CAPITAL STRUCTURE AND PERFORMANCE OF MAURITIUS LISTED FIRMS: THEORETICAL AND EMPIRICAL EVIDENCES

by

Roshan Boodhoo

roshanboodhoo@intnet.mu

Year 2009

To my fiancée Deeptee

Table of Contents

" What is now proved was once only imagined."

– William Blake

PREFACE

This book represents an improved version of the dissertation I submitted for the BSc (Hons) Banking and International Finance at the University of Technology Mauritius. The dissertation obtained a distinction. The reader is required to have a basic knowledge of corporate finance even though this book has been written to ensure that it is understandable to each and everyone. This book presents empirical findings in support of the main theories developed on capital structure and its determinants, and on the impact of debt ratio on firm's performance. Empirical results based on 2002 to 2006 accounting data for 40 Mauritian firms are consistent with past literature on the topic, and imply that the agency costs, tax rate, capital expenditures and the ownership structure play a fundamental role in financing decision. Unexpectedly, performance and tangibility, which have been extensively considered as important determinants in financing decision, are not

statistically significant to the current model. The book provide also additional support to the hypothesis of the existence of an optimal debt ratio, which balances the tax deductions gains from high leverage with the additional expenses that it implies, namely the cost of servicing the debt, and all the costs related to the increased risk of financial distress and bankruptcy. Taken as a whole entity, the optimal capital structure for Mauritian firms analysed ranges somewhere around 50 percent, within which the marginal benefits derived from leverage are equal to the marginal costs.

Keywords: Capital Structure; Financial Leverage; Stock Market; Corporate Finance

Chapter 1

INTRODUCTION

Capital structure has always been one of the main topics among the studies of finance scholars. Its importance derives from the fact that capital structure is tightly related to the ability of firms to fulfill the needs of various stakeholders. The last century has witnessed a continuous developing of new theories on the optimal debt to equity ratio. The first milestone on the issue was set by Modigliani and Miller (1958), whose model argued on the *Irrelevance* of the capital structure in determining firms' value and future performance.

However, many authors have successively proved that a relationship between capital structure and firm value actually exists (e.g., Lubatkin and Chatterjee, 1994). The same Modigliani and Miller (1963) asserted that their model was not effective anymore if tax was taken into consideration. They

demonstrated that the existence of tax subsidies on interest payments cause the value of the firm to increase when equity is traded off for debt.

More recent literature, however, tends to be less interested on how the capital structure determines firm's value per se, and more on how changes in the capital structure of a company affects its governance structure which, consequentially, influences the ability of a firm to make strategic choices (Hitt, Hoskisson, and Harrison, 1991), and thus its overall performance (Jensen, 1986). Nowadays, the major concern for capital structure is how to resolve the conflict between owners and managers over the control of corporate resources (Jensen, 1989).

After more than fifty years of studies, economists have not reached an agreement on how and to which extent the capital structure of firms' impacts on their value, performance and governance. However, the studies and empirical findings of the last decades have at least demonstrated that capital structure has more

importance than in the simple Modigliani-Miller model. Probably we are far from reaching a consensus on the perfect combination between equity and debt, but the efforts of fifty years of studies have provided the evidence that capital structure does affect firm value, does affect executives' behaviour, and does affect future performance of the company.

After a brief summary of the theoretical literature on the different theories developed on the capital structure issue, this book will provide empirical evidence on the main determinants of capital structure and on whether capital structure does or does not affect firm's performance. The analysis is conducted on a sample of 40 companies listed on the Stock Exchange of Mauritius (SEM) whose data were averaged and divided into 6 main sectors[1]. The determinants of leverage will be investigated by using panel data and the estimation methods will consist of descriptive statistics, correlations, and panel regressions supported by various diagnostic tests.

The book is organised as follows: Chapter 2 consists of a review of the literature available on the different theories developed on capital structure. Chapter 3 describes the sample and the data used for the estimation of the equations. Chapter 4 and 5 present respectively the model used to analyse the determinants of capital structure and the empirical results. On the other hand, Chapter 6 presents the second analysis, which investigates the effect of financing decision on corporate profits. The results are provided and explained in Chapter 7. Finally, Chapter 8 summarises the main findings of the current study and concludes.

[1] It would have been more appropriate to classify the firms into industries rather than sectors. However, for the present study, this is not possible since there is only a small number of firms listed on the Stock Exchange of Mauritius compared to stock markets in other major countries like USA where hundreds of companies are listed.

Chapter 2

LITERATURE REVIEW

In this section a brief summary of the theoretical literature on the different theories developed on capital structure is provided. However, this is simply a summary of the main arguments presented in the last fifty years and, by no means; it should be considered as a complete survey.

2.1 CAPITAL STRUCTURE, FIRM VALUE AND PERFORMANCE

An appropriate capital structure is a critical decision for any business organization. The decision is important not only because of the need to maximise returns to various organizational constituencies, but also because of the impact such a decision has on an organization's ability to deal

with its competitive environment. The prevailing argument, originally developed by Modigliani and Miller (1958), is that an optimal capital structure exists which balances the risk of bankruptcy with the tax savings of debt. Once established, this capital structure should provide greater returns to stockholders than they would receive from an all-equity firm.

We argue that the use of leverage either to discipline managers or to achieve economic gain is the 'easy way out', and, in many instances, can lead to the demise of the organization. The fact that an optimal capital structure has not been found is an indication of some flaw in the logic.

Modigliani and Miller (1963) argued that due to tax deductibility of interest payments the appropriate capital structure for a firm is composed entirely of debt. Brigham and Gapenski (1996), however, assert that the Miller-Modigliani (MM) model is probably true in theory, but in practice, bankruptcy costs exist and they increase when

equity is traded off for debt. Hence, they argue on an optimal capital structure that is reached when the marginal cost of bankruptcy is equal to the marginal benefit from tax-sheltering provided by the increase in the debt ratio. The task of efficient managers is thus to recognise when this optimal capital structure is achieved and to maintain it over time. In doing so, they will be able to minimise the weighted average cost of capital (WACC) and financing costs, and thus they will maximise firm's performance and value.

In theory, modern financial techniques would allow top managers to calculate accurately optimal trade off between equity and debt for each firm, in practice; however, many studies found that most firms do not have an optimal capital structure (Simerly and Mingfang, 2000). This is due to the fact that managers do not have an incentive to maximise firm's performance because their compensation is not generally related to it. Moreover, since managers do not share firm's profits with shareholders, they are very likely to

increase company's expenditures by purchasing everything they like and surrounding themselves of luxury and amenities. Hence, the main concern of shareholders is ensuring that managers do not waste firm's resources and run the firm in order to maximise its value, which entail finding a way to solve the principal-agent problem.

2.2 AGENCY THEORY

The agency theory concept was initially developed by Berle and Means (1932), who argued that due to a continuous dilution of equity ownership of large corporations, ownership and control become more and more separated. This situation gives professional managers an opportunity to pursue their own interest instead of that of shareholders (Jensen and Ruback, 1983).

In 'theory', shareholders are the only owners of a company, and the task of its directors is merely to ensure that shareholders' interests are maximised. More specifically, "The 'duty' of directors is to run the company in a way which maximises the long term return to the shareholders, and thus maximises the company's profit and cash flow (Elliot, 2002, p. 789).

However, Jensen and Meckling (1976) observed that mangers do not always run the firm they work for to maximise shareholders' wealth. From this observation, they developed their agency

theory, which took into account the principal-agent relationship as a key determinant in determining firm performance. According to their definition, “An agency relationship is a contract under which one or more persons (the principal[s]) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent (Jensen and Meckling, 1976, p. 308).

The problem is that the interest of the principal and the agent are never exactly the same, and thus the agent, who is the decision-making part, tends always to pursue his own interests instead of those of the principal. It means that the agent will always tend to spend the free cash flow available to fulfill his need for self-aggrandisement and prestige instead of returning it to shareholders (Jensen and Ruback, 1983).

Hence, the main problem faced by shareholders is to ensure that managers will return excess cash flow to them (e.g. through dividend payouts), instead of having it invested in

unprofitable projects (Jensen, 1986). If the principal wants to make sure that the agent acts in his interests he must undertake some *Agency Costs* (e.g. the cost of monitoring managers). The more the principals want to control manager decisions the higher their agency costs will be.

Nevertheless, recent research has discovered that capital structure can somewhat cope with the principal-agent problem without substantially increasing agency costs, but simply by trading off equity for debt (Pinegar and Wilbricht, 1989). Lubatkin and Chatterjee (1994) argue that firms can discipline managers to run businesses more efficiently by increasing their debt to equity ratio. Debt creation ensures contractually that managers will return excess cash flow to investors instead of investing it in project with negative NPVs. This is due to the fact that high degrees of leverage entail high interest expenses, which force managers to focus only on those activities necessary to ensure that the financial obligations of the firm are met. Hence, by having less cash flow available,

managers of highly leveraged firms see their ability of using the firm's resources for discretionary – and often useless – spending, dramatically reduced.

Therefore, firms which are mostly financed by debt give managers less decision power of those financed mostly by equity, and thus debt can be used as a control mechanism, in which lenders and shareholders becomes the principal parties in the corporate governance structure. Managers that are not able to meet debt obligations can easily and promptly be displaced in favor of new managers that can better do stakeholders' interests. Leveraged firms, therefore, are somehow better for shareholders because they ensure them that managers do not have the ability (and the cash) to waste the company's resources in useless expenses. The ultimate outcome of debt creation is thus to transfer wealth from the organization and its managers to the investors (Jensen, 1989).

This reasoning may lead to the conclusion that debt financed firms are always better for investors than equity financed firms. It is logical,

therefore, to wonder why not all the firms are mostly financed by debt. The answer lays in the fact that debt financing increases the cost of capital and other costs: highly leveraged firms are more likely to face cash problems, which increases their likelihood of bankruptcy, and thus increases also all the costs related to bankruptcy. Moreover, highly leveraged companies, which are generally considered risky companies, tend to be low-rated by rating agencies. This classification as risky companies increases their overall cost of capital, since they must guarantee higher returns than those guaranteed by well-rated firms if they want to attract investors.

2.3 THE SHORTCOMING OF DEBT FINANCING: CORPORATE GOVERNANCE AND BANKRUPTCY COSTS

The obvious result of an increase of debt in the capital structure is that debt-holders become key players in the governance of the firm. The more equity is traded off for debt the more debt-holders can exercise their decisional influence on the corporate strategies to be pursued. The relationship between shareholders and debt-holders may become difficult and generate conflicts because the two groups of stakeholders do not share the same interests.

Debt-holders are only interested in making sure that the interest and principal payments they should receive are due, as specified in the contract they stipulated with the firm. Shareholders, on the contrary, are obviously interested only in the return above the amount required to meet debt expenses: if income before interests is equal to the interest

expense, debt-holders will be able to collect their money, and thus they will be satisfied, however, nothing would be left for shareholders. This implies a conflict of interests because on average shareholders will seek investment opportunities with higher expected return, and thus riskier than debt-holders would prefer. As a result, when managers will pursue riskier activities with higher expected returns, debt-holder will charge higher prices for debt in order to establish a greater control on top managers, preventing them from investing funds in risky projects. This conflict of interest might render the governance of the firm extremely awkward, because managers, shareholders, and debt-holders will try to impose different corporate strategies.

Nevertheless, the greater external control exercised by debt-holders may also exert negative results on firm's performance and on its overall value: debt-holders control may interfere with the firm's ability to invest. Firm desiring to engage in profitable undertaking or in investment that will

enhance the long-term ability of generating cash, might not be able to do so because debt-holders prefer to invest in less risky, though less profitable, projects.

However, the bigger problems with debt-holders will be faced by those managers who are not able to meet their debt obligations. Companies that cannot honor their liabilities with banks are very likely to lose their independence completely. For example, the banks to which the interests are due might force the company to accept some of their officers in the board of directors of the company. The bank officers will interfere in the decisional process and in extreme cases they can also set a new corporate strategy. This decrease in managers' decisional power will almost certainly lower the overall value of the firm.

In addition, external forces will exert a significant impact on firm's market value: when deciding to invest in the share of a given company, investors will also take into account any potential bankruptcy costs. As a result, the firms which are

more likely to go bankrupt have it reflected in their share price.

Employee's lack of motivation can be considered as another indirect cost of bankruptcy: the employees of risky companies tend to perceive their future as precarious and their pensions in danger, and thus they will demand far higher wages to compensate their risk. This factor will not only dramatically increase the company's wage expenditures, but also decrease productivity – since such employees will tend to work more in the aim of achieving short-term goals than long-term uncertain ones.

Bankruptcy cost include also those related to deteriorating credit terms with customers and suppliers: on one hand, customers will be less willing to buy the products of a firm with financial problems because warranties and other after sales services are at risk; on the other hand, suppliers do not want to take the risk of entering in long-term contracts with firms likely to go bankrupt.

Considering the shortcomings of both equity financing and debt financing, it could be argued that debt financing should be preferred every time firms have free cash flows available.

2.4 FREE CASH FLOW THEORY

The Free cash flow argument advanced by Jensen (1989) states that when top managers have free cash flow available, they tend to invest it in projects with negative Net Present Values instead that paying it out to shareholders as dividends. This is due to the fact that managers' salary increase with increase in turnover and thus managers have an incentive to acquire other companies or investing in operations to increase the size of the company they work for even when these investments have a negative NPV. Some studies have found that for 10% increase in company turnover, managers' compensation tend to increase on average by 20-30% (Lambert and Larcker, 1986).

However, since free cash flow is defined as the amount of money left after the firm has invested in all available projects with positive net present values (Jensen, 1986), calculating the exact amount of free cash flows is extremely complicated because it involves a perfect knowledge of all available

investment opportunities of a firm. Testing the Jensen free cash flow argument is thus very cumbersome. Past empirical studies have used very different proxies for the quality of investment opportunities, and as a consequence, their results were very different and often contradictory. The empirical research conducted by Lang, Stulz and Walking (1991),

However, it is probably one of the most reliable since it uses the proxy for the quality of investment opportunities that is believed to be the more accurate among most economists, namely Tobin's q. Tobin's q is defined as the ratio of the market value of the firm's assets to their replacement cost. Under the hypothesis of the study of Lang, Stulz and Walking (1991), firms with high 'q' are likely to have investment opportunities with positive NPV, and thus they are likely to use their funds productively. Firms with low 'q', on the contrary, are likely to have only investment opportunities with negative NPV and thus they should pay excess funds out in dividends to

shareholders. The results of their empirical study support the free cash flow hypothesis: their regression show that an increase of free cash flow of 1% decreases the value of common stock of about 1%. As a result, it can be concluded that cash flow increases the agency costs of firms with poor investment opportunities.

2.5 CAPITAL EXPENDITURES

Free cash flow theory argued that the cash flow of firms with poor investment opportunities should be minimised in order to prevent managers from wasting firm's resources in unprofitable investments. Nevertheless, it could be argued that free cash flow theory considers only the positive effects resulting from a reduction of free cash flow, but neglect to put into account the negative signaling effect that a reduction in investments are likely to exert on shareholders.

Many recent studies have tried to fill this gap in the free cash flow theory by investigating the effects of announcements of corporate capital expenditure on the market value of the firm. Their results, however, are very unclear and not always in agreement with each other, leaving financial literature with very little evidence on the effect of corporate investment decisions on firms' market value (e.g. Vermaelen, 1981; Brickley, 1983). The difficulty in finding a definite relationship between

the two variables is probably due to the fact that it changes with the industry being examined. In fact, McConnel and Muscarella (1985) provide statistical evidence that announcements of increases in planned capital expenditures increase the market value of common stock only in industrial firms, while for public utility firms, which are on average far less investment opportunities with positive NPV, neither announcements of increases nor announcements of decreases in planned capital expenditures have an impact on market value of common stock.

2.6 EQUITY CONCENTRATION AND PERFORMANCE

As we have seen in the last paragraphs, managers tend to pursue their own interests instead of those of shareholders, and thus they tend to use companies' resources to fulfill their own needs and desire of prestige. Some studies, however, have found that this kind of management behavior is particularly true in companies with a high percentage of equity financing, where there are many shareholders with very small shareholding (Lambert and Larcker, 1986). In such a situation, no any shareholder has enough power to control managers; reaching an agreement, thus, is extremely difficult, and when shareholders are not happy on the way the company is ran, they tend to sell their shares instead of trying to cope with the problem. On the other hand, companies with definite majority shareholders, who can easily meet together and reach an agreement on how the firm should be ran, tend to have managers with less power.

However, the only way to ensure that managers will act in the interest of shareholders is to give them shares of the company they are in charge of, so that they will become shareholders themselves. A past research on American companies has shown that linking management and ownership increase the company's profitability dramatically (Dolmat-Connel, 2002).

In *The Prince*, the Italian writer Niccolò Machiavelli stated that it is in the human nature to seek one's own benefit and profit even when it implies somebody else ruin. In the light of this precious Renaissance teaching, I would argue that the interest of shareholders and managers should be linked together. In doing so, managers could seek for their own profit and at the same time increase that of shareholders. It is probably due to this reflection that Management Buyouts (MBO) have increased dramatically over the last twenty years. In an MBO, senior managers take private a firm by purchasing its shares using funds borrowed by banks or other lenders. The change in corporate

ownership structure following the MBO is expected to enhance the firm's operating performance. This is due to two main factors: firstly, the increase in the equity holdings of managers increases the opportunity cost of shirking and of wasting firm's resources in useless expenses. Secondly, the larger concentration of shares owned by non-executive board members and other few main investors consent a closer monitoring of manager's behavior. In addition, the large liability derived from the debt incurred to finance the buyout forces mangers to increase future cash flows in order to be able to pay high interest expenses.

The empirical study conducted by Smith (1990) on 58 Management Buyouts (MBO) of publicly traded companies completed during 1977-1986 provided the evidence of the positive correlation between firm's performance and management ownership. The operating returns of the firms examined by Smith increased significantly from the year before the buyout and it remained at a higher level also during the subsequent years.

Moreover, the study of Smith (1990) also proved that the increase in operating income was not merely due to cuts to advertising expenses or research and development, but to reductions in operating costs and improvements of the working capital management. After the MBO firms were on average reducing the account receivable collection period and the holding period of inventories. Similar results are found in the studies of Kaplan (1989), and of Lichtenberg and Siegel (1990), which conclude that the increase in operating returns that follows MBOs is almost exclusively due to an increase in operating efficiency.

Chapter 3

METHODOLOGY

The following study has two main objectives: firstly, it will examine empirically the determinants of Mauritian firms' capital structure based on the capital structure theories presented in Chapter 2, and secondly it will be tested to which extent capital structure affects firm performance.

The sample used in this study consists of accounting data for 40 Mauritian firms[2] listed on the Stock Exchange of Mauritius (SEM) and grouped into 6 different sectors[3], namely:

- Banks, Insurance & Other Finance
- Commerce
- Industry
- Investment
- Transport, Leisure & Hotels
- Sugar

Panel data will be used for this study as it increases efficiency by combining time series and cross-section data. A panel of 40 listed firms over a 5-year time series is used. Here, a limitation is that data for 2007 has not been included since the 2007 financial statements figures might be restated in the following year.

[2] Accounting information for 2 firms are different from the remaining, hence they have been excluded from the sample in an attempt to be consistent as far as data is concerned.

[3] Initially, I decided to group the firms in 7 different sectors but since there is only one firm in the Transport Sector, I then decided to group Transport, Leisure & Hotels under the same heading. This is more appropriate as the data will be averaged for each sector.

The data were collected from different sources including audited accounts of the listed companies for the last five years from 2002 to 2006 as well as from the Handbook of the Stock Exchange of Mauritius published over the above-mentioned period. The Handbook provides reports of the income statement and balance sheet as well as other relevant statistics of all the Mauritian listed companies.

The research methodology and framework of my study has two main objectives:

1. To identify the Determinants of Capital Structure of Mauritian Firms
2. To determine the Optimal Debt Ratio for Mauritian Firms

In summary, a flow chart of the methodological process is illustrated below:

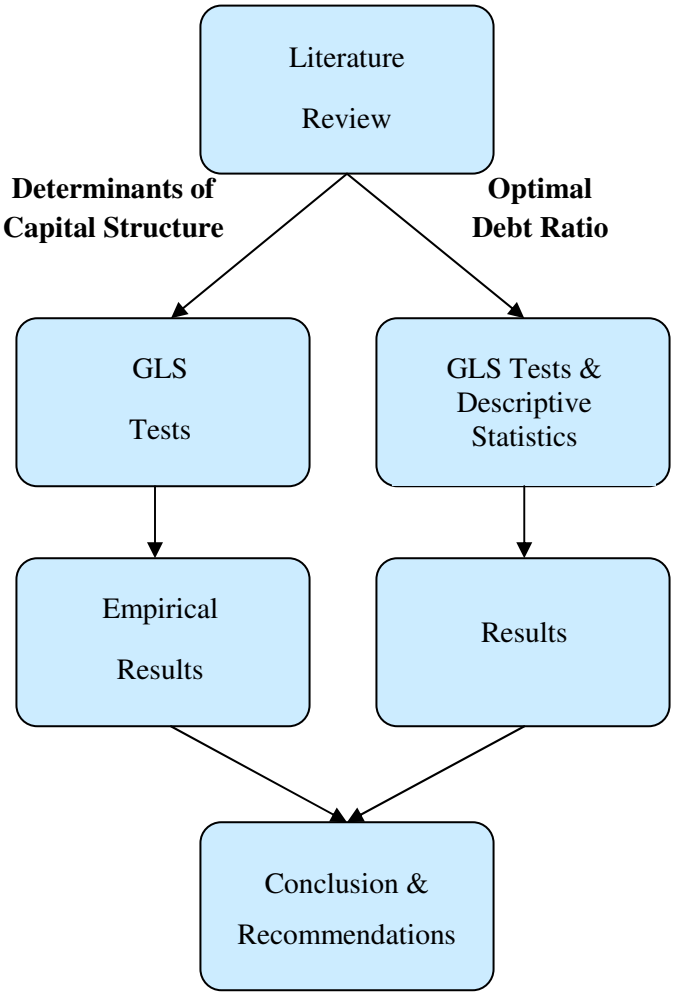

Figure 1

Chapter 4

THE DETERMINANTS OF FINANCING DECISION

The first econometric model presented in this study analyses the determinants of corporate financing decision of firms listed on the Stock Exchange of Mauritius (SEM). To explore the relationship between financial leverage and its determinants, I use a Generalised Least Squares Test (GLS) based on those determinants, which past literature deem to be the most effective in determining financial policy. I have used an econometric software package called STATA 6 Intercooled Edition to perform the GLS tests. STATA basically means 'Statistics and Data.'

The specification of the overall model follows closely the framework adopted by Damodaran (1996). However, the current study differs from Damodaran's in the fact that many of

the variables utilised are dissimilar. The choice of the variables, in fact, takes inspiration from Wiwattanakantang studies (1999). Nevertheless, while Wiwattanakantang investigated the determinants of capital structure for Thai firms, the present study is centered on Mauritian firms.

Hence, the first estimated equation has the following form:

$$MV = C_0 + C_1\,TAX + C_2\,INHOL + C_3\,PER + C_4\,TAN + C_5\,CAPEX + e_t$$

where:

MV= Debt/Market Value

TAX= Effective Tax Rate

INHOL= Insider Holding as Percentage of Total Shares Outstanding

PER= EBIT/Market Value

TAN= Fixed Assets/Total Assets

CAPEX= Annual Capital Spending/Book Value

C_0, C_1, C_2, C_3, C_4, and C_5 are estimated parameters.

e_t is the residual error term.

***Leverage* (MV)**

Market Leverage was used as the dependent variable for this study. Market leverage is obtained by dividing the cumulated value of debt by the cumulated value of debt plus the market value of equity. The cumulated value of debt includes bank loans and overdrafts, debentures, and other long term liabilities. On the other hand, the market value of equity is defined as the average share price[4] for each year multiplied by the number of outstanding shares. It is assumed that the book value of debt is equal to the market value of debt.

***Tax Rate* (TAX)**

Miller and Modigliani (1963) argue that the major benefit of using debt financing is corporate tax deduction. As a result, the higher the tax rate is the higher this benefit would be, and therefore, firms belonging to highly taxed industries are expected to be more leveraged than firms belonging to low taxed industries.

The present study utilise the effective tax rate, which is obtained by dividing the taxes paid by the taxable income as reported to the shareholders, as the proxy for tax. The marginal tax rate is generally considered a more effective proxy for studies on capital structure; however, the marginal tax rate of the firms analysed in this study was not available.

Insider Holding **(INHOL)**

The principal-agent theory argues that the interests of managers and shareholders are often in conflict and that due to information asymmetry managers are able to pursue their own interests rather than those of shareholders.

According to theory,the agency problem can be solved by increasing management ownership, because it would align the interests of managers and shareholders (Jensen and Meckling, 1976).

[4] The average share price has been calculated by averaging the daily share prices for each company for the period 2002 to 2006. This data was obtained from SBM Securities Ltd; a registered stock broking company.

As a consequence, firms mostly or partly owned by their managers do not need massive debt financing as a device to mitigate the principal-agent problem. This argument is further supported by the observation that individuals tend to be risk adverse: a large debt is less attractive to manager-owners than to managers who do not have a stake in the company because it imposes higher risks to the former than to the latter.

Hence, insider holding is deemed to be negatively related to financial leverage. For the purpose of this research, insider ownership is calculated as the number of shares held by insiders as a percentage of total stock outstanding. In line with the definition of the Securities and Exchange Commission (SEC), in this study the insiders include corporate officers, directors and whoever holding more than 5% of the outstanding stock.

***Tangibility* (TAN)**

As a general rule, lenders always prefer to lend money to companies with sizable fixed assets,

which can be used as collateral against the chance of inability of the debtor to repay the debt. Firms that cannot provide collateral to compensate the risk for financial distress have no choice but to pay a higher interest expense, since lenders may require higher lending rates. As a result, firms with low-valued fixed assets find debt financing more costly than equity financing, and thus they are expected to have a lower degree of leverage relative to their highly-valued fixed assets counterparts.

The present study uses fixed assets to book value as a proxy for tangibility. This is estimated by dividing the book value of fixed assets, which include the net value of property, plant and equipment as well as investments, by the total assets of the firm.

Capital Expenditures **(CAPEX)**

Jensen's free cash flow theory (1989) argues that the managers with large amounts of 'free-cash' available tend to invest more in projects, which can

be either profitable or unprofitable. Hence, the capital expenditure figure for firms with large amounts of 'freecash' is expected to be greater. Obviously, highly leveraged firms pay higher interest expenses, and thus, they have less money available to managers to invest. Therefore, according to Jensen's theory, firm's capital expenditures and the degree of leverage must be inversely related.

This study uses the cumulated capital spending reported in the statement of cash flow of the firm divided by the book value of capital, as the proxy for capital expenditure.

***Performance* (PER)**

The measurement of performance can be very subjective, and different studies on how capital structure influences performance have used different indicators: some studies have used Return on Assets (ROA), others Return on Investment (ROI), and some others Return on Equity (ROE)

(e.g. respectively Scherer and Ross 1990; Keats and Hitt 1988; and Oswald and Jahera 1991).

The present study, however, utilises Earnings Before Interests and Taxes (EBIT) to the Market Value of the firm as the proxy for company's performance[5]. EBIT was obtained from income statements of the listed firms while the Averaged Market Value for the sector was calculated multiplying the average share price for the year by the number of outstanding shares for the year.

Initially I decided to use Earnings Before Interests, Taxes Depreciation and Amortization (EBITDA), that is adding back Depreciation and Amortization to EBIT. However, I did not opt for this option since Capital Allowances (e.g Investment Allowance) changes over time and this directly impacts on Depreciation and Amortisation

[5] Ideally, Return on Investment (ROI) would have been a better variable to utilise. However, the given data did not provide this performance indicator, and thus I used EBIT/Market Value, which was the best performance indicator available, as the dependent variable of this model.

Chapter 5

EMPIRICAL RESULTS

To analyse the determinants of capital structure of Mauritian firms, I have decided to use a Generalised Least Squares (GLS) estimation method. I have performed a Hausman test to determine whether to use a Fixed Effect Model (FEM) or Random Effect Model (REM) before performing the GLS regression on the equation:

$$MV = C_0 + C_1\,TAX + C_2\,INHOL + C_3\,PER + C_4\,TAN + C_5\,CAPEX + e_t$$

The results obtained from Table 1 and Table 2 clearly shows that the Fixed Effect Model will not be an appropriate model to estimate the above equation. The results from Table 1 show that the FEM is inconsistent to be applied in this particular situation. Moreover, from Table 2, it can be observed that when using the FEM, all

the independent variables are insignificant. The value of R-squared (R-sq) is only 0.1898 thereby showing that only 18.98% of the capital structure of firms is being explained by the variables. The hausman test also supports that the use of the Random effect model is consistent.

Table 1

Hausman Test

	Coefficients	
mv	**(b)** **random**	**(B)** **Fixed**
tax	2.136025	0.885212
inhol	-0.8020768	-0.2206794
per	-0.2864047	0.2425236
tan	-0.176492	0.0650325
capex	-0.8757875	-0.3439054

Output by STATA 6 Intercooled Edition

Table 2

Generalised Least Squares estimation

(Fixed Effect Model)

mv	*Coef.*	*P values*
tax	0.885212	0.182
inhol	-0.220679	0.769
per	0.2425236	0.214
tan	0.0650325	0.840
capex	-0.3439054	0.131
_cons	24.41744	0.351

Output by STATA 6 Intercooled Edition

The Random effect model in Table 3, shows that only the effective tax rate (TAX) and capital expenditures (CAPEX) are significant while the other variable are all insignificant. However, the value of R-squared (R-sq) is 0.5207. This shows that the independent variables of the current model explain 52.07% of the capital structure of Mauritian firms.

Table 3

Generalised Least Squares estimation

(Random Effect Model)

mv	Coef.	P value
tax	2.136025	0.004
inhol	-0.8020768	0.045
per	-0.2864047	0.347
tan	-0.176492	0.519
capex	-0.8757875	0.002
_cons	53.28147	0.035

Output by STATA 6 Intercooled Edition

I have decided to carry out the GLS estimation (Random Effect Model) once again but this time with a Robust Variance. The robust variance will test for any serial correlation and heterocedasticity. This will make the data more consistent.

From Table 4, it can now be observed that the REM with robust variance has dealt with the abovementioned problems and the variables TAX (effective tax rate), INHOL (insider holding) and CAPEX (capital expenditures) are significant.

Table 4

Generalised Least Squares estimation

(Random Effect Model with Robust variance)

per	Coef.	P value
mv	-0.0557583	0.060
_cons	17.67182	0.005

Output by STATA 6 Intercooled Edition

The results, shown on table 4, are rather encouraging: the significance of the overall regression illustrates the existence of a relationship between capital structure and the determinants analysed. Apart from performance and tangibility, all the other determinants are significant to the model. The most interesting factor, however, is

given by the fact that all of the coefficients of the exogenous variables have the predicted sign.

More specifically, the negative sign of the coefficient of insider holdings shows that the higher the level of leverage the lower the percentage of shares held by insiders. This finding gives additional support to the principal-agent theory, which argues that a higher degree of leverage is needed to ensure that managers do shareholders interests. Nevertheless, when the managers are also the owner of the company they work for, managers and shareholders interests are already aligned, therefore, there is no need for increasing the degree of leverage as a mean to discipline managers.

The present study is in line with Miller and Modigliani (1963) where it was argued that the major benefit of using debt financing is corporate tax deduction. Thus, the higher the tax rate is the higher this benefit would be. Tax rate has a high significance in this model. This is explained by the positive sign of the coefficient of tax rate.

As expected, the coefficient of Capital Expenditure is negative: the high interest expense implied by high levels of leverage, leave highly leveraged firms with less money to invest in capital formation activities.

The empirical results presented by Lubatkin and Chatterjee (1994) provide evidence that shareholders can improve firm's efficiency and performance by increasing their debt to equity ratio. This, would be due to the fact that debt creation ensures that managers return excess cash flow to investors instead of investing it in projects with negative NPVs or wasting it in useless expenses. However, performance is an insignificant determinant in this model.

The coefficient of Tangibility usually shows that firms with valuable fixed assets can increase more easily their debt ratio relative to those firms with high intangible assets. This is due to the fact that fixed assets can be used as collateral for the liability that new debt issues imply. However,

tangibility is not a significant determinant in this model and therefore not relevant to this model.

The findings shows that tax rate, insider holdings and capital expenditures explain to a great extent the determinants of capital structure of Mauritian firms. Even though Mauritius is a developing country and the economic conditions and size of firms is not comparable to listed firms in the US or other major countries, the empirical results obtained are consistent with past literature

Chapter 6

THE OPTIMAL DEBT RATIO

In this section, GLS regressions is performed in order to test whether firms' economic performance is a function of the degree of leverage and if yes to which extent. The main objective of this analysis, however, is to find the optimal capital structure for Mauritian firms listed on the SEM, which is the level of leverage that balances the gains from high leverage – due to the tax deductibility of interest expenses and thus Earnings Per Share (EPS) is maximised – with the additional costs that high leverage imply, namely all the costs related to the increased risk of financial distress and bankruptcy. More specifically, the range within which the marginal benefits from leverage are equal to the marginal costs, and thus, firm's profits are maximized will be illustrated. The empirical analysis will be carried on as follows: firstly, I

perform an GLS test to the estimated equation $PER = C_0 + C_1 MV + e_t$, to investigate the nature and the extent of the relationship between financial leverage and performance, calculated as the ratio between firm's EBIT and its market value. Secondly, I will utilise descriptive statistics to analyse the pattern of the relationship between financial leverage and corporate performance, and finally, I will present the optimal range within which firms listed on the Stock Exchange of Mauritius (SEM) should have their debt range analysing the polynomial curve that better fits the scattered diagrams of leverage against performance. The second estimated equation to be tested has the form:

$$PER = C_0 + C_1 MV + e_t$$

where:

PER= EBIT/Market Value

MV= Debt/Market Value

C_0 and C_1 are estimated parameters.

e_t is the residual error term.

Chapter 7

RESULTS

The empirical results provide statistical evidence of the argument presented. From Table 5, the overall significance of the GLS test implies the existence of a relationship between financial leverage and firm performance for Mauritian firms. The coefficient of the variable MV (financial leverage) is positive. All of the diagnostic tests performed provide positive results, supporting further the output of the GLS regression. Nevertheless, the relatively low R-squared (R-sq), at 0.097, means that only 9.70% of the change in performance is explained by a change in the financial structure of the firm.

The main shortcoming of the GLS estimation is to be found in the fact that it depicts a linear relationship between the variables. Thus, it can be an ineffective tool to investigate variables

relationship when this is not linear. In this case a quadratic regression would be more appropriate.

The scattered diagrams presented in Figure 2 to Figure 6 (below), in fact, illustrates graphically that the relationship between financial structure and performance is much stronger than predicted by the simple GLS test, but that this is quadratic, and not linear. In practice, performance changes increase and decrease at changing rates for various values of financial leverage.

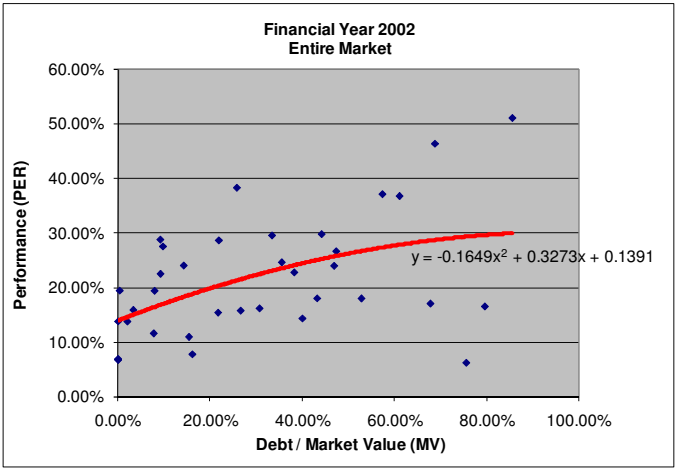

Figure 2

Figure 2 clearly shows that the relationship between financial leverage and firm performance is positive. At a higher level of leverage, the firm performance also tends to be higher.

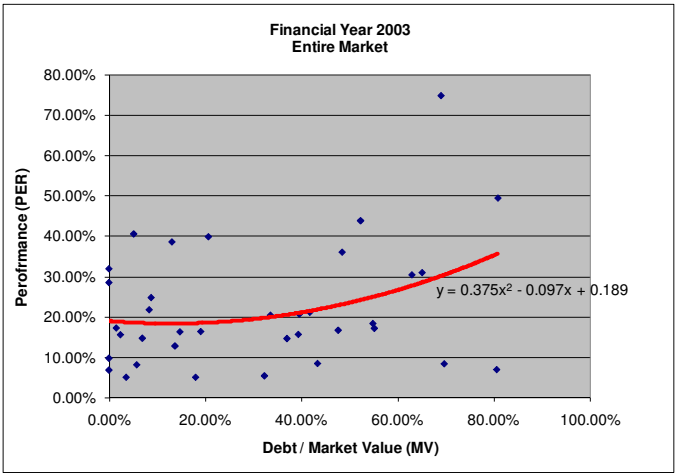

Figure 3

Figure 3 also depicts that a positive relationship exists. However, for a leverage of 0% to 20%, a negative relationship exists between the two variables.

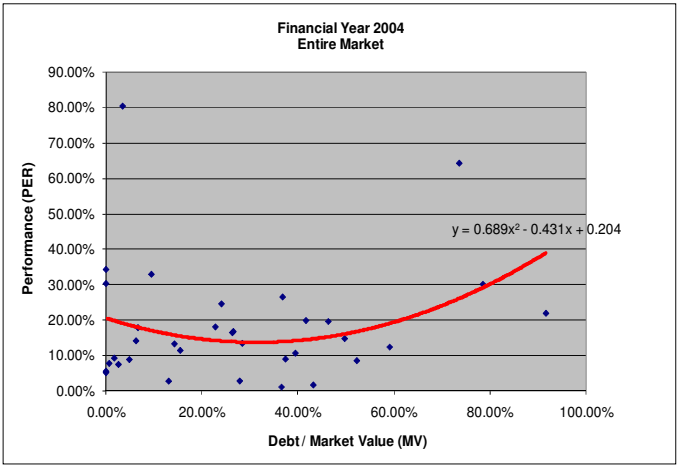

Figure 4

Figure 4 also depicts a positive relationship. But for the financial year 2004, it seems that there is an inverse relationship for a leverage level ranging between 0% and 30%.

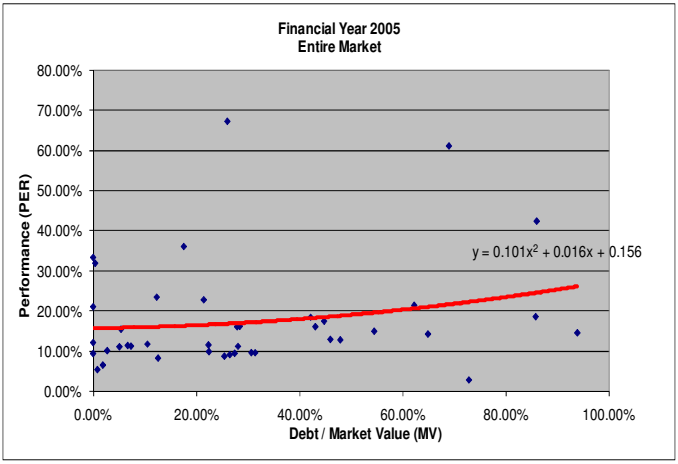

Figure 5

Figure 5 shows a positive relationship between financial leverage and firm performance. The higher the level of leverage, the higher is the performance.

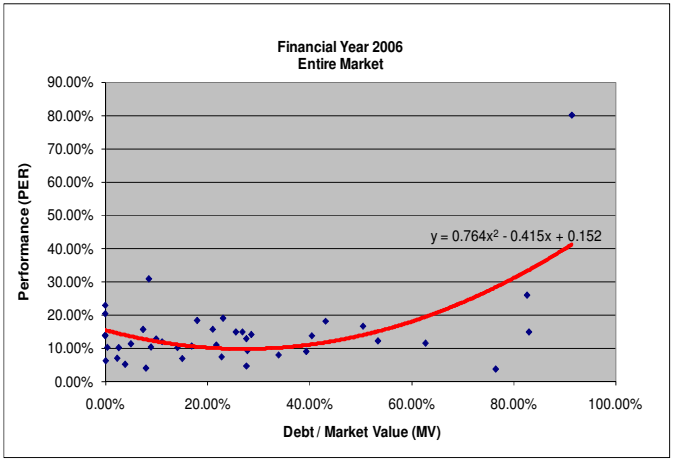

Figure 6

Figure 6 also shows a positive relationship. But for the financial year 2005, it seems that there is an inverse relationship for a leverage level ranging between 0% and 30%.

From Figure 2 to Figure 6, it can be observed that as financial leverage increases, the firm performance also increases for Mauritian firms. A limitation is that my study is conducted on 40 firms of the 42 listed on the Stock Exchange of Mauritius (SEM). If more companies were listed on the SEM (larger population size) more insights

could be obtained. However, the results are consistent with past literature.

Table 5

Generalised Least Squares estimation

(Random Effect Model)

per	Coef.	P value
Mv	-0.0557583	0.060
_cons	17.67182	0.005

Output by STATA 6 Intercooled Edition

The descriptive statistics presented in Table 6 provide additional support to the hypothesis of a quadratic relationship between financial leverage and firm performance: firms with a level of leverage in between 0 and 40 percent have an average return of about 15%, but it increases to almost 20% on average for firms with a level of leverage between 40 and 60 percent, this positive relationship between the two variables is also valid for levels of

leverage above 60 percent with an average return of 30%.

It could be argued that the optimal debt ratio would therefore lie between 70 to 80 percent but this is not the case due to the fact the standard deviation in return (EBIT/value), for firms having level of leverage above 60 percent, is too large for the whole period being analysed.

Hence, it is clear that the optimal debt ratio for Mauritian Firms lies somewhere around 50 percent as it can be observed from Table 3 with the standard deviation in return being very low for firms with a level of leverage in between 40 and 60 percent.

Even though the sample size is limited due to the small number of listed companies in Mauritius, I have been able to obtain the optimal debt ratio for Mauritian Firms. However, with a larger population size, I would have also been able

to show up to which point the relationship between financial leverage and firm performance is valid.

Table 6

Average firm performance for different levels of leverage: **low leveraged firms** (0%<Debt/BV≤40%), **medium leveraged firms** (40%<Debt/BV≤60%) and **high leveraged firms** (60%<Debt/BV≤100%)

	Low **0%< Debt/BV ≤40%**	Medium **40%< Debt/BV ≤60%**	High **60%< Debt/BV ≤100%**
Year 2002			
Debt to MV			
Mean	**15.35 %**	**50.31 %**	**75.29 %**
Standard Deviation	13.37 %	6.82 %	7.45 %
EBIT/Value			
Mean	**18.34 %**	**27.12 %**	**27.38 %**
Standard Deviation	8.41 %	7.91 %	19.94 %
Year 2003			
Debt to MV			
Mean	**14.07 %**	**49.09 %**	**71.40 %**
Standard Deviation	13.61 %	5.32 %	7.65 %
EBIT/Value			
Mean	**18.59 %**	**22.97 %**	**33.40 %**
Standard Deviation	10.94 %	12.36 %	25.79 %

Year 2004			
Debt to MV			
Mean	**16.93 %**	**48.65 %**	**77.92 %**
Standard Deviation	13.52 %	5.55 %	10.07 %
EBIT/Value			
Mean	**16.61 %**	**12.31 %**	**32.26 %**
Standard Deviation	15.07 %	6.70 %	20.97 %
Year 2005			
Debt to MV			
Mean	**14.35 %**	**46.42 %**	**75.39 %**
Standard Deviation	11.68 %	4.46 %	12.15 %
EBIT/Value			
Mean	**16.37 %**	**15.39 %**	**24.96 %**
Standard Deviation	12.84 %	2.32 %	19.90 %
Year 2006			
Debt to MV			
Mean	**14.36 %**	**46.95 %**	**79.33 %**
Standard Deviation	11.62 %	6.08 %	10.66 %
EBIT/Value			
Mean	**12.21 %**	**15.09 %**	**27.19 %**
Standard Deviation	5.71 %	2.70 %	30.65 %

In Table 7, the correlation matrix between debt to book value and firm's performance is illustrated. The table is constructed by dividing the

level of leverage into two main groups and assessing how the relationship between financial leverage and firm's performance changes for values of financial leverage. The two groups in which the Mauritian firms are divided are those with a low to medium degree of financial leverage, which is included between 0 to 60 percent, and those with a medium to high degree of financial leverage, which is included between 50 and 100 percent.

Table 7
CORRELATION MATRIX

	Debt to Book Value	**EBIT/Value**
Year 2002		
All Levels of Leverage		
Debt to Book Value	1	
EBIT/Value	**0.48**	1
Low to Medium leverage (0% to 60%)		
Debt to Book Value	1	
EBIT/Value	**0.51**	1
Medium to High Leverage (50% to 100%)		
Debt to Book Value	1	
EBIT/Value	**0.09**	1

Year 2003 All Levels of Leverage **Debt to Book Value** **EBIT/Value**	 1 **0.29**	 1
Low to Medium leverage (0% to 60%) **Debt to Book Value** **EBIT/Value**	 1 **0.11**	 1
Medium to High Leverage (50% to 100%) **Debt to Book Value** **EBIT/Value**	 1 **0.05**	 1
Year 2004 All Levels of Leverage **Debt to Book Value** **EBIT/Value**	 1 **0.12**	 1
Year 2004(continued) Low to Medium leverage (0% to 60%) **Debt to Book Value** **EBIT/Value**	 1 **-0.22**	 1
Medium to High Leverage (50% to 100%) **Debt to Book Value** **EBIT/Value**	 1 **0.32**	 1
Year 2005 All Levels of Leverage **Debt to Book Value** **EBIT/Value**	 1 **0.19**	 1
Low to Medium leverage (0% to 60%) **Debt to Book Value** **EBIT/Value**	 1 **-0.01**	 1

Medium to High Leverage (50% to 100%) **Debt to Book Value** **EBIT/Value**	1 **0.06**	1
Year 2006 All Levels of Leverage **Debt to Book Value** **EBIT/Value**	1 **0.41**	1
Low to Medium leverage (0% to 60%) **Debt to Book Value** **EBIT/Value**	1 **0.02**	1
Medium to High Leverage (50% to 100%) **Debt to Book Value** **EBIT/Value**	1 **0.57**	1

The correlation matrix shown on Table 7 illustrates how the direction of the correlation between level of leverage and performance changes with changes in the debt to book value ratio. More specifically, the two variables are positively correlated for medium to high leveraged firms, while, in some cases, they are negatively correlated for low to medium leveraged firms; more specifically in the range of 0 to 40 percent. Moreover, when all firms are taken together regardless of their level of leverage, the correlation

coefficients (at 48% in 2002, 29% in 2003, 12% in 2004, 19% in 2005 and 41% in 2006) are on average relatively low, showing that only the abovementioned percentages for each year of firm's performance is explained by its capital structure. In reality, however, the correlation coefficients calculated are not representative of both the nature and the direction of the correlation between the two variables.

The overall correlation, in fact, simply averages all the correlations at every level of leverage for each year. Nevertheless, in this specific case, the direction of the correlation between the two variables changes at different levels of leverages and it is stronger than originally calculated. When re-calculating the correlation between firm's performance and level of leverage, only for firms with a debt to book value ratio included between 50 and 100 percent, indeed, the correlation coefficient increases to a maximum of 57% for the period being analysed. At the same time, the correlation coefficient for firms with a

debt to book value ratio included between 0 and 60 percent increases to 51% only in 2002, but for the years 2003 to 2006 the correlation coefficients are near zero or negative, showing that the relationship exists but it is very weak (near zero) or an inverse relationship exists (negative)

Hence, the result shown on table 4 actually support the findings illustrated on figures 2 to 6, implying that the relationship between the two variables is not linear. In conclusion, the present analysis has provided evidence that firm's performance and its capital structure are correlated and that the optimal debt to market value ratio, for which firm's performance is maximised, is somewhere around 50% for Mauritian firms.

The analysis of the actual capital structure of Mauritian firms is perfectly consistent with the findings of the current research. Figure 7 below shows the percentage of Mauritian firms for each range of debt to market value ratio: most Mauritian firms listed on the SEM have a debt to market value ratio included between 0 and 40 percent (considered

as low leveraged firms), with very few firms at the upper end.

Most firms in Mauritius are reluctant to incur higher debt due to bankruptcy costs or may be due to lack of expertise and knowledge on how capital structure can lead to an increase in the firm performance. However the main reason for firms not to incur higher debt is to maintain an acceptable gearing ratio. It is important to note that the gearing ratio of these firms will impact on their credit rating. The credit ratings will in turn enable investors make investment decisions. Hence, in my opinion, these are the main reasons why most Mauritian firms prefer to have a considerably low level of debt between 0 to 40 percent as illustrated in Figure 7.

Only an average of 10 to 15 percent of the listed firms has their debt level near the value of what has been shown in this study to be the optimal debt ratio for Mauritian firms; that is around 50 percent.

Thus, those firms having their debt ratio around 50% have shown to yield much higher returns in contrast to low or high leveraged firms.

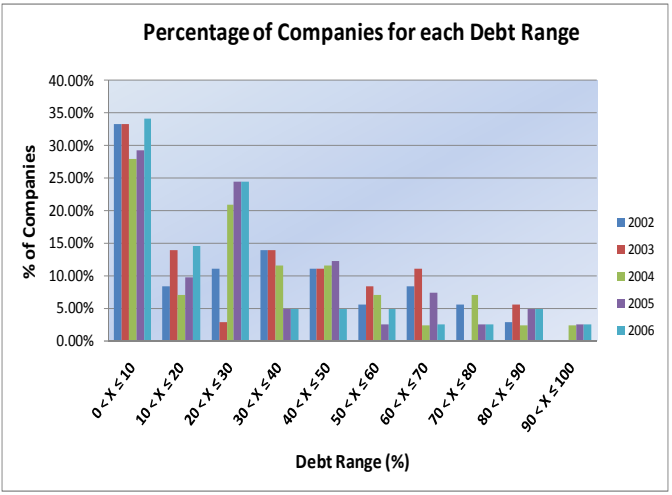

Figure 7

Chapter 8

CONCLUSIONS AND RECCOMENDATIONS

In the first econometric analysis presented in this research, I explored the determinants of capital structure using a sample of 40 Mauritian firms divided into 6 sectors. The empirical results provided further support to the main theories on capital structure developed during the last 50 years, namely that the agency costs, tax rate, capital expenditures and the ownership structure are determinant factors in financing decision.

The second econometric analysis investigated on the impact of capital structure on firm's performance, and the empirical results are consistent with past literature: below a certain range of leverage, firm's performance tends to be negatively related with the debt ratio. Nevertheless, above a certain range, the benefit from the tax

deductibility of interest expenses derived from an increase in the debt ratio will be more than offset by the increase in the costs related to financial distress and bankruptcy. However due to limited number of firms listed on the stock exchange, it was difficult to show up to which degree the relationship between firm performance and financial leverage is valid.

Hence, as a whole, the empirical results of this study have shown that the optimal debt ratio of Mauritian firms, which balances the tax deductions gains with the bankruptcy costs, is somewhere around 50%.

BIBLIOGRAPHY

Berle, A.A. and Means, G.C. (1932). The Modern Corporation and Private Property. The Macmillan Company, New York, NY.

Brickley, J. (1983). Shareholder wealth, information signalling and the specially designated dividends: An empirical study. *Journal of Financial Economics,* 12, pp. 187-210.

Brigham, E. and Gapenski, L. (1996). Financial Management. Dallas: he Dryden Press.

Denis, D. and Denis, D. (1993). Managerial discretion, organizational structure, and corporate performance. A study of leveraged recapitalizations. *Journal of Accounting and Economics,* 16, pp. 209-236.

Dolmat-Connell, J. Carrots and Sticks. *Forbes* (September 16th 2002), p.42.

Douma, S. and Schreuder, H. (1998). Economic Approaches to Organizations. 2nd ed. London: Prentice Hall.

Elliot, B. and Elliot, J (2002). *Financial Accounting and Reporting*. 7th ed. London: FT Prentice Hall

Harris, M. and Raviv, R. (1991). The theory of capital structure. *Journal of Finance*, 46 (1), 297-355.

Hart, O. (1995). Firms Contracts and Financial Structure. New York: Oxford University Press.

Hitt, M., Hoskisson, R. and Harrison, J. (1991). Strategic competitiveness in the 1990s: Challenges and opportunities for U.S. executives. *Academy of Management Executive,* 5(2), pp. 7-22.

Jensen, M. and Meckling, W. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure. *Journal of Financial Economics,* October, pp.305-360.

Jensen, M. and Ruback, R. (1983). The market for corporate control. *Journal of Financial Economics,* 11, pp. 5-50.

Jensen, M. (1986). Agency cost of free cash flow, corporate finance and takeovers. *American Economic Review Papers and Proceedings,* 76, pp. 323-329.

Jensen, M. (1989). Eclipse of public corporation. *Harvard Business Review,* 67(5), pp. 61-74.

Johnson, R. (1995). Issues and Readings in Managerial Finance. 4th ed. New York: The Dryden Press.

Keats, B. and Hitt, M. (1988). A casual model of linkages among environmental dimensions, macro organizational characteristics, and performance. *Academy of Management Journal,* 31, pp. 570-598.

Kaplan, S. (1989). The effects of management buyouts on operating performance and value. *Journal of Financial Economics,* 24, pp. 217-254.

Lambert, R. and Larcker, D. (1986). Executive Compensation, Corporate Decision Making, and Shareholders Wealth: A Review of the Evidence. *Midland Corporate Financial Journal*, Spring, pp. 64-71.

Lang, L., Stulz, R. and Walking, R. (1991). A test of the free cash flow hypothesis. *Journal of Financial Economics,* 29, pp. 315-335.

Lichtenberg, F. and Siegel, D. (1990). The effects of leveraged buyouts on productivity and related aspects of firm behaviour. *Journal of Financial Economics,* 27.

Lubatkin, M. and Chatterjee, S. (1994). Extending modern portfolio theory into the domain of corporate diversification: Does it apply?. *Academy of Management Journal,* 37, pp. 109-136.

McConnel, J. and Muscarella, C. (1985). Corporate capital expenditure decisions and the market value of firms. *Journal of Financial Economics,* 14, pp. 399-422.

Modigliani, F. and Miller, M. (1958). The cost of capital, corporation finance, and the theory of investment. *American economic Review* 48, June, 261-197.

Modigliani, F. and Miller, M. (1963). Corporate income taxes and the cost of capital: A correction. *American economic Review*, June, 433-443.

Oswald, S. and Jahera, J. (1991). The influence of ownership on performance: An empirical study. *Strategic Management Journal,* 12 (4), pp. 321-326.

Pinegar, M. and Wilbricht, L. (1989). What Managers Think of Capital Structure Theory: A Survey. *Financial Management,* Winter, pp. 82-91.

Scherer, F. and Ross (1990). Industrial Market Structure and Economic Performance (3rd ed.) Houghton Mifflin, Boston, MA.

Simerly, R. and Li, M. (2000). Environmental dynamism, capital structure and performance: a theoretical integration and an empirical test. *Strategic Management Journal,* 21, pp.31-49.

Smith, A. (1990). Corporate ownership structure and performance. The case of Management Buyouts. *Journal of Financial Economics*, 27, pp.143-164.

Vermaelen, T. (1981). Common stock repurchases and market signalling: An empirical study. *Journal of Financial Economics,* 9, pp. 139-183.

Wiwattanakantang, Y. (1999). An empirical study on the determinants of the capital structure of Thai firms. *Pacific-Basin Finance Journal,* 7, pp. 371-403.

ABOUT THE AUTHOR

Roshan Boodhoo is interested in researching a wide range of economic, finance and business-related topics. He is currently completing a Master of Arts in Finance and Investment at the University of Nottingham as well as an Executive Master of Business Administration at the Institute of Business Management Studies. He currently holds a Bachelor of Science in Banking and International Finance, a Bachelor of Business Administration in Finance and an Associate of Science in Finance.