

Determinants of Capital Structure; A Study of Listed Banks in Colombo Stock Exchange in Sri Lanka

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ABSTRACT

This study examines the determinants of capital structure of listed banks in the Colombo Stock Exchange in Sri Lanka. Nine listed banks were taken as samples from the Colombo Stock Exchange for the period of 2007 to 2019. The leverage as dependent variable and GDP growth rate, inflation, size of the banks, Return on Assets, tax, profitability and total debt to equity ratio as independent variables are used to find the relationship between dependent and independent variables. In order to investigate these relationships, panel data least square method was adapted with random effect mode. The findings show that debt to equity ratio tax paid of the listed banks is important as determinants of capital structure of banks in Sri Lanka. However, GDP growth, inflation, size of the banks, Return on Assets, and profitability are found to have no statistically significant impact on the capital structure of the listed banks in Sri Lanka. In addition, the results of the analysis indicate that Pecking Order Theory is pertinent theory in the Sri Lankan banking industry, whereas there is little evidence to support Static Trade-off Theory and the Agency Cost Theory. Therefore, the banks should consider factors appropriately to

determine their optimum capital structure in a prudent manner against potential shocks in terms of the regulation stipulated by regulator.

Keywords: leverage, Return on Assets, tax, profitability and total debt to equity ratio, panel data

1. Introduction

The banking sector is dominant in Sri Lanka in terms of financial institution assets. Hence, as a prudential requirement in Sri Lanka, minimum Capital Adequacy Ratio (CAR) which indicates the relationship of the bank's capital and assets, is required to be maintained by licensed banks. For that, in terms of the provision of Section 46 (1) and 76 j (1) of the Banking Act No.30 of 1988, the Monetary Board of the Central Bank of Sri Lanka (CBSL) issued the direction to Licensed Commercial Banks (LCBs) and Licensed Specialized Banks (LSBs)¹. LCBs and LSBs are two categories of banks based on the license issued by CBSL in Sri Lanka. The CBSL regulates the licensed banks under the regulatory and supervisory framework for the banks as the one of main functions of CBSL.

Further, the Basel III capital standards were introduced to the banking sector and Directions were issued accordingly by CBSL. The banks have to maintain minimum capital adequacy requirement with buffer in terms of the Basel III implementation from 2017 in order to absorb adverse shocks. Currently, the banks in Sri Lanka have maintained capital ratios at a comfortable level under Basel III.

Capital structure of a bank is comprised of long - term debt, short - term debt, common equity, and preferred equity. Since, finding an appropriate capital structure is a matter of concern in the area of corporate finance. The appropriate mix of capital structure leads to increase profitability and/or decrease the risk of a particular bank. Thus, it can also increase the bank's value. The bank can choose a mix of several methods to build capital structure such as issuing shares, borrowing funds and use of retained earnings for financing its capital. In a company, the ratio of mix of funds is dependent on the

¹ Directions issued by Central Bank of Sri Lanka to LCBs and LSBs

particular company and it is known as optimal capital structure. The capital structure decision enables the companies to allocate risk and control power among different groups of stakeholders. In literature, there are different capital structure theories. These theories explain their point of view about optimal capital structure, how an optimal capital structure can increase the value of the company and its impact on the cost of capital of the company. In some research studies, it is stated that liabilities are the most important factors determining the capital levels of the firms.

Determinants of capital structure under various categories have been identified by many research studies in history. As Alfon *et al.* (2004) revealed, it has been identified that the possible determinants come under three categories such as the bank's internal considerations, market discipline and the regulatory framework to determine the bank's capital structure. There are three parties involved in determining a bank's capital structure, namely, the bank, the market and the regulator.

The banks' internal considerations include the risk level of the banks, the impact of economic cycles, and the opportunity cost of the capital. The level of the capital is influenced not only by regulatory requirement but also some other factors such as the bank capital holding decisions. Capital is served as a buffer to absorb unexpected losses, reducing the probability of insolvency and, therefore the expected bankruptcy cost. Normally the regulatory capital is inadequate for insuring against risk and causes the necessity to hold a capital buffer.

In Sri Lanka, 30 Licensed Banks, including 24 LCBs and 6 LSBs are regulated by CBSL under the provision of Banking Act No. 30 of 1988². Out of these banks, 12 banks are listed in the Colombo Stock Exchange (CSE)³, which comprised 10 LCBs and 2 LSBs, under the listing rules issued by the Securities and Exchange Commission (SEC) in terms of the Securities and Exchange Commission Act.

² Central Bank of Sri Lanka Web Site

³ Colombo Stock Exchange Web Site

It has been observed that most of the Sri Lankan LCBs and LSBs maintain CAR well above the regulatory requirement. This is explained by the fact that the banks in Sri Lanka tend to operate in a prudential manner against potential shocks. Hence it is important to investigate what factors determine the actual level of capital by banks.

Even though, few numbers of empirical studies have been conducted in developing countries on factors determine the capital structure of the financial institutions, on the topic of determinants of capital structure of listed banks in Sri Lankan context empirical evidence is hardly available.

Therefore, this study attempts to fill the gap of lack of empirical studies on determinants of capital structure of listed banks in CSE in Sri Lanka. Further, this paper attempts to add knowledge to the literature in addition to the study of the determinants of capital structure of listed banks in CSE in Sri Lanka. The sample of this study focuses on 9 banks out of 12 banks which have been continuously listed in CSE for the period of 2007 to 2019.

The remainder of this paper presents the theoretical basis for the analysis, detailed description of the methodology, operational definitions of the variables and model used, results of this analysis comparing the results with the past findings and conclusion.

2. Literature Review

Capital structure of the firm refers to several alternatives that could be adopted by a firm to get the necessary funds for its investing activities. Two major sources of financing that are available to firms consist of debt and equity and mixture of debt and equity is called 'capital structure'. Most of the effort of the financial decision making process is focused on the determination of the optimal capital structure, where the firms' value is maximized and cost of capital is minimized.

The modern work on capital structure theory began by Modigliani and Miller (M&M) in 1958. They prove that the value of the firm is

independent from its capital structure. Further, M&M (1963) published a correction of their previous work and described that the value of the firm is independent from its capital structure, but that the interest expenses on the debt create the difference. They further elaborate the point by saying that this difference is due to the fact that the interest expenses are tax deductible as per the income tax law prevailing in different countries.

In literature, many research studied both technically and empirically on what factors determine the capital structures in the firms.

2.1 Technical Review

M&M's Work provides the basis for technical reviewers to do further research. As a result, different theories of capital structure developed by other researchers like Static Trade-off Theory, Pecking Order Theory and Agency Cost Theory.

Myers (1984) studied that Static Trade-off Theory claimed that a firm's optimal debt ratio is determined by a trade-off between the bankruptcy cost and tax advantage of borrowing, holding the firm's assets and investment plans constant. According to this theory, higher profitability decreases the expected costs of distress and let firms increase their tax benefits by raising leverage. Therefore, firms should prefer debt financing because of the tax benefit. As per this theory, Ross (2002) states that firms can borrow up to the point where the tax benefit from extra money in debt is exactly equal to the cost that comes from the increased probability of financial distress.

Pecking Order Theory is developed by Myers and Majluf (1984) which state that capital structure is driven by the firm's desire to finance new investments, first internally, then with low-risk debt, and finally if all fails, with equity. The Pecking Order Theory discussed the relationship between asymmetric information and investment and financing decisions. According to this theory, informational asymmetry, which the firm's managers or insiders have inside information about the firm's returns or investment opportunities, increases the leverage of the firm with the same extent.

Myers and Majluf (1984), also argued that firms are most likely to generate financial slack (i.e., liquid assets such as cash and marketable securities) to be used for internal funding. Thus, in order to protect present shareholders, firms with financial slack and in the presence of asymmetric information, will not issue equity, even though it may involve passing up a good investment opportunity. If external financing is required, firms will resort to the safest security first. They start with debt, then hybrid securities such as convertible bonds and finally, equity as a last resort.

Moreover, Myers (1984) introduced an implication similar to the Pecking Order Theory known as the Modified Pecking Order Theory. In this framework, both asymmetric information and costs of financial distress are incorporated. When issuing new capital, those costs are very high, but for internal funds, costs can be considered as none. For debt, the costs are in an intermediate position between equity and internal funds. Therefore, firms prefer first internal financing (retained earnings), then debt and they choose equity as a last option.

Agency Theory focused on the costs which are created due to conflicts of interest between shareholders, managers and debt holders. According to Jensen and Meckling (1976), capital structures are determined by agency costs, which includes the costs for both debt and equity issue.

2.2 Empirical Review

There are a large number of potential factors that may have an impact on leverage ratio theoretically. These factors include size of the firm, tangibility, profitability, risk, growth, total debt, return on assets and liquidity.

Since the pioneering work of Modigliani and Miller (1958), the question of what determines a firm's choices of capital structure has been a major field in the corporate finance literature. Several studies have been conducted in developing and developed countries to identify those factors that have an effect on a firm's choice of capital structure.

Titman and Wessels (1988) studied the determinant of capital structure choice by examining them empirically. Their results indicated that debt levels are negatively related to the uniqueness of a firm's line of business. The short-term debt ratio was negatively related to firm size. A strong negative relationship was noted between debt ratios and past profitability which is consistent with the Pecking Order Theory of Myers and Majluf (1984).

In a comparative study, Rajan and Zingles (1995) investigated whether the capital structure in other developed countries is related to factors similar to those influencing the US companies for the period of 1987-1991. They found that firms with more collateralized assets are not highly levered. In addition, they found that profitability and market-to-book ratio are negatively related to leverage.

Booth *et al.* (2001) assessed whether capital structure theory is portable across developing countries with different institutional structures. The sample firms in their study are from Malaysia, Zimbabwe, Mexico, Brazil, Turkey, Jordan, India, Pakistan, Thailand, and Korea. Booth *et al.* (2001) use three measure of debt ratio such as total debt ratio, long-term book debt ratio, and long-term market debt ratio with average tax rate, assets tangibility, business risk, size, profitability, and the market-to-book ratio as explanatory variables. Booth *et al.* (2001) concluded that the debt ratio in developing countries seemed to be affected in the same way by the same types of variables that were significant in developed countries. However, they pointed out that the long-term debt ratios of those countries are considerably lower than those of developed countries. This finding may indicate that the agency costs of debt are significantly large in developing countries or that markets for long-term debt are not effectively functioning in these countries.

The paper of Deesomsak *et al.* (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, they found leverage to be positively related to firm size and

growth opportunities, while non-debt tax shields, and liquidity to be negatively related to leverage.

A study made by Amidu (2007) examined the determinants of capital structure of Ghanaian banks by employing panel regression model. Amidu (2007) has highlighted the importance of distinguishing between long and short forms of debt while he made inferences about capital structure. Amidu (2007) specifically tested the significance of bank size, profitability, corporate tax, growth, asset structure, and risk in determining bank capital structure. The result showed that short-term debt of banks is negatively related to banks' profitability, risk, and asset structure and positively related to bank size, growth and corporate tax. On the other hand, the long-term debt of the banks is positively related to bank's asset structure and profitability and inversely related to bank risk, growth, size and corporate tax. Generally, the variables examined were consistent with the static trade-off and pecking order arguments, with the only exception being risk.

Gropp and Heider (2009) approached the issue from a different perspective. Using a sample of banks from developed countries, they specifically tested the significance of size, profitability, market-to-book ratio, asset tangibility, and dividend paying status in determining bank leverage. In the process, they made a stark distinction between bank book and market leverage as well as control for asset risk and macroeconomic factors.

Gurcharan (2010) analyzed the determinants of capital structure in four countries of the ASEAN members, namely, Malaysia, Indonesia, Philippines and Thailand, with a sample of 155 main listed companies from four selected ASEAN stock exchange index-links. Based on the empirical result, he found that profitability and growth opportunities for all selected ASEAN countries reveal a statistical significance with inverse relationship with leverage. Whereas non-debt tax shield has a significant negative impact on leverage mainly for Malaysia index link companies only. Firm size shows a positive significant relationship for Indonesia and Philippines index link companies. Also, he found that country-effect factors such as stock

market capitalization and GDP growth rate show significant relationship with leverage while bank size and inflation indicate insignificant impacts on leverage.

Although there are number of studies have been done in developed countries on capital structure of listed firms, banks and insurance companies, in Sri Lankan context few researchers have done empirical studies on determinants of capital structure of listed banks and companies.

The paper of Vijayakumaran, R and Vijayakumaran, S (2011) examined the determinants of capital structure in Sri Lanka by using listed companies in CSE in Sri Lanka. Their study revealed that leverage of Sri Lankan firms comparatively low and the size of the firms is positively related to the leverage while profitability is negatively related to the leverage. They suggested that more profitable firms tend to use less leverage and size and profitability have strong effect on long term leverage in Sri Lankan firms.

Recently, Sritharan and Vinasithamby (2014) studied the capital structure of listed banks finance and insurance companies in CSE in Sri Lanka. They identified, debt ratio has a negative relationship with tangibility, profitability, growth, and liquidity. Further, non-debt tax shield is not significantly related to the debt ratio. The results of their study reveal that tangibility and size shows a positive significant relationship with the debt ratio which confirms the Static Trade-off Theory while liquidity shows a negative significant relationship with debt ratio which confirms the Pecking Order Theory. However, profitability and revenue growth are not statistically significant and require further research.

3. Research Methodology

3.1 Data Collection

As described in introduction, this researcher intends to study determinants of capital structure of the listed banks in CSE. This study selected 9 listed banks and all data collected from financial statements published in CSE, data published in web-sites of the

Department of Census and Statistics and CBSL. This research intends to study the relationship between leverage and other seven variables namely, Gross Domestic Production growth rate, inflation rate, total debt to equity ratio, tax, profitability and return on assets. The data collection for this study was based on published secondary data directly and some ratios were arrived at by using published secondary data in order to find out this relationship.

3.2 Analytical Framework

This study uses panel data analysis model with Ordinary Least Square method. Panel is covering cross section data and time series data for the period 2007 quarter 2 to 2019 quarter 4. Frequency of data was quarterly and data consists of 9 banks listed in CSE. This study intends to examine the relationship between leverage and other seven specific variables.

The equation for the regression model as follows;

$$LG = \beta_0 + \beta_1 GDP_GRTit + \beta_2 INFit + \beta_3 TDMit + \beta_4 TAXit + \beta_5 PROFit + \beta_6 \ln SIZEit + \beta_7 ROAit + \varepsilon it(1)$$

LG = Leverage

GDP _ GRT = Gross Domestic Production (Growth Rate)

INF = Inflation Rate

TDM = Total Debt to Equity Ratio

TAX = Corporate tax paid to profit before tax

PROF = Profitability

lnSIZE = Natural logarithm of Size of the firm

ROA = Return on Assets

ε = The error term

3.3 Definition of Variables

This study is based on 2 variables which are dependent variable and independent variables. Dependent and independent variables of this study have been determined according to the results reached by previous studies. Leverage is defined as dependent variable and

Gross Domestic Production growth Rate (GDP growth), Inflation, Profitability, Tax, Debt to Equity Ratio, Size and Return on Assets are considered as independent variables.

3.3.1. Dependent Variable

Previous research studies have used different measures of leverage ratio to present the capital structure of a firm. Leverage refers to the percentage of assets financed by debt. In this research, book value of total equity and book value of debts are used for the calculation of leverage and the same formula is used as a proxy for leverage of the banks.

$$\text{Leverage (LG)} = \text{Total Debt} / \text{Total Equity}$$

3.3.2. Independent Variables

Independent variables of this study are as follows;

I. GDP Growth Rate (GDP_GRT)

There are no empirical studies of relationship between leverage ratio and GDP growth rate. However, as Guzman (2013) said, the severity of banking debt is negatively related to the volatility of GDP growth expectations. According to the conclusion of his research, under macroeconomic ground, a higher volatility of growth expectations, by making governments' borrowing more expensive, leads to a higher use of seigniorage and to more severe inflation and currency crises. When high growth rate is prevailing in the country, the growing firms have to be dependent more upon the equity than on debts. Hence there is a negative relationship between the growth rate and leverage. The same is confirmed by Rajan and Zingales (1995).

II. Inflation Rate (INF)

Inflation is the one of macroeconomic factors that is important in determining leverage of the firms. Historical data shows that inflation is rather unanticipated, suggesting that inflation is also rather uncertain. Chen and Boness (1975) pointed out that uncertain inflation leads to higher cost of capital and less investments. Inflation uncertainty will reduce debt-to-equity ratio and cause a loss of value to the firm's stockholders due to the loss of tax benefit associated with the use of debt. Inflation uncertainty also reduces the number of

investment projects financed by debt. Higher inflation uncertainty increases interest rate uncertainty. Additional risk premium may be added to cost of debt to compensate this risk. As a consequence, the cost of debt will also be higher, hence reducing debt issued by firms under inflation uncertainty.

III. Total Debt to Equity Ratio (TDM)

This issue has been examined and argued by a number of researchers such as Harris and Raviv (1991), Rajan and Zingales (1995), Antonion, *et al.* (2002), and Buferna, *et al.* (2005). This ratio is dependent on money borrowed for financing a firm's assets and is intended to measure the risks which the company is faced through borrowing. Based on Bevan and Danbolt (2002) and Omet and Nobanee (2001), it seems that a positive relationship exists between long-term debts to total debts and long-term debt of the firm. This ratio is intended to measure assets which are financed through long-term debts. There is no doubt that reliance on long-term debts to finance assets involves many risks. However, it is interesting to note that if these debts are properly used, they will generate profitability in favour of the industrial company and will maximize the owner equity. As a result, the relationship between leverage ratio and debt is expected to be positive.

In this study, this variable is defined as;

$$\begin{aligned} \text{Total Debt to Equity Ratio (TDM)} \\ = \text{Total Debt} / \text{Total Debt} + \text{Equity} \end{aligned}$$

IV. Corporate Tax Paid to Profit before Tax (TAX)

The impact of tax on capital structure is the main focus of research done by Modigliani and Miller (1958). Firms with a higher effective marginal tax rate mostly use more debt to obtain a tax-shield gain. According to the Static Trade-off Theory, the benefit of debt is the tax deductibility of the corresponding interest payments. Hence, firms will choose a high debt ratio if it pays a high tax rate to reduce the tax load. As a result, the relationship between leverage ratio and tax paid is expected to be positive.

In this study, this variable is defined as;

$$\begin{aligned} \text{Corporate tax paid to profit before tax (TAX)} \\ = \text{Corporate Tax} / \text{Profit before Tax} \end{aligned}$$

V. Profitability (PROF)

The Pecking Order Theory of capital structure explains that firms which are more profitable would prefer to finance from internal sources rather than the external source and hold less debt level than low profitable firms. A profitable firm should have more internal funds at its disposal to meet its funding needs. According to Modigliani and Miller (1963), there is a positive relationship between leverage and profitability. However, the Pecking Order Theory by Myers and Majluf (1984) states that when the firms need funds, they will prefer internally generated funds instead of external sources of capital. Hence, there must be a negative relationship between profits and leverage of the firm. Rajan and Zingales (1995) also found the negative relationship between leverage and profitability.

This study takes the ratio as follows;

$$\text{Profitability (PROF)} = \text{Profit before Tax} / \text{Total Assets}$$

VI. Size (lnSIZE)

The Trade-off Theory stipulates that firm size could be an inverse with the probability of the bankruptcy costs. Larger firms are likely to be more diversified and loss is less. They have lower costs in the occasion of bankruptcy. Further, Titman and Wessels (1988) explained in their research, that larger firms are more likely to have higher debt capacity and are expected to borrow more to maximize the tax benefit from debt because of diversification. In view of that, size has a positive effect on leverage.

This study arrived at size by obtaining natural logarithm (ln) of the total assets of the banks at the end of quarter 4 of 2019.

$$\text{Size (lnsize)} = \text{Natural logarithm of total assets}$$

VII. Return on Assets (ROA)

The most previous studies state that Return on Assets (ROA) is positive for both private and government owned companies. However, some studies state that the relationship of ROA in private

companies is not statistically significant which implies that ROA does not matter in determination of the capital structure of private firms.

This study defines ROA ratio as follows;

$$\begin{aligned} \text{Return on Assets (ROA)} \\ &= \text{Profit before Tax (Annualized)} \\ &\quad / \text{Total Average Assets} \end{aligned}$$

3.4 Data Analysis Method

Data collected from quarterly financial statements of 9 banks published in CSE was reviewed and analyzed. Descriptive statistics of the variables and different percentiles of the dependent variable were calculated over the sample period from 2nd quarter 2007 to 4th quarter 2019 through excel. Then, using statistical package 'EViews 7' Ordinary Least Squares (OLS), panel regression analysis was carried out to test the relationship between leverage and their potential determinants. Panel data analysis facilitates analysis of 9 cross-sectional and 51 time series data. The total observation for each dependent and explanatory variable was 459. This study used the pooled regression type of panel data analysis. Accordingly, the panel data base created 3,672 data points. Multiple regressions were also used to determine the most significant and influential explanatory variables affecting the capital structure of banks.

3.5 Analysis

3.5.1. Descriptive Statistics

Data collection was consistent of 9 banks covering 12 years period including 51 quarters with seven explanatory variables and one dependent variable. The descriptive statistics of the dependent and explanatory variables for the listed banks are summarized in Table 1 in Annex I.

The mean of the leverage (total debt/total equity) of selected listed banks in Sri Lanka was 1.99 with the standard deviation of 1.15 while banks in developing countries like Ethiopia reported 0.89 (Shibru, 2012). GDP growth rate and inflation showed a mean of 5.52 and 6.92 during the period from 2007 to 2019, respectively. The mean of

the listed banks' size which was represented by the natural logarithm of total assets was 12.03. This study indicates that mean of the profitability is 0.01, the mean of ROA is 2.27, the mean of TAX and TDM indicated as 0.29 and 0.62 respectively. In this study, it indicates that the banks listed in CSE in Sri Lanka financed by debts were high.

3.5.2. Correlation Analysis

Correlation between the explanatory variable and leverage in this study is depicted in Table 2 in Annex I. To find the association of the independent variables with the dependent variable and leverage, the Pearson product moment of correlation coefficient was used.

The correlation matrix shows that leverage was negatively correlated with s GDP growth rate, size, profitability, ROA, and tax paid of the banks. This indicates that listed banks with higher leverage have less profitability, assets, ROA, tax paid and GDP growth rate. However, inflation and TDM have positive correlation with leverage. Further, the result shows that leverage was correlated at 0.87 with TDM and it indicates statistically significant correlation with debt while profitability was statistically significant correlated at 0.74 with ROA.

3.5.3. Panel Data Unit Root Test Analysis

Prior to analysing the variable, it is necessary to check the time series properties by testing the stationary of the variable. If the variable is non - stationary, variables may move together and have a strong correlation among the variables. However, non - stationary variable has to be converted as stationary variables in order to analyse a variable correctly. For that a hypothesis test is carried out at the significance level of 5 per cent.

Hypothesis that was tested in unit root test was as follows;

H_0 : Variables have a unit root

H_1 : Variables are stationary

Unit root test was carried out under Levin, Lin and Chu assuming a common unit root process in order to test stationary. If hypothesis test for unit root levels indicate that there is a unit root in the variables, it has to carry out the same test for unit root by choosing first difference

level in order to convert the variables to stationary. Accordingly, first difference of unit root test under ADF (Augment Dickey Fuller) was carried out. The same hypothesis was tested with IM, Pesaran and Shin W – stat. It was found that there is no unit root in the first differenced variable and reject the null hypothesis. Further, the alternative hypothesis was accepted and it was concluded that all the variables are stationary. The Table 3 in Annex I depicts the results of the unit root test.

3.5.4. Regression Analysis

The equation was designed for panel regression analysis using in EViews 7, Ordinary Least Squares in this study.

$$LG = \beta_0 + \beta_1 GDP_GRTit + \beta_2 INFit + \beta_3 TDMit + \beta_4 TAXit + \beta_5 PROFit + \beta_6 \lnSIZEit + \beta_7 ROAit + \varepsilon_{it}(1)$$

Panel data regression analysis is used for analysis and it indicates that total debt to equity ratio was strongly significant (p-value = 0.00) at 5 per cent level and had positive relationship with leverage. This result is similar to the results that are obtained by Harris and Raviv (1991), Rajan and Zingales (1995), Bevan and Danbolt (2000), and Buferna, *et al.* (2005). Even though, inflation and tax had a positive relationship with leverage, inflation was not statistically significant and tax was statistically significant at 5 per cent level.

GDP growth rate, Size (natural logarithm of total assets of the banks) of the banks, profitability, and ROA had a negative relationship with leverage and size was statistically significant while GDP growth rate, profitability and ROA were statistically insignificant at 5 per cent level. As per the result on profitability, it was revealed that profitable banks accumulate internal reserves and depend less on external funds. This study is consistent with the Pecking Order Theory that suggests profitable firms prefer internal financing. This negative relationship between profitability and leverage was observed in the majority of empirical studies, Rajan and Zingales (1995), Amidu (2007), and Sritharan and Vinasithamby (2014).

3.5.5. Fixed Effect, Random Effect and Hausman Test Analysis

The objective of next analysis was selecting a method of analysis that is suitable to find out relationship between dependent variable and

explanatory variables. Therefore, fixed effect test and random effect test were carried as an initial step of the Hausman test (Lashgari and Ahmadi, 278).

The significant level for the Hausman test, random effect model and fixed effect model of the study are to be 5% according to the Nazir *et al* (136).

Random Effect Test was carried out assuming cross section and period random effect as an initial step of the Hausman test. The hypothesis of the Hausman test is that random effect is appropriate under null hypothesis and if the null hypothesis is rejected, the fixed effect model is appropriate to find out the correlation of leverage and explanatory variables. Table 6 illustrates the results of random effect analysis.

Depending on the results of the Hausman test (Lashagari & Ahmadi, 278) an appropriate model will be used to find out relationship between leverage and GDP growth rate, inflation rate, corporate tax paid to profit before tax, total debt to equity ratio, profitability, size of the banks and return on assets of the banks.

The hypothesis that was used in Hausman test was,

H_0 : Random effect model is appropriate

H_1 : Fixed effect model is appropriate

Table 4 in Annex I illustrates the results of the Hausman test. The Hausman test predicts that the random effects model was better than the fixed effects model as the p-value is higher than 0.05 for dependent variables which implies that the random effects model should be accepted and thus, the analysis based on the fixed effects estimates was rejected.

3.6 Results and Discussion

According to the results of the Hausman test depicts in the Table 4 in Annex I, null hypothesis (H_0) is accepted as the p – value is not significant at 5 per cent level and it is 99%. Null hypothesis is defined as random effect model is appropriate and random effect model was run.

As per the analysis depicted in Table 5 in Annex I, GDP growth rate indicates a negative relationship with leverage and it is insignificant at 5 per cent level in the listed banks in CSE according to this study. There were no empirical studies of relationship between leverage ratio and GDP growth rate in history. However, Guzman (2013) explained in his research, that the severity of banking debt is negatively related to the volatility of GDP growth expectations. When growth rate is high in the country, the country is reluctant to depend on more debt. It therefore leads to reduce leverage and firms finance their projects from the internally generated funds in terms of the Pecking Order Theory by Myers and Majluf (1984).

Inflation indicates a positive relationship with leverage and is not significant at 5 per cent level. According to the Guzman (2013) study, under macroeconomic ground, a higher volatility of growth expectations, by making governments' borrowing more expensive, leads to a higher use of seigniorage and to more severe inflation and currency crises. Chen and Boness (1975) also pointed out that uncertain inflation leads to higher cost of capital and less investments. Inflation uncertainty may also increase interest rate uncertainty and additional risk premium may be added to cost of debt to compensate this risk. As a consequence, cost of debt will also be higher, and therefore debt issued by firms reduces under inflation uncertainty.

In this study, there is a significant negative relationship between leverage ratios and size of the firm. However, in terms of empirical researches, industrial companies with large total assets are capable of diversifying their investments and subsequently, are less vulnerable for bankruptcy and insolvency (Rajan and Zingales, 1995). Moreover, the cost of funding for these companies will be lower, and the debt ratio within the financing structures of major banks is expected to be larger than equity. However, banks in Sri Lanka predict a negative relationship between leverage and the size which is similar to the Pecking Order Theory.

The results of random effect model indicates that profitability had a negative relationship with leverage, and statistically insignificant (p-value = 0.00) at 5 per cent level. This result reveals that, higher profits of the banks increase the level of internal financing and accumulate internal reserves and this enables banks to depend less on external funds. This study is consistent with the Pecking Order Theory which suggests that profitable firms prefer internal financing to external financing.

According to this study, ROA indicates a negative relationship with leverage and is insignificant at 5 per cent level. Hence, Mazhar & Nasr (2006) determined that the relationship of ROA in private companies is not statistically significant which implies that ROA does not matter in the determination of capital structure in developing market like private firms in Pakistan.

There is a positive relationship between tax paid with leverages because of its substitutability of debts in reducing tax burdens. Further, it is significant at 5 per cent level in the banks in Sri Lanka and it consists with Static Trade-off Theory since the benefit of debt is the tax deductibility of the corresponding interest payments. Therefore, firms will choose a high debt ratio if it pays a high tax rate to reduce the tax load.

Total debt to equity ratio was strongly significant at 5 per cent level and had a positive relationship with leverage in this study. The evidence was given by some researchers and they argued that larger firms tend to have more long-term debt because of shareholder lender conflict (Rajan and Zingales, 1995).

4. Conclusion

The main objective of this study was to examine the relationship between leverage and determinants of capital structure based on the variables such as GDP growth rate, inflation, size of the banks, profitability, return on assets, tax paid and total debt to equity ratio in

the banks listed in CSE. Further, this study needed to understand about theories of capital structure that can explain the capital structure of banks in Sri Lanka and to add knowledge to the literature while filling the time gap on study of the determinants of capital structure of listed banks in CSE in Sri Lanka.. The data were collected from published financial statements in CSE web-site from nine banks over the time period from 2007-2019. The collected data were analysed by employing Ordinary Least Square (OLS) model using statistical package 'EViews7'. OLS regression for panel data with cross section random effects was run with the equation developed in the study.

On the basis of the descriptive statistics and Spearman's correlation analysis of banks, this study concludes that listed banks in Sri Lanka employ more debt. Hence, it seemed that the listed banks in CSE follow the Pecking Order Theory as well as Static Trade –off Theory slightly for absorbing tax benefit.

Further, finding of the study suggests that debt to equity ratio and tax were an important variable that influence banks' capital structure and listed banks in CSE mostly depend on debt rather than equity. However, there were no supporting indications of banks' size, ROA and profitability influencing the level of leverage of banks listed in CSE. Further, the study concluded that GDP growth rate in the country, inflation, size, ROA and profitability do not determine the capital structure of banks' listed in CSE in Sri Lanka.

In this study, selected sample size covered market share of 27% of total assets in financial sector and 39% of the total assets in the banking sector in Sri Lanka in the year 2019. Hence, this analyses indicated that debt was significantly related to leverage ratio and banks listed in CSE mainly use debt as external source of finance.

Therefore, this study recommends that the banks should place greater emphasis on the facilitation for optimal capital structure rather than debt in order to obtain sufficient capital to expand their branch network which in turn creates greater market share for them, reduce cost of capital and to mitigate the risk on financing by debt.

Further, the banks have to maintain minimum capital adequacy requirement with buffer in terms of the Basel III in order to absorb adverse shocks. This is explained that the banks in Sri Lanka need to operate in a prudential manner against potential shocks and should have to maintain regulatory capital structure. Therefore, this study recommends to investigate what factors determine the actual level of capital by banks and to maintain appropriate capital structure in terms of the regulation.

This study examined only listed banks in CSE with specific determinants of capital structure of banks because of resource and time limitation. Therefore, it is necessary to conduct more researches to further analyse the issues of this specific study as this is very important to determine the capital structure of the banks, as the banks hold a high percentage of the financial market share in Sri Lanka. It will be more helpful to the policy makers to develop policies more prudently in order to mitigate the risk and strengthen the capital structure to absorb the shocks in the banks.

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Annex I

Table 1: Descriptive Statistics

	LG	GDP	INF	LNSIZE	PROF	ROA	TAX	TDM
Mean	1.99	5.52	6.92	12.03	0.01	2.27	0.29	0.62
Median	1.71	6.10	5.50	12.09	0.01	2.05	0.31	0.63
Maximum	10.50	8.60	28.20	14.16	0.13	39.05	12.25	0.91
Minimum	0.45	1.10	-0.30	9.42	-0.01	-1.44	-1.12	0.31
Std. Dev.	1.15	2.16	5.93	1.14	0.01	2.60	0.60	0.12

Table 2: Correlations

	LG	GDP	INF	LNSIZE	PROF	ROA	TAX	TDM
LG	1.00							
GDP	-0.01	1.00						
INF	0.18	0.24	1.00					
LNSIZE	-0.21	-0.30	-0.27	1.00				
PROF	-0.07	0.20	0.00	-0.02	1.00			
ROA	-0.03	0.22	0.00	-0.13	0.74	1.00		
TAX	-0.21	0.01	-0.02	0.04	-0.09	-0.09	1.00	
TDM	0.87	0.08	0.16	-0.19	-0.01	0.02	-0.18	1

Table 3: Panel Unit Root Test Summary

Method	LG	GDP	INF	LNSIZE	PROF	ROA	TAX	TDM
Levin, Lin & Chu t*	0.0000	0.0000	0.0000	0.0000	0.0028	0.0000	0.0000	0.502
Im, Pesaran and Shin W-stat	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2136
ADF - Fisher Chi- square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1749
PP - Fisher Chi- square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0683

Table 4: Results of Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f. Prob.
Cross-section random	1.202859	70.9904

Table 5: Summary of Random Effect Model

Dependent Variable: LG

Method: Panel EGLS (Cross-section random effects)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	-0.041406	0.013332	-3.105631	0.0620
INF	0.009069	0.004728	1.917983	0.0557
LNSIZE	-0.082236	0.040827	-2.014244	0.0446
PROF	-6.223566	3.131825	-1.987201	0.0475
ROA	-0.001954	0.014901	-0.131142	0.8957
TAX	0.097289	0.043095	-2.257532	0.0245
TDM	8.068418	0.258987	31.15380	0.0000
C	-1.779571	0.582613	-3.054468	0.0024