

The Effects of Macroeconomic Conditions on Corporate Capital Structure: Evidence from Manufacturing Firms Listed in Colombo Stock Exchange

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Abstract: With the rapid development of the modern market economies, to safeguard the comprehensive competitiveness, companies adjust their capital structure based on the external and internal environments. Thus, in the selection of companies' financing policies, especially the debt decisions, the macroeconomic conditions will be very critical. Hence, the purpose of this study is to examine the effects of macroeconomic conditions on capital structure decisions of manufacturing firms listed in Colombo Stock Exchange. A panel data covering a period of 10 years from 2004 to 2013 for 27 listed manufacturing firms in Colombo Stock Exchange used while fixed and random effects models were used to analyze the data. The empirical results demonstrate that in overall macroeconomic conditions have significant effects in determining the capital structure decisions of the manufacturing firms listed in Sri Lanka. The banking sector development is found to be significant in determining the capital structure decisions of Sri Lankan manufacturing firms while results further depict that the development of the stock market is insignificant in the capital structure choice of the Sri Lankan manufacturing companies. Moreover, GDP growth rate and inflation are found to be insignificant in determining the capital structure choice of the Sri Lankan manufacturing firms.

Keywords: Macroeconomic conditions; Capital structure; Manufacturing firms; Sri Lanka

1. Introduction

The capital structure decision has become crucial for any business organization in order to measure the firm's ability to deal with its competitive environment while maximizing the returns to various stakeholder groups of the organization (Abor & Biekpe, 2005). However, it is a difficult task to maintain a balanced portfolio of debt and equity to maximize the firm value while taking the costs and benefits into consideration (Sheikh & Wang, 2011). On the other hand capital structure is also considered as one of the mechanisms to mitigate the agency cost as managers tend to manage the firms more attentively not to confront financial distress where it decreases the possibility of experiencing the agency cost and thereby increase firm performance (Berger & Bonaccorsi di, 2006).

The theories on capital structure have given more consideration especially to firm level characteristics. Based on these capital structure theories numerous empirical studies had been performed and confirmed that tax shield, assets structure, profitability, firm size, growth, risk, liquidity, industry class and product uniqueness are the firm specific key attributes which having clear relationships with capital structure and they directly impact toward determining the capital structure of the firms (Titman & Wessels, 1988; Samarakoon, 1999).

Even though the previous studies concentrated more on the firm level characteristics, the role of the macroeconomic factors in determining the capital structure of the firms are also becoming important as they are essential for the effective and sound decisions of the firms (Riaz et al., 2014). Hence, the influence of macroeconomic factors on capital

structure of the firms is one of the confounding issues currently confronted by the financial managers as they make decisions in the monetary and real market frameworks within which firms operate where the macroeconomic conditions are expected to exert a significant influence on all of the financial and investment decisions (Muthana et al., 2013).

Moreover, it is one of the newly emerging interests that constitutes finding on how macroeconomic factors affect on capital structure decisions of the business organizations as most of the studies on capital structure decisions of manufacturing firms in the Sri Lankan context focused on firm specific factors on capital structure (Prahalthan 2010; Jude Leon 2013; Nirajini&Priya 2013). Thus, the aim of this study is to find out how macroeconomic factors influence on capital structure decisions of Sri Lankan manufacturing firms. The rest of the paper is organized as follows. Section 2 considers literature on the impact of macroeconomic factors on capital structure. Section 3 discusses methodology used in the study and also details the model specification used for the empirical analysis. Section 4 includes the discussion of the empirical results. Finally, Section 5 summarizes and concludes the paper.

2. Literature Review

2.1 Theories of Capital Structure

The path breaking seminal work of Modigliani and Miller (M&M) (1958), on capital structure of the firms gave origins to a rich literature where their findings with respect to the capital structure with formal evidence which was later become popular as M&M irrelevance proposition on capital structure. M&M irrelevant proposition indicates that, when

the firms are operating under perfect market conditions where the corporate taxes and bankruptcy costs are absent, the firm's value solely depends on the level and risk of its future cash flows. The trade-off theory explains that the capital structure of the firms determined by a trade-off between benefit of tax advantage of debt and potential bankruptcy cost of debt where two major theories, tax/bankruptcy and agency theory, can be identified in the trade-off theory (Lemma & Negash, 2012). Firms set a target capital structure to maximize the value of the firms while considering the benefits and costs of debt (Graham & Harvey, 2001), while on the other hand, the financial managers trying to balance agency cost of debt against benefits of debt when making decisions regarding capital structure choice of the firms (Jenson, 1986).

The information asymmetries prevail in the market also affect on the capital structure decisions of the firms (Lemma & Negash, 2012). As per the pecking order theory initiated by Myers and Majluf (1984), a firm does not follow a target capital structure where firm choices over the levels of debt to be absorbed into the capital structure based on financing needs. As per Baker and Wurgler (2002), the market timing theory demonstrates that firms tend to look at the market conditions when raising debt while firms raise funds from markets when they look more favorable. Huang and Ritter (2005), documented that small growth firms rely heavily on debt financing and only resort to equity markets when the cost of equity capital is low which is consistent with the market timing theory.

2.2 Measurement of capital structure

Rajan and Zingales (1995), documented that, the definition of capital structure depends on the objective and purpose of the study. Thus, different empirical results have been produced based on the capital structure measurement that has been used in the study. Most of the studies do not use market-based values of capital structure due to several reasons such as data limitation where market value data of debt is not often available (Titman & Wessels, 1988). Titman and Wessels (1988), further illustrated that some managers tend to target capital structures based on book-based measures since market values of equity depends on several factors that often can not be controlled by firms. Furthermore, Fama and French (2002), noted that most of the theoretical predictions applicable to the book-based measures of capital structure. Bowman (1980), demonstrated that use of the book-based values delivers similar results to that of the market-based values of capital structure as they are highly correlated. Therefore he concluded the misspecification due to using book-based value measures is probably fairly small.

2.3 Macroeconomic conditions and capital structure

The literature highlights the importance of macroeconomic factors in determining the capital structure decisions of a firm (Booth et al., 2001; Gajurel, 2006; Bopkin, 2009; Lemma & Negash, 2012). The stock market is available for firms to raise funds which allows businesses to be publically traded or raised additional capital for expansion by selling ownership of shares of a company in a public market (Aduda et al., 2012). Demircuc-Kunt and Maksimovic (1996),

reported a negative relationship between an active stock market and the use of long-term debt, and on the other hand, concluded that in already developed stock markets, further development leads to substitution of equity for debt financing. Further, Booth et al. (2001), also documented a negative relationship where they further profound that once the capital markets become more developed, they become a viable option for corporate financing and firms make less use of debt financing. Lemma and Negash (2012), reported a positive relationship where the authors concluded that the results support the view that developed stock markets reduce the information asymmetry issues confronted by creditors so that enhance borrowing opportunities of a publically quoted company.

Diamond (1984), argued that banks and other financial intermediaries have important advantage over equity markets in reducing information asymmetries that produce adverse selection problem while also playing a vital role in plummeting the costs of acquiring and processing information about potential investment activities and in exercising control over the management of existing firms. This will consequently motivate firms to access funds from banks at a lower rate so that a positive relationship between size of the banking sector and the firms' capital structure choice has been reported by Bopkin (2009). However, Lemma and Negash, (2012), found a negative relationship as stronger creditor rights protection and better quality of law enforcement may have discouraged firms from borrowing money since the firms may want to reduce the risks that involved with debt.

Moreover, Harkbarth et al. (2006), documented that macroeconomic conditions determine both the pace and the size of capital so that due consideration should also be given to the state of the economy as well. Dammon and Senbet (1988), noted that high inflation forces investors to sell bonds in exchange for stocks and hence firms' capital structure measured as debt-equity ratio, tends to drop. However, Booth et al. (2001), found that higher inflation leads to a decrease in both total and long term debt ratios in developing countries. The rate of growth in the gross domestic product (GDP) of the country is essential for effective and sound decision making of firm's financial policies (Riaz et al., 2014). Booth et al. (2001), reported a positive relationship where they found that real economic growth tends to increase total debt ratio and long-term book-debt ratio where the firms can borrow against real, but not inflationary growth prospects. However, the stock prices are likely to increase during the periods of economic growth and it leads firms to use lesser amount of debt in their capital structures (Bopkin, 2009; Lemma & Negash, 2012).

3. Methodology

This study expects to examine the influence of macroeconomic conditions on the capital structure decisions of Sri Lankan manufacturing firms. Thus, the panel data regression analysis had been applied since the study hopes to examine the time variance effects across firms.

In general, the study targets all 40 listed manufacturing companies in the Colombo Stock Exchange (CSE).

However, the sample of this study cleaned by excluding the firms that do not have complete records during the period under consideration. Therefore, this study retained 27 companies listed in the manufacturing (MFG) sector, over a period of 10 years from 2004 to 2013. The information regarding the capital structure of the firms is obtained through the Annual Reports of the companies while macroeconomic information obtained through the Annual Reports of the Central Bank of Sri Lanka. Hence, a pure quantitative set of secondary data used in this study where all the data have been analyzed by using E-views software package with suitable statistical and econometric tools. The equations (1) – (6) define capital structure as a function of macroeconomic factors where the study used two estimation models, fixed effects model and random effects model and execute Hausman specification test (Hausman, 1978) to determine which estimation model best explains the estimation of the study.

$$\begin{aligned}
 TLA_{it} &= \beta_{0i} + \beta_1 SIZE_t + \beta_2 CR_t + \beta_3 GDP_t + \beta_4 INF_t + \mu_{it} \quad (1) \\
 CLA_{it} &= \beta_{0i} + \beta_1 SIZE_t + \beta_2 CR_t + \beta_3 GDP_t + \beta_4 INF_t + \mu_{it} \quad (2) \\
 NCLA_{it} &= \beta_{0i} + \beta_1 SIZE_t + \beta_2 CR_t + \beta_3 GDP_t + \beta_4 INF_t + \mu_{it} \quad (3) \\
 TLA_{it} &= \beta_0 + \beta_1 SIZE_t + \beta_2 CR_t + \beta_3 GDP_t + \beta_4 INF_t + \varepsilon_{it} + \mu_{it} \quad (4) \\
 CLA_{it} &= \beta_0 + \beta_1 SIZE_t + \beta_2 CR_t + \beta_3 GDP_t + \beta_4 INF_t + \varepsilon_{it} + \mu_{it} \quad (5) \\
 NCLA_{it} &= \beta_0 + \beta_1 SIZE_t + \beta_2 CR_t + \beta_3 GDP_t + \beta_4 INF_t + \varepsilon_{it} + \mu_{it} \quad (6)
 \end{aligned}$$

TLA_{it} = total debt ratio of firm i at time t , CLA_{it} = short term debt ratio of firm i at time t , $NCLA_{it}$ = long term debt ratio of firm i at time t , $SIZE$ = stock market size, CR = banking sector development, GDP = GDP growth rate, INF = inflation, β_0 = common intercept, $\beta_1 - \beta_4$ = coefficient of independent variables, β_{0i} = intercept of firm i , μ_{it} = error term of firm i at time t , ε_{it} = cross section error term

The summary of the variables and their proxies that have been used in the present study to empirically investigate the influence of macroeconomic factors on corporate capital structure is demonstrated in the Table 1.

Table 1: Summary of variables

Variables	Proxy Measures
Capital Structure	Total debt ratio = Total liabilities/Total assets
	Long-term debt ratio = Total non-current liabilities/ Total assets
	Short-term debt ratio = Total current liabilities/ Total assets
Macroeconomic Factors	
Stock Market Development	Stock market size = Market capitalization/ GDP
Banking Sector Development	Bank credit/GDP
GDP Growth	Annual GDP growth rate (Real terms)
Inflation	Annual change in Colombo Consumer Price Index (CCPI)

4. Data Analysis and Discussion

4.1 Descriptive Statistics

Table 2: Descriptive statistics

	Mean	Maximum	Minimum	Std. Dev.
TLA	0.508663	2.741128	0.014563	0.309896
CLA	0.389154	1.627866	0.013251	0.252425
NCLA	0.119509	1.113262	0.001312	0.129378
SIZE	0.257700	0.394000	0.111000	0.075479
CR	0.521969	0.780032	0.289274	0.157285
GDP	0.065500	0.082000	0.035000	0.013383
INF	0.099300	0.226000	0.035000	0.052757

The Table 2 demonstrates that 50.86% of the total assets of the sample companies in the manufacturing sector are financed through debt financing sources where rest was financed through the equity sources. However, this evidence contradicts with the findings of Senarathne (1998), who reported that Sri Lankan firms tend to use higher level of equity in their capital structures. Further, the results in the Table II demonstrate that manufacturing firms tend to use higher level of short term debt sources compared to long term debt sources. This clearly in lines with the findings of Samarakoon (1999) who reported that Sri Lankan firms tend to use lower level of long term debt in their capital structure. Moreover, this further confirms the findings of Demircug-Kunt and Maksimovic (1999), suggesting that firms in developing countries have substantially lower amounts of long term debt. The mean value of the stock market size registers 25.77% while banking sector development depicts a mean value of 52.19% indicating that banking sector development is relatively higher than the development of the stock market in the Sri Lankan context. GDP growth rate demonstrates a mean value of 6.55% while inflation registers a mean value of 9.93% during the sample period.

4.2 Correlation Analysis

Table 3 demonstrates that the short term debt ratio is having a higher correlation with the total debt ratio (0.91) compared to the long term debt ratio (0.61). This may be as depicted in Table 2, manufacturing firms in Sri Lanka tend to use higher amount of short term debt in their capital structures compared to long term debt. The size of the stock market demonstrates an insignificant negative correlation with all capital structure measures except the long term debt ratio where it demonstrates a positive association. On the other hand banking sector development depicts a negative significant correlation with all capital structure measures while it demonstrates a positive significant correlation with the development of the stock market. The GDP growth rate depicts an insignificant negative correlation with all capital structure measures except with the long term debt ratio where it demonstrates a positive association. Further, GDP growth rate depicts a significant positive relationship with the stock market size and the banking sector development. Table III further depicts that the inflation has an insignificant positive correlation with total and short term debt ratios while a negative correlation with the long term debt ratios. Moreover, the inflation depicts a significant negative correlation with the development of the stock market and

debt market while it depicts a positive insignificant correlation with the GDP growth rate.

Note: * and **, Significant at 1 percent, and 5 percent level respectively

Table 3: Correlation matrix

	TLA	CLA	NCLA	SIZE	CR	GDP	INF
TLA	1						

CLA	0.914	1					
	0.000	-----					
NCLA	0.612	0.239	1				
	0.000	0.0001	-----				
SIZE	-0.085	-0.111	0.014	1			
	0.1634	0.0675	0.8236	-----			
CR	-0.204	-0.198	-0.103	0.4814	1		
	0.0007	0.0011	0.092	0.000	-----		
GDP	-0.065	-0.082	0.005	0.635	0.3957	1	
	0.2888	0.1789	0.9361	0.000	0.000	-----	
INF	0.070	0.087	-0.004	-0.680	-0.282	0.032	1
	0.2547	0.1516	0.9465	0.000	0.000	0.6048	-----

4.3 Regression Results

The results of Hausman specification test revealed that random model is superior to that of the fixed model. However, Ben Khediri and Ben-Khediri, (2011), further indicated that if the model is correctly specified and individual effects are uncorrelated with the independent variables, the fixed effects and random effects estimators should not be statistically different. The banking sector development demonstrates a negative relationship with all capital structure measurements of manufacturing firms. This indicates that the imposition of stronger rights to protect the creditors and execution of high quality of law may have discouraged the firms from borrowing money since the firms may want to reduce the risks that involved with debt (Lemma &Negash, 2012), Furthermore, as Sharpe (1990) pointed out, companies may not want to borrow beyond a point from banks irrespective of the availability of funds due to the costs that are attached with excessive bank debt. Moreover, the results further depict that the development of the banking sector has a significant impact on the capital structure decisions of the Sri Lankan manufacturing firms where this may be due to the fact that higher portion of total loans and advances of Sri Lankan commercial banks (11% in years 2014, 2013, 2012) granted to the firms in the manufacturing sector.

Table 4: Regression results

TLA					
Variable	C	SIZE	CR	GDP	INF
Coefficient	0.642835	0.433916	-0.41668	-1.17739	0.489662
Prob.	0.0000*	0.4077	0.0000*	0.589	0.3975
R-squared	0.589589		F-statistic		11.44478
Adjusted R-squared	0.538073		Prob. (F-statistic)		0.0000
NCLA					
Variable	C	SIZE	CR	GDP	INF
Coefficient	0.132257	0.176081	-0.11783	-0.04306	0.062453
Prob.	0.0057*	0.509	0.0147**	0.969	0.832
R-squared	0.39017		F-statistic		5.097091
Adjusted R-squared	0.313623		Prob. (F-statistic)		0.0000
CLA					
Variable	C	SIZE	CR	GDP	INF
Coefficient	0.510578	0.257835	-0.29885	-1.13433	0.427209
Prob.	0.0000*	0.5362	0.0001*	0.513	0.3536
R-squared	0.608477		F-statistic		12.38125
Adjusted R-squared	0.559332		Prob. (F-statistic)		0.0000

On the other hand, the GDP growth rate demonstrates a statistically insignificant negative relationship with the capital all structure measures of the sample companies. This indicates that, likely increase in profits during the times of economic growth may tend to lead lower usage of debt by the firms (Booth et.al., 2001; Lemma &Negash, 2012). The Figure 1 further proves this argument where the return on assets of the manufacturing firms in line with the real economic growth of the country.

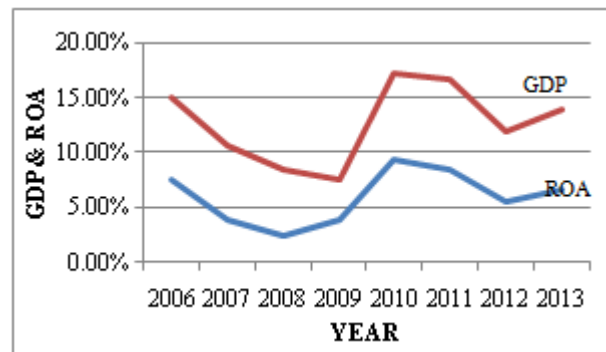


Figure 1: Movement of GDP and ROA

The empirical results in Table 4 demonstrate that inflation has a statistically insignificant positive relationship with capital structure measures of the manufacturing firms. This positive conjecture is in line with the findings of Frank and Goyal, (2009) who reported that a firm is likely to issue more debt under inflationary environment since inflationary situations not only decrease the real value of debt but also increase the real tax advantage of debt for firms.

5. Conclusion

This study explores the influence of macroeconomic conditions on corporate capital structure since Frank and Goyal (2009), have clinched that nearly 30 percent of alterations in capital structure could be described by internal determinants. Thus, this infers that there are other factors affecting capital structure decisions which are not taken into consideration by internal determinants. Hence, this empirical study attempted to examine the effects of macroeconomic conditions on corporate capital structure of 27 companies listed in manufacturing sector in the Colombo Stock Exchange. In terms of macroeconomic factors, the study documents that the development of the banking sector has a negative significant impact on the capital structure decisions of the sample companies while it is also depicted that the stock market development is insignificant in determining the capital structure decisions. The study also presents that the GDP growth rate has an insignificant and negative association with the capital structure which indicates that when the economy is at a growth phase, companies may tend to portray high profits so that it creates less demand for debt. Further, the inflation has demonstrated a positive but statistically insignificant association with the capital structure measures of the companies in the manufacturing sector.

Since capital structure is one of the most controversial issues in corporate finance there is a room for study from different perspectives. Therefore, the author further suggests that further research on the effects of macroeconomic conditions on the cost of capital should be executed in order to obtain a holistic view on how macroeconomic conditions affect firms' financing decisions and thereby the values of the firms. Moreover, as in most empirical studies on this subject, the study used the companies listed in a recognized stock exchange as units of analysis, since financial reports of listed firms tend to be more credible than those of non-listed firms and convenient access into data of listed firms to that of the non-listed firms. Therefore, a question arises whether the impact of macroeconomic conditions on capital structure decisions of non-listed firms do add more valuable literature to the corporate finance of Sri Lanka and other developing countries. Thus, it remains as an open research question which is another promising area for future research so that further research in this regard is inevitable.

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