

Factors affecting Leverage: An empirical analysis of Mauritius companies

Sooraj Fowdar*

*Faculty of Law & Management,
University of Mauritius*
Email: s.fowdar@uom.ac.mu

Matthew J. Lamport

*Faculty of Law & Management,
University of Mauritius*
Email: mlamport@uom.ac.mu

R. Vinesh Sannasee

*Faculty of Law & Management,
University of Mauritius*
Email: rvasan@uom.ac.mu

Ushad Subadar Agathee

*Faculty of Law & Management,
University of Mauritius*
Email: u.subadar@uom.ac.mu

J. Wong Woon Chong

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Abstract

This paper conducts an empirical study in evaluating the factors affecting leverage for firms listed on the Mauritian Official Stock Market. The study was applied for three non-financial sectors namely Commerce, Industry and Leisure & Hotels from 1999 to 2003. The research findings show that there is some mixed support for the pecking order hypothesis. Essentially, growth opportunities and liquidity are important determinants for corporate leverage while profitability, tangibility of assets and non-debt tax shields are not relevant.

Keywords: Pecking Order Hypothesis, Capital Structure, Stock Market, Mauritius, Equity, Debt

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1.0 INTRODUCTION

Modigliani and Miller's (1958) seminal paper on the relationship between firm value and capital structure has fuelled a huge literature ranging from academic theories to practical realities. It is now generally recognized that capital structure or leverage is relevant to firm value. Since the value of the firm is the present value of its expected free cash flow stream using the weighted average cost of capital (WACC) as the discount rate, the capital structure choice of the firm would presumably have an impact on the WACC and the firm's investment decision and ultimately on the value of the firm itself. This explains why a plethora of research has been undertaken in an attempt to identify the determinants of capital structure.

The Pecking Order Hypothesis (POH) is one of the most prominent theories of corporate leverage and is basically based on the argument that external financing is associated with a high level of asymmetric information. Essentially, Myers (1984) refers to the "pecking order" theory as a theory which depicts a situation where capital structures are driven by firms' desire to finance new investment by firstly internal sources (reinvested earnings), then with low risk debt and finally as a last resort by new issue of equity. The motive of such a theory advocates that there is an order in the choice of finance due to the different degree of information asymmetry and this is related to the agency problem embodied in the distinct sources of finance.

As such, new investments should be financed in the first instance by internal sources of funding such as retained earnings since they constitute the cheapest source of funding. Essentially, if retained earnings have been used up, the issue of debt is advocated as it consists of fixed interest payment which does not lead to major fluctuations in cash flows and earnings. As a last resort, the issue of external equity should be considered since external investors are aware of the information disadvantage they have and that as such, they require a lemons premium that raises the required rate of return on external capital relative to its full-information level (Akerlof-1970). Faced with such a dilemma, firm managers acting in the interests of existing shareholders follow a pecking order in their financing decision.

Thus, the POH shows a systematic order in the choice of raising funds for the investment decision. In this respect, the main aim of this study is to analyze the factors affecting leverage based on whether companies in the Mauritian non-financial sectors take into consideration the hierarchy of financing for new investment decision projects, as predicted by the POH. Also, variables from other theories of leverage such as the Trade-off, Modigliani and Miller (1961) and Agency theories, used by various researchers are considered. The study is specifically based on data collected from the annual financial reports of seventeen non-financial companies quoted on the official market (SEM) involved in the sector of Commerce, Industry and Leisure & hotels.

The paper is organised as follows: Section 2 looks at and reviews research undertaken on POH; Section 3 discusses the research methodology; Section 4 present the findings while Section 5 concludes the study.

2.0 LITERATURE REVIEW

There seems to be abundant literature on corporate leverage in developed countries though a limited number of empirical studies are observed from developing countries. For example, Pandey (2001), Muthenheri and Green (2002), Balla and Mateus (2002), Gonenec (2003) and Huang and Song (2002) studied the capital structure choice of firms operating respectively in India, Zimbabwe, Hungary, Turkey and China. Although, researchers have considered a number of variables to explain the level of leverage – company size, profitability, asset tangibility and growth prospects to name a few – the fact of the matter is the number of studies examining the capital structure choice of developing countries is still limited and therefore relatively little is known about the financing activities of firms operating in such countries. Notwithstanding this latter fact, one general observation can be made from the studies conducted by Singh and Hamid (1992) and Singh (1995): using data from a number of developing countries, firms in developing countries relied more heavily on equity finance than debt finance compared to firms in OECD countries. This observation is confirmed by Booth et al. (2001) who analysed the capital structure choice of firms in 10 developing countries - India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and Korea - and concluded that although the capital structure decision is affected by the same variables - average tax rate, asset tangibility, business risk, size, return on assets and market-to-book ratio - as those in developed countries, persistent differences existed across countries, indicating that specific country factors were at work.

The literature on the determinants of capital structure reveals that the choice of explanatory variables is fraught with difficulty. The very fact that related explanatory variables have different regression coefficient signs – some positive and others negative – are evidence of the continuing difficulty in coming up with a universal theory explaining the capital structure choice of firms within and across countries. Three possible capital structure theories have been put forward: Trade-off theory, Pecking Order Theory and Agency Theory. These will now be discussed in the light of empirical evidence and the often conflicting regression coefficient signs of the explanatory variables used in cross sectional regression studies.

Modigliani and Miller (1963) concluded that firms should gear themselves up as much as possible in order for shareholders to benefit from the tax deductibility of interest payments. However, the costs of too high a gearing level are those associated with financial distress and the personal tax expense bondholders incur when they receive interest income (Miller 1977). The essence of the static trade off theory is that a value maximising firm will consider the trade off between the tax shelter provided by debt and the cost of financial distress (Brealey and Myers, 2003). The firm will thus pursue an optimal capital structure or target debt ratio by considering the marginal costs and benefits of each additional unit of financing, and then choose the form of financing that equates these marginal costs and benefits. It should be pointed out that it is not leverage itself which precipitates the company into bankruptcy, but rather the business risk faced by the firm as measured by the volatility in its earnings. Baxter (1967) and Warner (1976) support

the theory that the risk and expected costs of bankruptcy affects capital structure of firms and that volatility of earnings has a negative influence on capital structure.

Tax deductibility of interest payments constitutes an advantage to the shareholder only if there is enough taxable income to offset the interest expense. It can be argued that the greater the availability of non-debt tax shields, the lower the taxable income and the lesser the incentive for further tax saving derived from interest payments on debt finance. (Ross,1985). Previous studies, however, have provided inconclusive and contradictory evidence on whether non-debt tax shields crowd-out debt financing. For instance, the findings of Titman and Wessels (1988) are particularly anomalous. For a sample of firms, they estimated the relationship between leverage and several proxies for non-debt tax shields. When leverage was regressed on annual depreciation as a proportion of total assets, the relationship was found to be negative and in support of crowding-out effect. However when leverage was regressed on annual depreciation as a proportion of pretax cash flow, the relationship was found to be positive thereby refuting crowding-out effect. Similarly, Downs (1993) shows that contradictory inferences may result from analysis of annual tax depreciation deductions instead of discounted tax shields. His findings also suggest that firms with substantial cash flow from depreciation exploit their higher debt capacity by maintaining a capital structure with significantly more debt than otherwise.

Harris and Raviv (1991) found an inverse relationship between leverage and volatility, advertising expenditure, the probability of bankruptcy, profitability, and uniqueness of the product and a positive relationship between leverage and fixed assets, non-debt tax shields, growth opportunities and firm size. One can easily understand the positive relationship between leverage and fixed assets. The greater the tangibility of assets, the greater their collateral value and the greater the debt capacity of the firm. Tangibility of assets is therefore deemed to be a major determinant of the level of debt finance (Rajan and Zingales, 1995). However, although the inverse relationship between on the one hand, leverage, and volatility and probability of bankruptcy, on the other, supports the trade-off theory, the matter is less clear for the variables firm size and profitability. It could be argued that firm size and profitability are interrelated in the sense that if a firm is profitable it will grow in size and have a greater volume of assets which may serve as collateral for greater debt finance thereby implying that the variables firm size and profitability should be positively related to leverage.

Similarly, due to the tax deductibility of interest, it is argued that highly profitable companies tend to have higher levels of debt (Modigliani and Miller, 1963). However, in contrast, Myers and Majluf (1984) argued that that as a result of asymmetric information companies would prefer internal sources of finance to avoid the possible adverse signals given out by either equity or debt financing. Consequently, following this line of reasoning – which is the basis for the Pecking Order Theory - more profitable companies would be expected to have lower debt levels and higher retained earnings. Kester (1986), Titman and Wessels (1988) and Michaelis et al. (1999) find leverage to be negatively related to the level of profitability thereby providing further support for the Pecking Order Theory.

Brealey and Myers (2003), however, point out that the pecking order theory is less successful in explaining inter-industry differences in debt ratios.

The pecking order theory suggests that firms place a greater demand on the internally generated funds of the firm. Consequently, firms with relatively high growth will tend to look outside the firm to finance the growth and new investments. Therefore these firms will look to short-term less secured debt then to longer-term more secured debt for their financing needs. In other words growing firms that need funds prefer debt to external equity. Michaelas et al (1999) argue that, in the case of SMEs, growth opportunities and leverage are positively related because SMEs mainly use short-term debt financing. Thus based on the pecking order considerations, the relationship between growth opportunities and leverage is predicted to be positive.

However in line with Jensen and Meckling's (1976) agency theory of debt, conflicts between owners and lenders should lead to a negative relationship between growth and debt levels. In support of the theoretical predictions of the agency theory, Myres (1977) finds that firms with growth opportunities should use less debt in order to mitigate agency problems. Myers argues that due to information asymmetries, companies with high leverage ratios might have the tendency to undertake activities contrary to the interests of debt-holders. To compensate for this risk, debt-holders would charge a higher risk premium and also impose debt covenants which would restrict the freedom of directors and managers and result in a. Therefore, to avoid such debt agency costs, growing firms are expected to be less reliant upon debt finance.

Fama and French (2002) highlighted that the pecking order and trade off theories share many common predictions about the determinants of leverage. However, a study by Prasad, Green and Murinde (2001a) concluded that the evidence on trade-off versus pecking order remain inconclusive. However, they also observed that the overwhelming bulk of the available empirical research on corporate capital structure is concerned with the major industrial countries, and there has been relatively little work on developing countries or the transition economies.

3.0 RESEARCH METHODOLOGY

The main aim of this study was to investigate whether firms do account for POH in their funding decision for new investment, especially given the dynamic local financial environment. In other words, do companies nowadays disregard internal source in favour of external funding

3.1 Sources of Data

Firms were selected from 3 non- financial sectors of the Stock Exchange of Mauritius namely Commerce (7 companies), Industry (7 companies) and Leisure and Hotels sectors (3 companies). The data were collected from the financial statements, mainly Balance Sheet and Profit and Loss Accounts , for the period 1999 to 2003.

3.2 Variables Collected

For the purpose of the statistical techniques, the variables and their related definitions, as used, are listed below: -

- **Long Term Debt** – consist of debt with maturity exceeding one year.
- **Fixed Assets** – the net book value of property, plant and equipment available in the Balance Sheet.
- **Total Assets** – represent the sum of all assets.
- **Market Value of Equity** – the value of the share of the respective company at the price prevailing on the market.
- **Book Value of Equity** – the equity value in the Balance Sheet.
- **Sales** – the turnover of the company for that particular year.
- **Earnings** – the profit or loss made during the year before adjusting for interest and tax.
- **Net Capital Employed** – from the Balance Sheet (Shareholders' Fund + Long Term Liabilities).
- **Risk** – volatility proxy for the probability of financial distress.
- **Current assets** – consist of short-term assets of the company.
- **Current liabilities** – is short-term credit in Order to finance the business within a period of less than one year.
- **Depreciation** – the annual wear and tear of the long-term assets owned by the company at the end of its financial year.

3.3 Econometric Methodology

The regression model is derived from previous studies namely Rajan and Zingales (1995), Frank & Goyal (2003) and Ozkan (2001). As such, the model consists of a hybrid of different regressions as proposed by the above-mentioned studies and is as follows:

$$AFL_{it} = \alpha + \beta_1 S_{it} + \beta_2 G_{it} + \beta_3 P_{it} + \beta_4 T_{it} + \beta_5 NDTS_{it} + \beta_6 L_{it} + \beta_7 R_{it} + U_{it}$$

The above model is run for 17 companies operating in the non-financial sectors for the period 1999 to 2003 using a panel data approach. Table 1 gives a brief description of the variables used in the regression model.

SYMBOLS	MEANING	Calculations	Expected Sign of Coefficient
AFL_{it}	Aggregate financial leverage	Long Term Debt/ Total Assets	
S_{it}	Size	Natural Log of Sales = Log (sales)	+
G_{it}	Growth Opportunities	Annual % change in Total Assets	-
P_{it}	Profitability	<u>Earnings before Interest and Tax</u> Sales	-
T_{it}	Tangibility of Assets	<u>Fixed Assets</u> Total assets	+
NDTS_{it}	Non Debt Tax Shields	<u>Annual Depreciation Charge</u> Total Assets	+
L_{it}	Liquidity	<u>Current asset</u> Current liabilities	-
R_{it}	Risk	Standard deviation (share prices)	-

Table 1: List of Formulas and their Expected Sign of Coefficient

4.0 ANALYSIS AND FINDINGS

The present section focuses on the empirical results regarding Pecking Order Hypothesis's (POH) validity in the three non-financial sectors. A descriptive analysis is initially carried out.

4.1 Descriptive Analysis

A brief descriptive analysis is conducted on the variables specified in the econometric model.

Variable	mean	median	25th Percentile	75th Percentile
AFL_{it}	0.406404	0.3508	0.2582	0.5072
S_{it}	8.853965	8.8681	8.5857	9.1984
G_{it}	0.276655	0.0741	0.0012	0.1954
P_{it}	0.32516	0.1047	0.0535	0.1643
T_{it}	0.589552	0.4532	0.3142	0.5746
NDTS_{it}	0.147921	0.0406	0.0273	0.0681
L_{it}	1.925861	1.2574	0.9206	2.1287
R_{it}	0.111189	0.0144	0.1	0.1194

Table 2: Descriptive Statistics

Table 2 provides the basic descriptive statistics. The median leverage is below mean leverage and there seems to be a large cross-sectional difference (may be because of each non-financial sector's specific characteristics) so that the 25th percentile of the AFL is 0.2582 while the 75th percentile is 0.5072. Also, it is observed that many of the factors have mean values that diverge sharply from the median.

Furthermore, the correlation between leverage and the other factors was also carried out. To this end, a simple correlation analysis was conducted and the results are as follows:

Variable (N=85)	Correlation Value with Leverage
S_{it}	0.374392
G_{it}	-0.08126
P_{it}	-0.01014
T_{it}	-0.03092
NDTS_{it}	-0.02076
L_{it}	-0.21626
R_{it}	-0.02517

Table 3: Correlation values

From table 3, it can be observed that size is positively related to leverage while there is a negative relationship between leverage and the remaining other factors. In addition, all the factors have the expected sign in line with the pecking order hypothesis, except for Tangibility of Assets and Non Debt Tax Shields.

4.2 Econometric Analysis

Using the above mentioned econometric model, and based on the data from 17 companies for all the non-financial sectors for the period 1999 to 2003, the following results were obtained¹.

AFL_{it} = α + β₁ S_{it} + β₂ G_{it} + β₃ P_{it} + β₄ T_{it} + β₅ NDTS_{it}+ β₆ L_{it} + β₇ R_{it} +U_{it}		
Independent variables	coefficient	P-value
Constant	- 1.558187*	0.006
S_{it}	0.2319946*	0.000
G_{it}	- 0.0975307***	0.070
P_{it}	- 0.0009322	0.973
T_{it}	- 0.0210516	0.739
NDTS_{it}	0.045213	0.796
L_{it}	- 0.035792**	0.019
R_{it}	0.1120395	0.448
No. of observations	85	
Adjusted R ²	0.2344	

*Source: computed: (***) , (**), (*) indicate significance at the 10, 5, 1 % levels respectively*

Table4: Regression Results based on all sectors

The results for each explanatory variable are considered individually in the following sub-section.

¹ The Hausman test was conducted to decide between fixed and random model. With a p-value of 0.9998, the null hypothesis that difference in coefficients is not systematic is accepted such that the random model is favoured.

4.2.1 **Size (S_{it})**

In line with the POH, the coefficient of size is significant at 1% level and reveals a positive relationship with aggregate financial leverage. This may suggest that large firms incur lower costs in issuing debt and may even have better bargaining power over the creditors. Many studies have suggested that there is a positive relation between leverage and size of the firm². Thus, large firms are expected to hold more debt in their capital structure than small firms.

Moreover, Rajan and Zingales (1995) suggested that larger firms tended to disclose more information to outside investors than smaller ones, thus enhancing their credit ratings. Besides, larger firms were often more diversified and had more stable cash flow such that they were less prone to bankruptcy. Hence, the above arguments suggest that size was positively related to leverage. Bevan and Danbolt (2000) also found a significant positive relationship between company size and long-term debt since small companies make less use of short-term secured debt than large companies.

4.2.2 **Growth Opportunities (G_{it})**

It can be observed that there is a negative relationship between growth opportunities and leverage and the coefficient is significant at 10% level. Essentially, under the POH, Myers (1977) suggested that the amount of debt issued by a firm was inversely related to growth opportunities since future investment opportunities would increase the value of the firm when undertaken.

In a similar vein, Titman and Wessels (1988) found a negative relationship between growth and leverage given the reluctance of bondholders to lend to equity-controlled firms, since they tend to invest sub-optimally to expropriate wealth from bondholders.

4.2.3 **Profitability (P_{it})**

The coefficient estimate for profitability is insignificant. Essentially, from the study of Myers (1984) and Myers and Majluf (1984), higher profitability corresponded to a lower debt ratio holding other things being equal, since firms would first use retained earnings and if necessary, they will then move to bonds and new equity. However, from the results obtained, there seems to be no support in favour of this prediction.

4.2.4 **Tangibility of Assets (T_{it})**

In contrast to the predictions of the POH, the coefficient estimate for tangibility of assets is insignificant. Essentially, as tangibility of assets increases, the ability of the firm securing its debt also increases. Harris and Raviv (1990) and Rajan and Zingales (1995) suggested that leverage would increase with liquidation value and that leverage would be positively correlated to tangibility. Firms in the non-financial sectors did not seem to support this hypothesis.

² Rajan and Zingales, (1995) and Bevan and Danbolt (2000)

4.2.5 **Non Debt Tax Shield (NDTS_{it})**

In general, substantial NDTS can act as attractive collateral and as such they can induce high debt levels, which may lead to a positive relationship. However, although the Non Debt Tax Shield coefficient estimate is positive as expected, it was nevertheless insignificant.

4.2.6 **Liquidity (L_{it})**

From the above result, Liquidity has the expected negative sign and is significant at 5% level. Essentially, under POH, liquidity is considered as negative debt since it reduces the need to take on debt. Ozkan (2001) stated that such negative relationship emanated from the potential conflicts between shareholders and bondholders. The rationale is that the greater the liquidity level, the greater the ease with which shareholders can manipulate the liquid assets of firms at the expense of bondholders. It can therefore be inferred that firms that has more liquid assets are less likely to have recourse to debt.

4.2.7 **Risks (R_{it})**

Volatility or business risk is a proxy for the probability of financial distress and it is generally expected that risk would be negatively related to leverage since firms take less leverage in situation of high risk to avoid financial distress. From the above results, the coefficient estimate for risk was found to be insignificant.

4.3 Econometric Methodology- Controlling for the sectors

A dummy variable is added in the model for each sector in order to control for sectoral characteristics and the modified model is as follows:

$$\text{AFL}_{it} = \alpha + \beta_1 S_{it} + \beta_2 G_{it} + \beta_3 P_{it} + \beta_4 T_{it} + \beta_5 \text{NDTS}_{it} + \beta_6 L_{it} + \beta_7 R_{it} + \beta_8 \text{DumC}_{it} + \beta_9 \text{DumI}_{it} + \beta_{10} \text{DumH}_{it} + U_{it}$$

Where DumC_{it}, DumI_{it} and DumH_{it} are dummy variable for the commerce, industry and hotel and leisure sectors.

Based on the data of 17 companies for the period 1999 to 2003, the results are as follows³:

³ The constant term is dropped because of the dummy variables to avoid perfect collinearity.

$AFL_{it} = \alpha + \beta_1 S_{it} + \beta_2 G_{it} + \beta_3 P_{it} + \beta_4 T_{it} + \beta_5 NDTs_{it} + \beta_6 L_{it} + \beta_7 R_{it} + \beta_8 DumC_{it} + \beta_9 DumI_{it} + \beta_{10} DumH_{it} + U_{it}$		
Independent variables	coefficient	P-value
S_{it}	0.2174047*	0.001
G_{it}	-0.1274032**	0.013
P_{it}	-0.003569	0.886
T_{it}	-0.0015208	0.980
$NDTs_{it}$	0.1072833	0.511
L_{it}	-0.0418448*	0.004
R_{it}	0.059776	0.654
$DumC_{it}$	-1.372719**	0.020
$DumI_{it}$	-1.428094**	0.011
$DumH_{it}$	-1.529088*	0.009
No. of observations	85	

Source: computed: (***), (**), (*) indicate significance at the 10, 5, 1 % levels respectively

Table 5: Regression Results-sectoral view

From table 5, the results seem consistent with the findings obtained earlier. Essentially, size, growth opportunities and liquidity have the expected sign and are all significant. However, the coefficient estimates for the dummy variables for the three non-financial sectors are all significant at 5% level and are all negative.

5.0 SUMMARY AND MAIN FINDINGS

The aim of the present study was to test whether the Pecking Order Hypothesis (POH) holds for non-financial firms in Mauritius. The results obtained suggest that size, growth opportunities and liquidity were important determinants for corporate leverage. Essentially, the findings showed that large firms hold more debt in their capital structure than smaller firms; the amount of debt issued by a firm was inversely related to growth opportunities; and firms which had more liquid assets were less likely to have recourse to debt. However, there seems to be no reliance on retained earnings, which may suggest that the pecking order hypothesis may not be relevant in the Mauritian context. In addition, non-debt tax shield and tangibility of assets seemed to have no major significance in corporate decisions. As such it could be argued that there is some mixed support for the relevance of POH for non-financial firms in Mauritius.

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