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Determinants of Capital Structure for Philippine Publicly-listed Companies

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Abstract

All entities have limited resources and management is expected to exercise prudence in its allocation to activities which would impact the overall standing of their respective organizations. However, proper allocation of resources is just one side of the coin and it can't be done if businesses do not even have any resource to allocate at all.

The sources of an entity's funds, both borrowed capital from creditors as well as the invested capital from and earned capital of shareholders, must also be considered in the decision-making process of the management

The dataset used contained financial data of 179 publicly listed firms (excluding banks and other financial institutions) in the Philippine Stock Exchange (PSE) for the periods 2012 to 2016. Panel data regression was used to come up with the results of this study.

This study concluded that in the Philippines, size and growth are considered determinants of capital structure. Both of them have positive effects on the capital structure of the firm measured in terms of total debt.

Keywords: *Capital Structure, Size, Growth*

Introduction

Organizations, specifically businesses, struggle and undergo several challenges nowadays. As the world becomes smaller each day with the aid of technology, the management of each respective businesses continuously formulate strategies to respond and cope with the demands of its various stakeholders. To satisfy these stakeholders, businesses constantly look for ways to improve its existing products and services in the market. With the principle that all business entities have limited resources, management is therefore expected to exercise prudence in the allocation of resources to activities which would impact the overall standing of their respective organizations.

However, focusing on the proper allocation of resources is just one side of the coin. Proper allocation can't be done if businesses do not even have any resource to allocate at all. Although the proper use of funds would greatly affect an entity's current and future performance, attention should also be given to the manner in which these resources have been raised as well as its subsequent impact to the entity. The sources of an entity's funds, both borrowed capital from creditors as well as the invested capital from and earned capital of shareholders, must also be considered in the decision-making process of the management.

Pecking Order Theory

Generally, there are three sources of funds available to firms – retained earnings, debt, and equity. While the pecking order theory has long roots in the descriptive literature, it was clearly articulated by Myers (1984). The pecking order theory primarily suggests a financing hierarchy wherein managers prioritize the utilization of internal funds to finance investment, the issue debt and also equity as a last resort. From the perspective of those inside the firm, retained earnings are a better source of funds than outside financing, thus, used when possible. If retained earnings are inadequate, debt financing will be used, then equity. This is a theory of leverage in which there is no notion of an optimal leverage ratio (Frank & Goyal, 2009).

Theory of Trade-off

The trade-off theory focuses on taxes and bankruptcy costs. (Frank & Goyal, 2007) According to the trade-off theory, capital structure is determined by a trade-off between the benefits of debt and the costs of debt. The benefits and costs can be obtained in a variety of ways. (Frank & Goyal, 2009)

Similar Studies Conducted

Several studies had been conducted to identify the determinants of capital structure. Almost all of these studies were anchored on these two popular theories – Pecking Order Theory and Theory of Trade-off. In corporate finance, pecking order theory (or pecking order model) postulates that the cost of financing increases with asymmetric information. Financing comes from three sources, internal funds, debt and new equity. On the other hand, the trade-off theory of capital structure refers to the idea that a company chooses how much debt finance and how much equity finance to use by balancing the costs and benefits.

Most of the related studies used the debt ratio as their dependent variable to signify capital structure. Deesomsak, Paudyal, & Pescetto (2004) investigated the determinants of capital structure of firms operating in the Asia Pacific region, in four countries with different legal, financial and institutional environments, namely Thailand, Malaysia, Singapore and Australia. Overall, the results support existing evidence with respect to firm-specific determinants. Specifically, they observed that the positive effect of firm size and the negative effect of growth opportunities, non-debt tax shield, liquidity and share price performance on leverage lend support to major capital structure theories. Furthermore, the importance of the determinants of capital structure varies across countries in the region. The capital structure decision is not only the product of the firm's own characteristics but also the result of the corporate governance, legal framework and institutional environment of the countries in which the firm operates.

In the empirical study of Matias & Serrasqueiro (2017) on the reliable determinant factors of capital structure decisions for SMEs in different regions in Portugal, it was noted that size, age, asset tangibility and profitability are reliable in explaining Portuguese SMEs' capital structure decisions. The aforementioned study also presented a summary of empirical studies made by several researchers on Portuguese SMEs. On the other hand, Kayo & Kimura (2011) stated that two firm variables – tangibility and size – show a positive and significant relationship with leverage whereas two other variables – growth opportunities and profitability showed a negative and significant relationship with leverage.

Serghiescu & Văidean (2014) conducted an empirical analysis on the relative importance of five factors upon the capital structure decisions of Romanian firms listed at the

Bucharest Stock Exchange and operating in the construction sector of the industry. The results show that profitability and liquidity ratios are negatively affecting the total debt ratio of Romanian companies. The tangibility of assets is also having a negative impact on leverage, strengthening the findings of previous empirical studies which claim that this indicator moves in opposite direction with the debt ratio of companies located in developing countries. On the other hand, the size of a company and its asset turnover have a positive correlation with leverage. The explanatory variable which has the highest impact on the capital structure choices is profitability.

In Thailand, an empirical study was presented by Wiwattanakantang (1999) on the determinants of the capital structure of listed Thai firms. Measures of the traditional factors that are hypothesized to affect financing decisions, namely profitability, tangibility, taxes, and growth are all significant. In addition, factors that are related to governance mechanisms of Thai firms also have influence on the debt policy choices. Empirical results imply that the tax effect, the signaling effect, and the agency costs play a role in financing decisions. Ownership structure also effects financial policy. Thippayana (2014) made a more recent study on the determinants of capital structure and noted that for listed companies in Thailand stock exchange market, firm size has a positive and significant relationship on leverage while profitability has a negative and significant relationship with leverage.

In India, Handoo & Sharma (2014) concluded that factors such as profitability, growth, asset tangibility, size, tax rate and debt serving capacity have significant impact on the leverage structure chosen by firms in Indian context. Growth and asset tangibility have positive effect on debt while profitability, size, tax rate and debt serving capacity have negative effect.

A similar study was also conducted by Chen (2004) in China which resulted into a so called "new Pecking order" – retained profits, equity and long-term debt. There were two significant explanatory variables which have positive relationship to debt namely growth opportunity and tangibility. On the other hand, profitability has a negative and significant relationship to debt. The results imply that significant institutional differences such as the legal system governing companies' operation and banking and securities markets, ownership concentration and the corporate governance structure of the listed firms, the agency problems inheriting from public ownership, and the financial constraints in the banking sector are all factors influencing the roles of firm-specific factors on firms' leverage decision. Huang & Song (2006) found that leverage in Chinese firms increased with firm size and fixed assets while decreases with profitability, non-debt tax shields, growth opportunity, managerial shareholdings and correlates with industry.

The most recent study conducted in China by Chang, Chen, & Liao (2014) included a comparison of selected studies about the determinants of Chines capital structure. Several variables were presented in the comparative summary to show the difference of his study with the existing studies including the two abovementioned studies. The said study identified seven reliable core factors explaining book value leverage: profitability, industry leverage, asset growth, tangibility of assets, firm size, state-control dummy and the largest shareholding.

Güner (2016) examined the capital structure determinants for listed non-financial Turkish firms. Results revealed that although pecking order theory better describes the capital structure of Turkish firms, some of the capital structure determinants are in accordance with trade-off theory. Furthermore, this study investigates the differences in degrees of leverage, regardless from estimated capital structure model, for different levels of free float rate, foreign
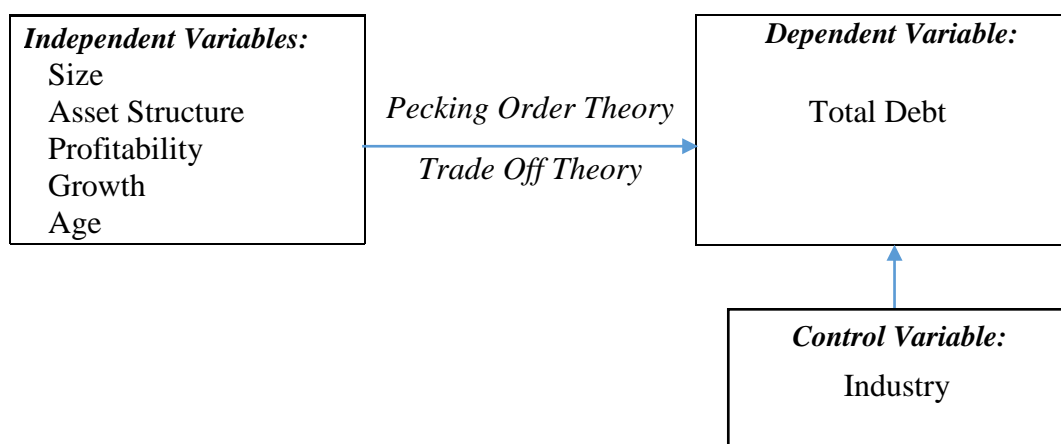
paid in capital and for different market values of the firms are graphed to exploit the differences in capital structure decisions.

Although a lot of studies have been made all over the world, and only a few has been done in the Philippines. Hence, this study was conducted. The outcome of this study is expected to be somehow different from the findings of previous literature which can be attributed to the variations in the business environment. As such, the result of this study would add to the current pool of literature about the determinants of capital structure in the Philippine setting. The result that would be generated in this study can also be the subject matter of further research studies focusing on a deeper and more complex analysis of the capital structure determinants.

Framework

The literature on capital structure identifies various variables related to the firm capital structure decisions (Frank & Goyal, 2007). However, Frank & Goyal (2009) identified a small number of factors that are empirically robust and financially important: profitability, age, size, asset tangibility and growth, in explaining firm capital structure decisions. The same variables were used by Matias & Serrasqueiro (2017).

Most of the literature used publicly-listed entities as their sample population but didn't consider the impact of the industry or sector to which such entities belong. Hence, this study added industry as a control variable that would fix or eliminate the contributing factor of industry in order to clearly identify the effect of the independent variables on the dependent variable.

Independent Variables:		*Dependent Variable:*
Size	*Pecking Order Theory*	
Asset Structure		Total Debt
Profitability	*Trade Off Theory*	
Growth		
Age		

Control Variable:
Industry

Figure 1. Schematic Diagram of Operational Framework of the Study

Methodology

The dataset used contained financial data of 179 publicly listed firms in the Philippine Stock Exchange (PSE) for the periods 2012 to 2016. The dataset used in this study was downloaded from the Osiris database and from the website of Philippine Stock Exchange (PSE). Firm data for banks and other financial institutions were excluded due to differences in financial structure and accounting procedures. This study also excluded companies with incomplete data.

In order to make the comparative analyses between capital structure theories of tradeoff and pecking order and exploit the significance of capital structure the determinants, the regression model adopted from the study of Matias & Serrasqueiro (2017) model was used in this study:

$$TD_{it} = \beta_1 + \beta_2 SIZE_{it} + \beta_3 AS_{it} + \beta_4 PROF_{it} + \beta_5 GROW_{it} + \beta_6 AGE_{it} + \beta_7 IND_{it} + u_{it}$$

Table 1. Variable Definitions

Variables	Definition	Measure
Dependent:		
TD	Total Debt	Total liabilities/Total Assets
Independent:		
SIZE	Size	Natural logarithm of Total Assets
AS	Asset Structure	Tangible Fixed Assets/Total Assets
PROF	Profitability	Earnings Before Interest and Tax /Total Assets
GROW	Growth	(Total Assets$_{i,t}$ - total Assets$_{i,t-1}$)/Total Assets$_{i,t-1}$
AGE	Age	Natural logarithm (year of data - year of incorporation)
Control:		
IND	Industry	Dummy Variable 1=Services, 2 = Properties, 3=Holding, 4=Industrial, 5=Mining & Oil, 6=SME
I1	Industry 1	Services
I2	Industry 2	Properties
I3	Industry 3	Holding
I4	Industry 4	Industrial
I5	Industry 5	Mining and Oil
I6	Industry 6	SME

Discussion of Results

The stata output showing the identification of the variables that indicate the cross section observations (i) and the time series observations (t) is presented in Appendix A. The stata output for the summary of data gathered is presented in Appendix B. Table 2 presents the descriptive statistics of the different continuous variables in this study.

Table 2. Descriptive Statistics

Variables	Mean	Std. Deviation	Min	Max
TD	.4697478	.5517398	.0008455	7.190925
SIZE	22.84229	2.206883	16.62	27.99
AS	.2599665	.2408233	0	.94
PROF	.0563464	.0965626	-.56	.76
GROW	.9106779	12.96059	-.6308187	274.8101
AGE	3.492782	.7380764	0	4.73

In order to determine the best panel regression model for the study, the models of panel data regression were calculated using stata: the Naïve Model/Pooled Ordinary Least Squares, the Lease Squares Dummy Variable (LSDV) model and the Random Effects Model (REM). Statistical tools were employed to determine which among the three panel regression models would be the most appropriate for this study.

The Variance Inflation Factor (VIF) was used to test of the presence of severe multicollinearity. The estimation method chosen is validated by the White and Modified Wald tests (tests of heteroscedasticity), Breusch-Pagan Lagrange Multiplier (LM) (test of firms' individual effects), Robust Hausman (test of fixed effects versus random effects) and Wooldridge (autocorrelation test).

The Wald's test was used to compare the LSDV1 vs. OLS, LSDV2 vs. OLS, LSDV3 vs. OLS and LSDV1 and LSDV3. Afterwards, the Breusch and Pagan Lagrangian (BPLM) multiplier test for random effects was used to compare the naïve regression model and Random Effects Model (REM).

As the LSDV 1 and REM were better models than the naïve regression model using different statistical test, the Hausman Specification test was employed to determine which between the LSDV1 and REM should be used in the study. This test examined the collinearity of individual effects with other dependent variables in the model and determined whether there was a significant evidence that the error term were correlated with the regressors.

After these tests, the REM was found to be the most appropriate model for this study. The table below presents the final regression result under the random effects model after robust. Only two variables - Size and Growth, were found to be significant. Furthermore, these two items both have a positive effect on an entity's capital structure. Appendix C provides the complete result from stata.

Table 3. Regression Result after using robust

Independent Variables	Coefficient	P-value
SIZE*	.0573783	0.015
AS	.1740607	0.050
PROF	-.03767	0.709
GROW*	.0015087	0.005
AGE	-.0228128	0.679

significant at 0.05 level

Conclusions

This study concluded that in the Philippines, size and growth are considered determinants of capital structure. Both of them have positive effects on the capital structure of the firm measured in terms of total debt. Other variables – asset structure, profitability, growth and age have were found to be insignificant in the Philippine setting.

The results generated showed that entities with greater amount of assets tend to finance such through debt. Furthermore, as firms grow in terms of its assets, the capital structure in the form of debt also increases. Both effect/sign of these two significant variables supports the a-priori expectations set in the previous literature. This can be attributed to the current development of the Philippine listed corporations as they expand their operations.

Other variables were found to be insignificant because the primary consideration for resorting to debt financing tends to arise from the need of entities to increase their resources to support expanding operations. When firms are profitable, they would have enough resources to support expansion through the use of retained earnings financing/appropriation. The form of asset – tangible or not, was found to be insignificant since financing is not necessarily done only for capital expenditures alone, but also for some working capital requirements as in the case of expanding operations. The firm age was found to be insignificant as well because the samples (listed companies), whether new or not in the industry, have greater access to debt and equity financing as compared to that of SMEs and other non-listed corporations.

The results also suggest that in the Philippines, the pecking order theory is being observed as a way of financing capital requirements because raising capital through debt rather than issuance of equity instruments is a usual practice among entities.

For the management for firms, it is recommended that they assess if the debt financing would be of benefit to the entity, particularly considering the risks involved and the perceived return. Firms who would want to expand operations must consider the trade-off theory in determining the portion that would be financed by debt. Also, following the pecking order theory, it is recommended that firms exhaust first internal financing before considering the issuing debt and equity securities. Although the use of debt financing would impose certain restrictions on the entity's capability to manage their assets, the decision to raise fund from such source would somehow be compensated by the lower cost of capital as compared to new equity issuances. Also, the interest costs incurred by the entities would benefit the company in the form of tax savings since interest, to a certain extent, is considered tax deductible.

For the investors – both local and global, it is recommended that they determine the capital structure of entities that they would want to invest into and assess the risks involved in entities which are highly leveraged. Moreover, investors need to consider the growth in terms of assets as this would entail additional financing needs which might create risk on the part of investors. If they want to be on the more conservative side, they may want to invest in companies with not too much debt since this would reduce the risk associated with bankruptcy. Considering the trade-off theory (balance between the benefits of debt and cost of debt) investors may want to choose firms with lower debt ratio. On the contrary, aggressive investors may want to invest in firms which are highly leveraged since the risks they take could be compensated by higher returns.

Limitations and Recommendations for future research

This study involves the available financial information of various firms in the Philippine Stock Exchange for a limited time frame of five years, from 2012 to 2016. This includes entities which were listed prior to 2012 and continues to be listed at least until the end of December 2016.

However, this study excludes the financial sector because the capital structure of this industry is unique and highly specialized in nature such as banks which relies heavily on deposits.

For the future researchers, it is recommended that a study be conducted on a regional level, e.g. ASEAN, to further expand the scope of the study. They may also use longer time period as well and increase the number of variables that would make the study more relevant.

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Appendix

Appendix A: Identification of the variables

```
. xtset  company year
        panel variable:  company (strongly balanced)
         time variable:  year, 2012 to 2016
                 delta:  1 unit
```

Appendix B: Summary of dataset content

```
. su
```

Variable	Obs	Mean	Std. Dev.	Min	Max
company	895	90	51.70093	1	179
year	895	2014	1.415004	2012	2016
industry	895	2.810056	1.394183	1	6
td	895	.4697478	.5517398	.0008455	7.190925
size	895	22.84229	2.206883	16.62	27.99
as	895	.2599665	.2408233	0	.94
prof	895	.0563464	.0965626	-.56	.76
grow	895	.9106779	12.96059	-.6308187	274.8101
age	895	3.492782	.7380764	0	4.73
i1	895	.2681564	.4432472	0	1
i2	895	.1675978	.3737175	0	1
i3	895	.1564246	.3634605	0	1
i4	895	.3072626	.4616171	0	1
i5	895	.0949721	.2933403	0	1
i6	895	.0055866	.0745761	0	1

Appendix C: Final Regression Result after Robust

```
. xtreg td size- age i1 i2 i3 i5, re robust

Random-effects GLS regression              Number of obs      =        895
Group variable: company                    Number of groups   =        179

R-sq:  within  = 0.1261                     Obs per group: min =          5
       between = 0.0002                                    avg =        5.0
       overall = 0.0008                                    max =          5

Random effects u_i ~ Gaussian              Wald chi2(9)       =      70.76
corr(u_i, X)      = 0 (assumed)            Prob > chi2        =     0.0000

                        (Std. Err. adjusted for 179 clusters in company)
------------------------------------------------------------------------------
             |             Robust
         td  |    Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        size | .0573783   .0235753     2.43   0.015     .0111716    .1035851
          as | .1740607   .0887929     1.96   0.050     .0000298    .3480916
        prof | -.03767    .1008772    -0.37   0.709    -.2353857    .1600456
        grow | .0015087   .0005408     2.79   0.005     .0004488    .0025687
         age | -.0228128  .0550457    -0.41   0.679    -.1307003    .0850747
          i1 | .06297     .1397884     0.45   0.652    -.2110103    .3369503
          i2 | -.0601962  .0557954    -1.08   0.281    -.1695531    .0491607
          i3 | -.0561591  .1177561    -0.48   0.633    -.2869569    .1746387
          i5 | -.2028838  .0633673    -3.20   0.001    -.3270813   -.0786862
        _cons| -.7844701  .4566603    -1.72   0.086    -1.679508    .1105676
-------------+----------------------------------------------------------------
     sigma_u | .54796677
     sigma_e | .10380865
         rho | .96535461   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```