Sectorial-Specific Capital Structure Determinants - Evidence from Bursa Malaysia

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This paper investigates the relevance of traditional and modern capital structure theories in explaining capital structure determinants of listed firms in Bursa Malaysia. Within the framework of Modigliani-Miller, Trade-Off, Pecking-Order and Dynamic Capital Structure theories, this paper employs Generalized Method of Moments (GMM) as an estimation model on yearly panel data from 2005 through to 2016. The test results from GMM show that Dynamic Capital Structure is the most prominent among all, followed by the Trade-Off Theory. Interestingly, current asset is the only determinant of capital structure for the technology sector, implying the importance of asset quality in this industry. Profitability is the most prevalent and significant variable that determines the choice of capital structure in Plantation, Industrial Products and Trading & Services sectors.

Key words: *Modigliani-Miller Theory; Trade-Off Theory; Generalized Method of Moments; Panel Data Analysis; Capital Structure Determinants.*

Introduction

Malaysia used to be one of the 'Asian tigers' and its stock market was one of the highest growth exchanges in Asia during 1990s. Today, the Malaysian economy is mostly driven by its manufacturing, oil & gas and palm oil plantation sectors. The manufacturing, services and mining sectors have been the engine room, supporting Malaysia economic growth since 1980s. Ever since, Malaysia has become a strong trading nation with a consistent record of trade surpluses. The Asian Debt Crisis (1997-1998) was a real test pad for Malaysian policy makers and businesses. The lessons learnt from this economic turbulence are a plenty. The plantation sector was contributing the most during the early stage of the crisis. The crude

palm oil (CPO) recorded higher prices and supported the demand for Ringgit (Malaysia domestic currency).

Besides the plantation sector, the property and construction sectors subsequently came in to turnaround the declining economic activities. Some drastic economic policies were introduced by the central bank of Malaysia to increase money supply and consequently stimulate aggregate demand. As a producer and exporter of crude oil, natural gas, and palm oil, Malaysia's economy was once again put to test during the peak of the commodities crisis in 2015. Net external demand pushed down the growth of Malaysia gross domestic products (GDP) in the first half of 2015. During the third quarter of 2015, the Ringgit was the worst performer against the U.S dollar among other Asian currencies. This volatile financial scenario has triggered deep concerns over the need to diversify the Malaysia economy into technology and services sectors. Like China, Malaysia adopts digital technology as the key enabler to this economic transformation.

Business globalization and volatile regional financial markets have become a great challenge to Malaysian companies in sustaining their growth, particularly in being continuously competitive. The cost of financing has become one of the major hurdles not only for the SMEs but also the public listed companies. Capital structure is regarded as one of the important elements in corporate finance that helps contribute towards sustaining business growth and maximizing firm's value in the long run. The choice of financing will determine the firm's risk-return profile and directly provide risk exposure to the existing shareholders as well as the stakeholders. In other words, managing a firm at optimal capital structure level is a must on the condition that business growth is sustained while cost of financing is minimized. However, financial managers need to be aware of the potential danger associated with their choice of financing because each source of financing has its own individual advantages and disadvantages which require special attention.

Many studies have been carried out around the world to investigate the theoretical link between a firm's capital structure and its performance as well as asset quality. This study is unique in that it considers the seven critical sectors from Bursa Malaysia that have been supporting Malaysian economic growth throughout the periods of recession and economic boom. It is indeed important to understand the firm's specific factors and their relationship with overall structure of business financing. In general, companies from different sectors or industries are characterized by different market dimensions, profitability and asset quality. For this reason, it is important to find out what are the key factors behind Malaysia's resilient industries which are mostly funded by Bursa Malaysia, the Malaysian stock exchange established in 1964.

Literature Review

There are several significant capital structure theories that have emerged and caught the attention of many scholars and researchers (Kovenock and Phillips, 1995; Kovenock and Phillips, 1997). The traditional theory of capital structure tells us that wealth is not just created through investments in assets that yield positive return on investment; purchasing those assets with an optimal blend of equity and debt is just as important. This theory believes that when the Weighted Average Cost of Capital (WACC) is minimized, then the market values of assets are maximized. Subsequently, an optimal structure of capital will resurface.

The modern theory of capital structure begins with the celebrated paper of Modigliani and Miller. A firm's capital structure is the relative proportions of debt, equity, and other securities in financing its total assets. A business needs to plan its capital structure so as to optimize the application of funds and in turn able to adjust easily to the changing environments. Essentially, Modigliani and Miller hypothesize that in perfect markets, it does not matter what capital structure that a company uses to finance its operations. They advocate that the market value of a firm is determined by its earning power and the asset risk. The basics of Modigliani and Miller proposition is based upon six key assumptions; (1) No taxes (2) No transaction costs (3) No bankruptcy costs (4) Equivalence in borrowing costs for both companies and investors (5) Symmetry of market information, meaning that both companies and investors have the same set of information (6) No effect of debt on a company's earnings before interest and taxes.

Besides Modigliani and Miller theory, the Trade-Off theory is another celebrated capital structure theory which is still relevant today. The theory simply explains that any company will select a preferred mix of debt and equity financing by balancing out their individual costs and benefits. This theory is also known as a Static Theory and it assumes that companies will benefit from their leverage activities within a capital structure until the optimum capital structure is achieved. The theory acknowledges the tax advantage derived from interest payments but the risks associated with leverage are translated into bankruptcy and agency costs.

The relationship between capital structure and company performance is still debatable as many previous studies have concluded diverse findings. Some of the studies find that there is a significant negative relationship between leverage and the firm's performance (Krishnan and Moyer, 1997; Zeitun and Tian, 2007). Similar finding has been observed in several countries as conducted by other researchers (Brigham & Gapenski, 1996; Majumdar and Chhibber, 1997; Rao, Al-Yahyaee and Syed, 2007). Specifically, Gleason, Mathur and Mathur (2000) have found negative relationship between firm's performance and different

types of combination in capital structure. The issue of understanding the relationship between the firm's performance and different combination in capital structure has been associated with the changes in economic conditions, especially during Asian financial crisis in 1997 (Tan, 2012). His study points out that the negative relationship between the firm's performance and the financial risk stems from excessive leverage before the time of financial crisis.

Interestingly, there are earlier studies that indicate different direction of the relationship between the firm's performance and financial leverage. Most of these studies point out that financial leverage would contribute positively towards improving the performance of the firms as reflected in the increase of productivity level, which in turn enhance the firm's profitability over time (Huyghebaert, 2006; Titman and Wessels, 1998; Myers, 2001; Ross, 1977; Noe, 1988). Some previous studies have also confirmed similar results that firm's value has been positively influenced by certain mix of capital structure which is closer to the optimum level (Maksimovic, Stomper and Zechner, 1999; Barclay, Smith and Watts, 1995). Technically, an optimum capital structure is an ideal point where firms are able to minimize their overall cost of financing coupled with maximization of firm's value (Hadlock & James, 2002; Corriceli, Driffield, Pal, and Roland,2011). Leverage or debt financing does exert some positive influence on increasing the firm's value since profitability is the key enabler for firm's long run financial sustainability and growth (Roden and Lewellen, 1995; Sharma, 2006; Ehrhardt and Brigham, 2006)

Data and Methodology

This study focuses on seven sectors at Bursa Malaysia as shown in Table 1 below. The raw data are extracted from Bloomberg and the yearly panel data are analyzed from 2005 through 2016. There are seven variables to be scrutinized in this study namely; debt-equity ratio, total assets, fixed assets, current assets, sales, return on equity and earnings per share. In analyzing the panel data, SAS program is deployed.

Table 1: Seven Sectors at Bursa Malaysia

No.	Sector	Market Category
1	Consumer Products	Main Market
2	Industrial Products	Main Market
3	Construction	Main Market
4	Property	Main Market
5	Plantation	Main Market
6	Technology	Main Market
7	Trading and Services	Main Market

Generalized Method of Moments (GMM) is mobilized as an estimation model for testing the determinants of a firm's capital structure across the seven sectors. This method provides the panel data with efficient econometric estimators. GMM is a dynamic estimation model that embraces panel data and capable of reducing and easing up the endogeneity problem. Endogeneity is the correlation between the parameters or variables with the error term. This GMM approach controls the endogeneity problem by employing unobservable shocks in the cross-sectional component. To ensure the validity of GMM results, two important diagnostic tests are performed – serial correlation test on the error terms and the test for exogeneity of the instruments via Sargan test. The GMM procedure is summarized in Figure 1 below. The GMM approach is commendable because it improves estimation efficiency by reducing the multicollinearity problem and increasing the degree of freedom between the explanatory variables. Also, GMM embraces panel data approach that yields the advantage of solving unobserved firm-specific effects. In short, GMM is a method that alleviates the deformation caused by fixed effects, simultaneity and endogeneity. The study applies the GMM approach that considers both dimensions of cross-sectional and time-series data.

Figure 1. Generalized Method of Moments (Process and Procedure).
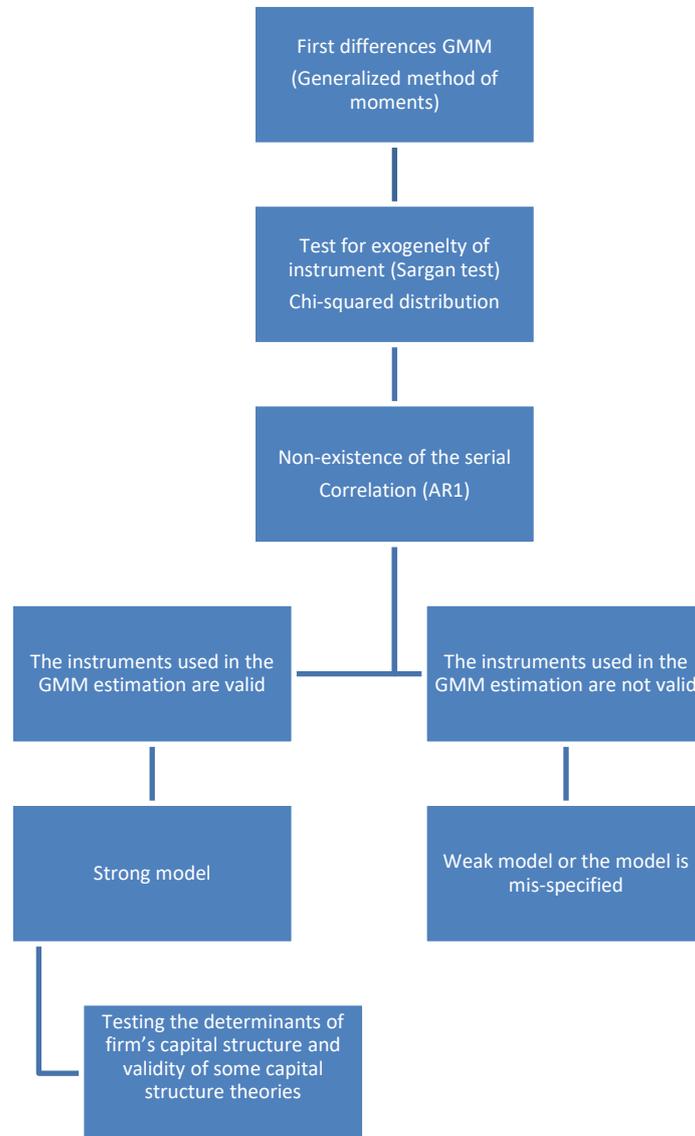
In addressing the problem of endogeneity, involving independent and explanatory variables, a two-step GMM method is used to control the correlation error over time, that is, mitigating the effect of orthogonality conditions on errors, and heteroskedasticity across firms. Observed and unobserved firm-specific determinants determine the optimal capital structure. These firm and time specifics do changes on capital structure and the optimal leverage point. Depending on the determinants of capital structure, the following GMM model is developed:

$$Y^*_{it} = \square_0 + \sum_k \beta_k X_{kit} + \square i + \square t + \square it \ \ldots\ldots\ldots\ldots\ldots \ (1)$$

Where: Y* = the dependent variable

i=1,….., N.

Firm-specific characteristics are measured by $\sum k \ \beta k \ X_{ki_t}$, and the result varies from time to time and from firm to other.

α_i is the unobserved firm- specific effect,

α_t captures the time effect.

The lagged values of the dependent variable of the GMM model are examined to evaluate the consistency and the validity of the other explanatory variables. The error terms must not exhibit any serial correlation. Serial correlation is often observed in time series data, but not in cross-section. Due to this limitation, the panel data approach is recommended. In order to avoid the problem of serial correlation, the first and second order serial correlation test is conducted. The AR1 and AR2 must provide a negative significant results and no evidence of second order autocorrelation. The error is assumed to be independent of its past and it has no memory of its past values.

The Sargan test (1958) is proposed by John Denis Sargan and occasionally referred to as the Hansen test or J-test. It is used to examine the exogeneity of the instruments and their consistency. It is aimed at exploring variables and finding out whether they are uncorrelated to some sets of residual. If the Sargan test is not valid, the model is classified as weak. The degrees of freedom are found by calculating the difference between the number of instruments and the number of regressors. The GMM is used to generate consistent and efficient estimators of the parameters in this study.

Empirical Findings

The empirical findings of this study are summarized in Table 2 below. Specifically, Table 2 demonstrates the parameter estimates and their level of significance for the first three sectors – Property, Construction and Industrial Products. Looking at the lagged dependent variable across the three sectors, it is clear that the Dynamic Capital Structure does exist with their individual speed of adjustment moving towards the target capital structure at relatively fast pace ranging between 0.20 and 0.39. It is interesting to note that tangibility (as measured by TA, FA, and CA) shows a consistently positive significant relationship with firm's leverage. This positive relationship is expected because any increase in the value of assets will entice firms to take up more debt. Sales and profitability (as measured by ROE and EPS) seem to be a significant determinant of capital structure for Construction and Industrial Products sector respectively.

Table 2: Dynamic GMM Analysis across Property, Construction and Industrial Products Sectors

Sector	Property		Construction		Industrial Products	
Variable	Estimate	P-value	Estimate	P-value	Estimate	P-value
Intercept	0.0035	0.9314	-0.0569	0.0002	-0.0570	0.0002
lde_1	0.2412	0.0082**	0.3970	0.0001**	0.1978	0.0118**
ltasset	0.4057	0.3508	1.1823	0.0004**	0.9146	0.0210**
lfasset	0.3675	0.0001**	0.1465	0.0051**	0.1060	0.0001**
Lca	0.2382	0.4486	0.3324	0.0002**	0.3187	0.3390
lsales	-0.1283	0.1027	-0.2725	0.0005**	0.2208	0.1092
Lroe	-0.0927	0.5083	0.0101	0.8731	0.3501	0.0094**
Leps	-0.0729	0.5617	-0.0142	0.8517	-0.3106	0.0320**

**significant at 5%*

Table 3 presents the parameter estimates of four more sectors of Bursa Malaysia namely, Technology, Trading & Services, Consumer Products and Plantation sectors. The capital structure behaviour of these four sectors does not vary much as compared to the first three sectors. The Dynamic Capital Structure theory is still dominant across these four sectors as their individual speed of adjustment moves at even a faster pace, ranging between 0.20 and 0.58. Needless to say, this target capital structure approach does exist across these seven sectors and in line with the results of earlier studies by Haron and Ibrahim (2012) and Ting (2016).

As a traditional determinant of capital structure, tangibility still holds significant explanatory power over capital structure variations of these four sectors. This finding confirms the work of Wahab and Ramli (2014). Lastly, it is worthwhile to note that there is a significant negative relationship between EPS and firm's leverage at plantation sector. This finding is consistent with the study of Ling and Lean (2011) suggesting that any significant improvement in firm's profitability will undoubtedly reduce its dependency on borrowings.

Table 3: Dynamic GMM Analysis across, Technology, Trading & Services, Consumer Products and Plantation Sectors

Sector	Technology		Trading & Services		Consumer Products		Plantation	
Variable	Estimate	P-Value	Estimate	P-Value	Estimate	P-Value	Estimate	P-Value
Intercept	-0.2506	0.0054	-0.0371	0.0705	-0.0819	0.0001	-0.0314	0.0001
lde_1	0.3835	0.0523*	0.2547	0.0017**	0.2020	0.0062**	0.5794	0.0001**
Ltasset	1.5594	0.1439	1.0393	0.0001**	-0.2690	0.4901	0.3100	0.0170**

Lfasset	0.3597	0.1346	-0.3196	0.0009**	0.5211	0.0001**	0.0351	0.1535
Lca	1.1056	0.0054**	-0.2792	0.1501	1.3431	0.0001**	0.0888	0.0001**
Lsales	-0.0162	0.9630	0.2319	0.1134	-0.0187	0.8749	0.0497	0.4426
Lroe	-0.0601	0.8446	0.2097	0.0053	0.1342	0.4563	0.0402	0.5362
Leps	0.2480	0.4516	-0.0377	0.2734	-0.2000	0.1505	-0.1232	0.0211**

**significant at 5%, *significant at 10%

Technically, the estimated models in this study are free from any diagnostic issues. From Table 4, we can see that the null hypothesis of correct model specification and absence of autocorrelation from respective Sargan test and the AR(m) test cannot be rejected at all (see the p-value). These test results strongly support that those dynamic panel data models are correctly specified and therefore the parameter estimates are valid.

Table 4: GMM's Diagnostic Tests

Diagnostic Test	Property	Construction	Industrial Products	Technology	Trading & Services	Consumer Products	Plantation
Sargan Test (Prob >ChiSq)	0.6986	0.7309	0.7868	0.9998	0.7802	0.5434	0.5920
AR(m) Test (Prob>Statistic	0.8710	0.6647	0.9998	0.2283	0.9855	0.9955	0.9941
Number of cross sections	46	27	127	17	102	80	36

Conclusion

Despite the puzzle surrounding the mixed results of capital structure studies around the world, this paper strives to provide an in-depth understanding on the relationship between Malaysian firm-specific variables and their debt-to-equity mix. This paper investigates the relevance of classic and modern capital structure theories in explaining capital structure determinants of listed firms at Bursa Malaysia. Within the framework of Modigliani-Miller, Trade-Off, Pecking-Order and Dynamic Capital Structure theories, this study employs Dynamic Generalized Method of Moments (GMM) as an estimation model on yearly panel data from 2005 through to 2016. The test results from GMM show that Dynamic Capital Structure is the most prominent among all, followed by the Trade-Off Theory. Interestingly, current asset is the only significant determinant of capital structure for the technology sector,

implying the importance of asset quality in this industry. Profitability is the most prevalent and significant variable that determines the choice of capital structure in Plantation, Industrial Products and Trading & Services sectors.

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