

**THE DETERMINANTS OF CAPITAL STRUCTURE: NEW
EVIDENCE FROM THE PHILIPPINES**

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ABSTRACT

This study investigates how listed firms in Philippines determine their capital structure in the aftermath of Asian Financial Crisis 1997. By employing panel data to a sample of 169 listed firms from year 2000-2010, the results indicate that firms have learnt from the pitfalls of excessive debts during the Crisis with average debt ratio of 23.82% for the period understudy. Both organizational factors and environmental factors are reported to have explanatory power on the capital structure decision. The findings also reveal that firms in Philippines faced difficulties in raising external capital and hence, rely more on internal funds.

KEYWORDS - Determinants of Capital Structure, Philippines' Institutional Setting.

1. INTRODUCTION

Capital structure is one of the most important strategic financial decisions. A combination of different sources of funds lead to different cost of funds, informational asymmetries, issues of control and dilution, conflicts of interest and financial risk, and thereby cause different impacts on the firm's performance and shareholder's wealth. This is witnessed in Philippines during the Asian Financial Crisis 1997 as the capital market was severely injured with the outflow of foreign investments and the weakening of the Peso. As a result, not only the distressed firms were adversely affected but the financial institutions were preoccupied with non-performing loans (NPL). Raising capital became more costly in Philippines because of risk premium, compounded by the higher level of interest rates needed to support the Peso. The high degree of dependence on banking institutions for financing has accelerated the deterioration of the financial market. The country soon realizes the importance of sustaining future growth and development through resourceful financing.

With some assistance from IMF together along with some corrective measures taken by the government like the Medium-Term Philippine Development Plan (MTPDP) for the period 2004-2010, the country eventually recovered from the Asian Financial Crisis 1997. However, the economy is still categorized in Stage 1 according to the Global Competitiveness Report 2009-2010. The financial sector is still dominated by banking sector, led by five large commercial banks. Two large state owned banks account for about 15 percent of total assets. The Philippines has one of the lowest degrees of financial intermediation in Asia, with a loan to GDP ratio under 65 percent. As the credit culture is weak, the inadequacies of credit in addressing the long-term developmental needs of the economy have persisted.

Table 1: An overview of the strength of financial market in Philippines

	Ease of access to loans	Ease of financing through local equity market	Soundness of banks	Regulation of securities exchanges	Restriction on capital flows	Financial market sophistication
Philippines	2.7	4.1	5.4	4.2	4.5	4.2
Global mean	3.1	3.7	5.2	4.3	4.5	4.3

Notes: Ease of access to loans indicates how easy it is to obtain a bank loan. Ease of financing through local equity market indicates how easy to raise money by issuing shares on the stock market. Both measures range from 1 (very difficult) to 7 (very easy). Soundness of bank measures the strength of banking sector in the country with scores from 1 (insolvent and may require a government bailout) to 7 (generally healthy with sound balance sheets). Regulation of securities exchanges measures the effectiveness of the regulation of securities exchanges, ranges from 1 to 7 where higher values indicate greater effectiveness. Restriction on capital flows measures how restrictive are regulations in the country relating to international capital flows, ranges from 1 (highly restrictive) to 7 (not restrictive at all). Financial market sophistication indicates the level of sophistication of financial markets in accordance with the international standards, ranges from 1 to 7 where higher values indicate excellencies by international standards. (source: World Economic Forum, Executive Opinion Survey 2008, 2009)

Table 1 shows the scores of the strength of financial market for Philippines. The financial market in the country is still not categorized as developed, be it being measured in the form of regulatory framework or using different indicators of market deepening. Generally, the scores are not much higher than the global average, even certain criteria are reported to be lower than the global

average. Table 2 shows the score of legal strength for Philippines. The low legal protection may hinder the borrowers from granting loans. This complies with the finding in Table 1 which reveals a lower score in the ease of access to loans. Being operating in a relatively less efficient and incomplete market than the developed country, firms in The Philippines may not be able to rationalize their financing decisions to follow a clear theoretical approach.

Table 2: Legal system and legal strength in Philippines

	Legal Origin	Investors' protection	Borrowers' and Lenders' protection	Corruption Index	Property Rights	Auditing and Reporting Standard	Strength of Legal Rights Index
Philippines	Civil French	4.0	3	7.22	3.8	4.9	3

Notes: Legal system and the corruption index are from La Porta et al. (1998). Corruption index ranges from 0 to 10, where higher values indicate more severe corruption. The strength of investor protection and the borrowers' and lenders' protection are from The World Bank, Doing Business 2009, ranges from 0 to 10 where higher values indicate greater protection. Property rights index and the strength of Auditing and Reporting standard are from the World Economic Forum, Executive Opinion Survey 2008 and 2009, ranges from 1 to 7, where higher values indicate stronger rights and higher standard respectively. Strength of legal rights index is from world bank database. It measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 10, with higher scores indicating that these laws are better designed to expand access to credit.

While majority of studies in the literature focus on investigating the determinants of capital structure in developed country, very limited studies have been carried out in the context of developing country. The dynamic environment couples with the corrective measure taken by the government since the Asian Financial Crisis 1997 create a unique opportunity to shed light on the roles of environmental factors on capital structure decision. Hence, this study develops a capital structure model based on a sample of Philippines firms from year 2000-2010 that links firm-macroeconomic-institutional characteristics. The broader motivation behind this objective is to address whether the corporate financing decisions made by firms in developing country are affected by firm-macroeconomic-institutional factors.

To the authors' knowledge, no previous research studies the roles of organizational-environmental fit as capital structure determinants in Philippines. Hence, this study contributes to the literature as it strives to identify what affect the firms' capital structure decision in Philippines which may not necessarily follow a clear theoretical approach. It may well be that firms in Philippines are creating completely new capital structure formulation to suit their own distinct environment. Second, an interesting discussion in the capital structure studies relates to what extend the organizational factors and environmental factors can describe the financing choices of corporations. The results presented here contribute to this literature by showing how the firms interact with the environment in which they operate when deciding the capital structure decision. Third, understanding what lies behind the findings is essential for furthering our insight into the adaptation strategy. This has important implications to policy makers for the design and implementation of the financial reforms in order to address the future crisis. We attempt to provide new evidence to the possible organizational-environmental fit in capital structure decision, an important element that has been largely ignored in existing empirical tests. Fourth, prior researches tend to limit their analysis to certain estimation models which may lead to significant results bias. In order to avoid such bias, we conduct a comprehensive analysis using different estimation models. The variation of the method allows a better understanding of the robustness of the capital structure determinants. Finally, we hope that the disclosure of organizational-environmental fit in capital structure decision will assist in the development of new sophisticated theories in the future.

The rest of this paper is organized as follows. In Section II, we begin our review of capital structure determinants from the past literature. The empirical model is presented in Section III. The data and variables are described in Section IV. Finally, the findings and conclusion are included in Section V and VI.

2. LITERATURE REVIEW

There is a vast research that studies the roles of environmental factors on the capital structure decision. This includes the macroeconomics conditions and the institutional settings. Institution refers to a series of political, social, and legal rules embedded in a country. In countries with a better contracting environment, the protection to creditors, bondholders and shareholders are stronger. These enhance loans availability and lower the cost of funds and hence play an essential role in the determinants of capital structure across countries. Past empirical works evidenced that firms in countries with better protected creditor rights adopt higher leverage (Cheng and Shiu, 2007; Delcoure, 2007; González & González, 2008).

Korajczyk and Levy (2003) formulate capital structure as a function of the firm-specific characteristics and macroeconomic states. This is supported by Hackbarth et al. (2006) and Levy and Hennessy (2007). Recent findings by De Jong et al. (2008) also in support that both institutional setting and the macroeconomic states are significant factor in explaining the capital structure decision. Besides the economy in general, the developments in the financial market has attracted researchers' attention as when financial market develops, it becomes less expensive for firms to raise relevant funds. Agarwal and Mohtadi (2004) show that the development of the stock market encourages firms to use more equity capital, while banking sector and bond market development favors debt financing. This is further supported by González & González (2008) who find a significant impact of the degree of development in the banking sector on capital structure. Mitton (2006) add to the literature by showing that the openness of economy to the foreigners induces the inflow of external funds. It expands the financing resources and reduces the cost of debt and equity capital. This is further confirmed by Lucey and Zhang (2011) who demonstrate that higher credit market integration fosters higher leverage while greater equity market integration results in lower leverage. To conclude, more evidences are presented to indicate that the macroeconomic environment and institutional context are as important as firm characteristics in determining the firm's capital structure.

3. EMPIRICAL MODEL

The capital structure is modeled as a function of the organizational level and environmental level variables as in equation (1).

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

In which $D^*_{i,t}$ is the capital structure for the i th firm at time t and $X_{k,i,t-1}$ refers to the k -th set of explanatory variables of firm i th at time $t-1$, $Y_{k,t-1}$ refers to the k -th set of environmental variables including the macroeconomic conditions and institutional context at time $t-1$, v_i are companies' non-observable individual effects and $\varepsilon_{i,t}$ correspond to the error. It is important to highlight here that there are three distinct features in this model. Firstly, we include macroeconomic condition and institutional context that are scaled with time variant data to reflect the respective time frame. Secondly, we consider traditional capital structure theories as complements by integrating the firm-level factors that have been proposed into a unified framework. Thirdly, all time-variant variables used are lagged by 1 year. This is to allow for the non-contemporaneous effects on capital structure decision where the determinants are well-known by the finance managers at the time of decision. In addition, the use of lagged variables also mitigates endogeneity concerns (Lucey and Zhang, 2011).

As for the estimator, we start from the Pooled OLS model and Random Effects model. The Breusch & Pagan LM test is carried out to determine which method in between OLS and RE is more appropriate. It is to note that Pooled OLS and RE have been proven to be bias because of the possible correlation between unobserved firm-specific effects and other explanatory variables and the possibility that the explanatory variables are not exogenous. However, the results are reported too in this study for reference and comparative purposes. In order to capture the firm specific effects, the Fixed Effects (FE) model is employed. This is vital as each firm has its' own unique features to counteract with the environment. Hausman test is then carried out to decide whether RE or FE is more appropriate.

It should be highlighted here that the above mentioned models do not take into account the problems of serial correlation, heteroskedasticity and endogeneity of some explanatory variables. Prior researches tend to ignore these issues and to our knowledge, this is the one of the first study on capital structure that considers and rectifies these problems in order to report unbiased results. Hence, we carry out post estimation diagnostic test on multicollinearity by using variance inflation factor (VIF), heteroskedasticity by modified Wald Statistic and serial correlation by Wooldridge test in our panel data. If it indicates that there are heteroskedasticity and serial correlation problems, we rectify such problems by employing two alternative models: (1)Fixed Effects (FE) with robust standard errors and (2)OLS with heteroskedasticity and serial correlation robust standard errors.

4. DATA AND SAMPLE

This study collects the data of the listed firms in Philippines from the Datastream database. These secondary data are official and are the results of published data from all companies listed on the stock market from the period 2000-2010. This period is chosen in order to highlight how the organizational level and environmental level variables contribute to the capital structure decision in Philippines in the aftermath of Asian Financial Crisis 1997. The choice of year 2000 as the beginning of the sample period is to allow the study to control for and avoid a number of other intervening and complicating factors which occurred after the Asian Financial Crisis 1997.

In order to maximize the use of all available data, we adopt unbalanced panel data regression method in this study. The sample selection is based on the availability of the data supplied by the database. At first, the financial companies, namely banks, insurance companies and investment societies, are excluded. This is because their capital structure is chosen in accordance with specific regulations for financial institutions and therefore exhibits different elements from non-financial companies. At the second stage, this study removes outliers within 1% and 99% percentiles. Thus, the

final sample consists of 1,430 firm-year observations which come from 169 listed companies in Philippines. The macroeconomic and institutional data are collected from reliable sources like World Bank Database, The Wall Street Journal and the Heritage Foundation, World Economic Forum and the official website of Association of South East Asian Nations.

The dependent variable in this study is the firms' debt ratio. According to Graham and Harvey (2001), measurement of debt ratio using book value is reasonable because financial managers use mainly book value of leverage in decision making. In the event of bankruptcy, the main cost of borrowing is the expected cost of financial distress, in which the debt holders' liability is measured using the book value of debt rather than the market value. Hence, we employ book leverage in measuring the capital structure, which is defined as the ratio of book value of total debt to book value of total assets.

The independent variables include 12 organizational factors and 10 environmental factors as in Table 3. The data of the organizational factors are calculated from the Datastream database while the data of the environmental factors are sourced from the World Bank database and The Wall Street Journal and The Heritage Foundation.

Table 3: The proxy for independent variables

	Independent Variable	Proxy
1.	Tangibility	The ratio of fixed assets to total assets is used as a proxy for tangibility
2.	Profitability	The ratio of earnings before interest and taxes to total assets.
3.	Size	The natural logarithm of total assets
4.	Non debt tax shields	The ratio of annual depreciation expense to total assets is used as a proxy for non debt tax shields.
5.	Growth	The ratio of market value to the book value of equity.
6.	Free cash flow	Earnings before taxes + Interest + Depreciation
7.	Liquidity	The ratio of current assets to current liabilities
8.	Dividend	The payout ratio
9.	Uniqueness	The cost of sales to net sales
10.	Interest Coverage Ratio	The ratio of earnings before interest and tax to interest payment
11.	Distance from Bankruptcy	Altman Z score= $3.3(\text{earnings before interest and taxes}/\text{total assets}) + 1.0(\text{sales}/\text{total assets}) + 1.4(\text{retained earnings}/\text{total assets}) + 1.2(\text{working capital}/\text{total assets})$.

12.	Market Price Performance	The annual change in the share price.
13.	GDP Growth	Yearly changes in GDP*
14.	Lending Rate	The lending rate charged by banks on loans*
15.	Consumer Price Index	The Consumer Price Index*
16.	Stock Market Development	The percentage of total stock market capitalization over GDP*
17.	Bond Market Development	The percentage of total bond market capitalization over GDP*
18.	Size of Banking Sector	The ratio of bank assets to GDP*
19.	Foreign Direct Investment	The net inflows of investment*
20.	Money Supply	Money and quasi money (M2) as % of GDP*
21.	Country Governance	World Bank Governance Indicator *
22.	Economic Freedom	Index of Economic Freedom**
Note: * indicates the data are sourced from the World Bank database; ** indicates the data are sourced from The Wall Street Journal and The Heritage Foundation		

5. RESULTS

On average, the debt ratio of listed firms in The Philippines is 23.82% within the period of 2000-2010. Table 4 presents the regression results. The Breusch & Pagan LM test and Hausman test show that Fixed Effects (FE) model is more appropriate than Pooled OLS and Random Effects. Nevertheless, modified Wald Statistic and Wooldridge test reveal that there are heteroskedasticity and serial correlation problems. Hence, we employ two models, namely Fixed Effects (FE) with robust standard errors model and OLS with heteroskedasticity and serial correlation robust standard errors model to capture these problems in order to report unbiased results.

There are six organizational factors and two environmental factors which are reported to be significant determinants of capital structure in Philippines. Tangibility is reported negatively significant to debt ratio. The reason is that high tangible firms display lower information asymmetry problem and thus have higher preference for equity which is less costly. Sizeable firms are reported to record higher debt ratio. This result can be explained on the basis that bigger firms are well diversified and have the lower risk of bankruptcy costs. Besides, they have greater access to the credit market which enhances their debt capacity. Profitability is negatively and significantly related to debt ratio in Philippines. These firms retain a relatively larger proportion of earnings as internal funds. This could be due to the relatively weaker protection of investors and creditors in Philippines which cause

difficulties for firms to raise external capital and thus, are forced to rely on internal funds. This is further supported as the results show that liquidity exerts a negative influence on firm's debt ratio, indicating that firms in Philippines prefer to use internally generated funds as financing source. Another reason could be firms in Philippines try to avoid the disciplinary role of external force in favor of shareholders against the interest of debt holders. It is also found that firms in Philippines drive away from debts obligation when the bankruptcy risk increases, showing that the firms have learnt from the pitfalls of excessive debts during the Asian Financial Crisis 1997. This leads to a negative impact of bankruptcy risk on debt ratio. Non debt tax shield has recorded a positive impact which is inconsistent with the findings in the literature. It shows that firms in Philippines that employ higher debt financing have invested heavily in tangible assets. Hence, a higher depreciation and tax credits are recorded when higher debts are employed.

As for the environmental factor, the World Bank Governance Indicator is positively correlated to debt ratio. This further confirms that as the country improves its legal and governance settings, the confidence of the creditors is enhanced, and hence more loans will be granted. Literature suggests that higher foreign direct investment should cause lower debt ratio. However, the foreign direct investment in Philippines has shown a contrast effect by causing a positive impact on debt ratio. The possible explanation is that when the foreign direct investment increases, it reveals the foreign investors' confidence about the future prospect of the firms. This also leads to higher confidence level in the credit market that enables the firms to source for more external debts. Hence, it is interesting to highlight here that the market confidence could have played a vital role in determining the capital structure in Philippines. Hence, future study should take into account the market confidence level as determinant of capital structure.

Table 4: The regression results

	Pooled OLS	Random Effect (RE)	Fixed Effect (FE)	FE with robust SE	OLS with robust SE
Constant	0.6248 (0.438)	0.2798 (0.494)	-0.1334 (0.773)	-0.1334 (0.749)	0.6248 (0.218)
Tangibility	-0.1397 (0.000)***	-0.1432 (0.000)***	-0.1092 (0.014)**	-0.1092 (0.049)**	-0.1397 (0.059)*
Profitability	-1.0124 (0.000)***	-0.3859 (0.035)**	-0.2239 (0.241)	-0.2239 (0.536)	-1.0124 (0.022)**
Size	0.0688	0.1051	0.1839	0.1839	0.0688

	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.001)***
Non Debt Tax Shield	1.2279 (0.000)***	0.6000 (0.001)***	0.4501 (0.019)**	0.4501 (0.240)	1.2279 (0.015)**
Growth	-0.0008 (0.683)	-0.0008 (0.489)	-0.0017 (0.112)	-0.0017 (0.158)	-0.0008 (0.568)
Free cash flow	0.0000 (0.961)	-0.0000 (0.180)	-0.0000 (0.172)	-0.0000 (0.226)	0.0000 (0.971)
Liquidity	-0.0001 (0.083)*	-0.0000 (0.720)	-0.0000 (0.274)	-0.0001 (0.004)***	-0.0001 (0.072)*
Dividend	-0.0011 (0.662)	-0.0010 (0.456)	-0.0010 (0.457)	-0.0010 (0.500)	-0.0011 (0.608)
Uniqueness	0.0027 (0.064)*	0.0028 (0.012)**	0.0018 (0.110)	0.0018 (0.069)*	0.0027 (0.442)
Interest Coverage Ratio	0.0000 (0.420)	0.0000 (0.254)	0.0000 (0.325)	0.0000 (0.088)*	0.0000 (0.329)
Distance from Bankruptcy	-0.0742 (0.000)***	-0.0892 (0.000)***	-0.0823 (0.000)***	-0.0823 (0.000)***	-0.0742 (0.052)*
Market Price Performance	-0.0023 (0.405)	-0.0005 (0.763)	-0.0005 (0.770)	-0.0005 (0.464)	-0.0023 (0.102)
GDP Growth	0.0096 (0.510)	0.0020 (0.878)	0.0007 (0.925)	0.0007 (0.886)	0.0096 (0.185)
Lending Rate	-0.0223 (0.260)	-0.0157 (0.559)	-0.0169 (0.109)	-0.0169 (0.070)*	-0.0223 (0.072)*
Consumer Price Index	-0.0019 (0.443)	-0.0013 (0.389)	-0.0018 (0.185)	-0.0018 (0.080)*	-0.0019 (0.158)
Stock Market Development	-0.0009 (0.523)	-0.0001 (0.913)	0.0000 (0.948)	0.0000 (0.923)	-0.0009 (0.158)
Bond Market Development	-0.0038 (0.348)	-0.0015 (0.466)	-0.0011 (0.615)	-0.0011 (0.528)	-0.0038 (0.197)
Size of Banking Sector	0.0063 (0.409)	0.0004 (0.948)	-0.0006 (0.887)	-0.0006 (0.833)	0.0063 (0.123)
Foreign Direct	0.0096	0.0012	0.0131	0.0131	0.0096

Investment	(0.205)	(0.008)***	(0.005)***	(0.011)**	(0.089)*
Money Supply	0.0047 (0.710)	-0.0051 (0.113)	-0.0074 (0.275)	-0.0074 (0.114)	0.0047 (0.448)
World Bank Governance Indicators	0.6537 (0.001)***	0.9376 (0.000)***	0.9880 (0.000)***	0.9880 (0.000)***	0.6537 (0.013)***
Index of Economic Freedom	-0.0131 (0.477)	0.0086 (0.307)	0.0012 (0.902)	0.0012 (0.860)	-0.0131 (0.145)
Breush-Pagan LM test	568.59 (0.000)***		-	-	-
Hausman test	-	5.49 (0.9927)		-	-
Observation	1430	1430	1430	1430	1430
Multicollinearity (vif)	-	-	4.01	-	-
Heteroskedasticity (X^2 -stat)	-	-	0.0000 (0.000)***	-	-
Serial Correlation (F-stat)	-	-	228.077 (0.000)***	-	-
Notes: Dependent variable is debt ratio. ***, ** and * indicate significant at 1, 5 and 10 per cent respectively. The t-statistics are in parentheses.					

6. CONCLUSION

This study documents six significant organizational variables and two significant environmental variables as determinants of capital structure in Philippines. This suggests that firm does not only consider its own conditions when deciding capital structure but also the environmental factors in which they operate. The model developed in this study can be further reinforced if it could take into account the behavioral factors such as the issues of political patronage, social cultures, personality trait of finance managers and market sentiments.

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