<0.01$ (**).

Table 6: Regression analysis of ASEAN countries for LTDC.

relationship in almost all countries for the both DC and LTDC ratios. The level of leverage is decreased when firms have high profitability. Retained earnings are more concerned with this region rather than debt. Therefore, pecking order theory seems more consistent with the results than trade-off theory.

The positive relationship between size and leverage ratio can be explained in some AEC countries. In the Philippines, firm's size plays an important role in determining its capital structures. However, firm's size has a positive relationship with DC only in Singapore and Thailand at 99% level of confidence leaving LTDC insignificant. Size is a proxy which indicates diversification in various investments of firms. It alleviates agency cost and cost of financial distress and helps in increasing firms' borrowing capabilities. According to the results, the interaction between size and leverage is in line with trade-off theory.

For EPS, the negative relationship at the 1% significance level is observed only in Singapore. This relationship is confirmed by both leverage ratios. Nonetheless, this relationship is opposed to the author's initial assumption. These results can be attributed to pecking order theory. The higher earnings that firms can gain are more likely to be used as internal equity.

Market-to-book ratio, growth, has a positive relationship with DC and LTDC at 1% and 5% levels of significance, respectively. This positive trend can only be found in Malaysian firms. This relationship indicates that high growth firms tend to be more levered. In general, there is a negative relationship between growth and debt ratio explained by the trade-off theory framework. However, the negative relationship results from non-monotonic behaviour. Proved by Chen and Zhao and supported by Huynh and Petrunia, the positive relationship between growth and leverage is influenced by low and medium growth firms [25,26].

Conclusion

This study examines from accounting perspectives, the firm-specific and country-specific factors that affect firms capital structures in the ASEAN region. The results clarify how ASEAN countries choose their capital structures before ASEAN Economic Community will be effective. Listed companies in the primary stock exchanges

of Indonesia, Malaysia, the Philippines, Singapore and Thailand are investigated during the period from 2004 to 2014.

Descriptive statistics demonstrate that the average proportion of debt and long-term debt in this region are approximately one-third and one-fifth of their capital. The highest mean of leverage can be observed in the Philippines. Singapore is the country that holds average tangible assets less than 30% compared to its neighbours. The average profitability and size are little different across this region. Interestingly, two countries that will be good choices for investment are the Philippines and Singapore because they give average highest return to common shareholders. On average, investors' expectation on firms' growth-opportunities are approximately twice the firms' book value. For the country-specific variable, the mean of interest rate during this period varies between 1% and 7.87%.

For the capital structures in ASEAN region, there is a significance difference between the five-year periods, supported by the Chow test. However, EPS, growth and interest rate are not significant in the latter period. The reason for the insignificant relationship may be that lenders have focused more on firms' revenues and tangible assets since the financial crisis period of 2008. Tangibility, profitability and size are the most important factors in determining firms' capital structure decisions because all these factors are significant and robust in both leverage ratios and throughout the period. Interest rates and country dummy variables show that there are significant differences across countries especially in the full period and from 2004 to 2009.

Significant positive relationships of tangibility and size on leverage are clearly explained by trade-off theory that fixed assets and firms' revenues reduce bankruptcy cost, cost of financial distress and agency cost of debt; therefore, these two factors increase the ability to obtain higher debt levels. Interestingly, a significant positive relationship between growth and leverage is influenced by the majority of low and medium growth firms supported by the high skewness of the data. Low to medium growth firms gain benefit more from borrowing than from issuing equity.

However, the trade-off theory fails to incorporate a significantly negative relationship between leverage and profitability. High profitability firms tend to be more concerned about the cost of

borrowing rather than the advantage of tax shield. Thus, pecking order theory plays a crucial role in elaborating negative relationship. Besides, the significant negative relationship of EPS is also more consistent with pecking order theory rather than trade-off theory. Managers prefer using retained earnings to achieve low cost of finance rather than borrowing more debt to maintain their own performance. An in-depth analysis of each country shows that firms' capital structure decisions are mainly driven by tangibility and profitability. These two variables are found to be significant in most of the countries and in both leverage ratios. Size, EPS and growth are significant only in some countries and not consistent for both leverage ratios. The determinants of capital structures can be explained quite well in Malaysia, the Philippines, Indonesia and Singapore because of their significant relationships in both leverage ratios.

In sum, the relationship between financial factors and firms' capital structures in AEC countries can be explained by trade-off theory. Tangibility, size, and growth play a crucial role in helping firms to reduce the cost of financial distress and achieve higher debt ratio. Nonetheless, tax shield advantages are less concern than cost of financing when firms have high profitability and high EPS. Thus, pecking order theory clarifies this negative relationship and enhances our understanding of ASEAN firm's capital structures. In country scale, the significant relationships of each variable on firm's capital structure are consistent and exhibit the same direction. Lastly, further study on the relationship between EPS and leverage should be conducted in order to confirm the results. Adding more variables and grouping by industries will help achieve a more complex model and a better explanatory power in this equation.

References

1. Modigliani F, Miller MH (1958) The cost of capital, corporation finance and the theory of investment. Am Econ Rev 48: 261-297.

2. Modigliani F, Miller MH (1963) Corporate income taxes and the cost of capital: a correction. Am Econ Rev 53: 433-443.

3. Jensen M, Meckling W (1976) The theory of the firm: managerial behavior, agency costs and ownership structure. J Financ Econ 3: 305-360.

4. Myers SC (1984) The capital structure puzzle. J Finance 39: 574-592.

5. Baker M, Wurgler J (2002) Market timing and capital structure. J Finance 57: 1-32.

6. Titman S, Wessels R (1988) The determinants of capital structure choice. J finance 43: 1-19.

7. Rajan RG, Zingales L (1995) What do we know about capital structure? Some evidence from international data. J Finance 50: 1421-1460.

8. ASEAN (2015) Economic community blueprint.

9. Kraus A, Litzenberger RH (1973) A state-preference model of optimal financial leverage. J Finance 28: 911-922.

10. Harris M, Raviv A (1991) The theory of capital structure. J Finance 46: 297-355.

11. Myers SC, Majluf NS (1984) Corporate financing and investment decisions when firms have information that investors do not have. J Financ Econ 13: 187-221.

12. Frank MZ, Goyal VK (2009) Capital structure decisions: which factors are reliably important? Financial Management 38: 1-37.

13. Vithessonthi C, Tongurai J (2015) The effect of firm size on the leverage–performance relationship during the financial crisis of 2007–2009. Journal of Multinational Financial Management 29: 1-29.

14. Pinches GE, Mingo KA (1973) A multivariate analysis of industrial bond ratings. J Finance 28: 1-18.

15. Remmers L, Stonehill A, Wright R, Beekhuisen T (1974) Industry and size as debt ratio determinants in manufacturing internationally. Financial Management 3: 24-32.

16. Deesomsak R, Paudyal K, Pescetto G (2004) The determinants of capital structure: evidence from the Asia Pacific region. Journal of multinational financial management 14: 387-405.

17. Smith CW, Watts RL (1992) The investment opportunity set and corporate financing, dividend, and compensation policies. J Financ Econ 32: 263-292.

18. Jensen MC (1986) Agency cost of free cash flow, corporate finance, and takeovers. American Economic Review.

19. Taggart RA (1977) A model of corporate financing decisions. J Finance 32: 1467-1484.

20. Merton RC (1974) On the pricing of corporate debt: The risk structure of interest rates. J Finance 29: 449-470.

21. Gujarati ND, Porter CD (2009) Basic econometrics.

22. Kmenta J (1986) Elements of econometrics. New York: Macrnilian.

23. Intercapital (2015) Interpretation of Skewness and Kurtosis.

24. Brown S (2015) Measures of shape: Skewness and Kurtosis.

25. Chen L, Zhao X (2006) On the relation between the market-to-book ratio, growth opportunity, and leverage ratio. Financ Res Lett 3: 253-266.

26. Huynh KP, Petrunia RJ (2010) Age effects, leverage and firm growth. J Econ Dyn Control 34: 1003-1013.