

# **CAPITAL STRUCTURE: A VALUE-BASED MANAGEMENT FRAMEWORK IN THE HEALTHCARE SECTOR**

by

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## ABSTRACT

In this paper the author attempts to provide a management framework within which the top management can manage the capital structure to create and then optimize firm value. It was found that capital structure is dynamic rather than static and dependent on the industry and economic condition the firm is operating within.

A theoretical overview of the Modigliani and Miller (M&M) propositions, capital structure models and the most important factors determining an appropriate capital structure for a company are entertained. Empirical research has been done on the healthcare sector companies listed on the JSE for the period 2006 – 2010. Only six healthcare sector companies were listed on the JSE when this dissertation was started. A very small data pool was an unfortunate limitation of this study.

Capital structure determinants and Share price and Change in share price (representing sustainable value creation) have been statistically analysed to observe the relationship between capital structure and sustainable value creation.

The higher the amount of variables that can be included in the factor model, the higher the success rate of the factor model. Keeping that in mind, only two independent variables (NOPAT and Price/NAV) highly represented Share price and only one independent variable (D:E) represented the Change in share price for the years 2006 – 2010.

An interesting observation was that during 2007 – 2009 which includes the recession (Arieff et al., 2010; Davies, 2012) NOPAT and P:E were highly representative of Share price and D:E and EVA were highly representative of Change in share price. Due to the Change in Share price being more representative than the Share price it was concluded that especially during times of economic downturn sustainable value could be created by managing the Change in share price well. A negative change in share price will obviously reflect negatively on value creation and will decrease the firm value. D:E ratio and EVA within the ranges as applicable for the specific industry in which the company is operating should be used as a guide to manage the Change in share price well. Thinking about it, it makes good sense to manage your D:E ratio well during economic trying times because

as recently experienced in South Africa and actually world wide; it is usually the companies with the greater debt that suffer because they are unable to honor their debt commitments. EVA can be seen as a good measure of performance as part of a Value Based Management system especially during times of economic downturn due to being an indication of the residual income created. Having residual income and savings during financially difficult times is like having a life jacket in the middle of a sea storm.

Companies in the healthcare sector have many ethical and legal considerations that are special to the industry and possibly complicate the industry but should be used as leverage to compete more intelligently in the industry. Companies in the healthcare industry in South Africa should be encouraged to get listed on the JSE. More information would then be available for further research and the company can benefit due to having more capital available for larger projects and expansions (within their target D:E range). The results of the further research might then be more reliable due to a larger, more representative data pool.

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## LIST OF ABBREVIATIONS

BV/S	Book value per share
BY+P	Bond yield plus risk premium
CAPM	Capital asset pricing model
CF int cov	Cash flow interest cover
CF/S	Cash flow per share
COS	Cost of sales
CR	Capital requirements
D	Long term debt
D:E	Debt to equity ratio
DCF	Discounted cash flow
E	Equity
EBIT	Earnings before interest and taxes
EMRP	Equity market risk premium
EROIC	Expected return on invested capital
EVA	Economic value added
FCF	Free cash flow
g	Growth rate
JSE	Johannesburg Stock Exchange
M&M	Modigliani and Miller
MVA	Market value added
NAV	Net asset value
NOI	Net operating income
NOPAT	Net operating profit after taxes
NPV	Net present value
OP	Operating profitability
P:E	Price per earnings
Price/BV	Price per book value
Price/CF	Price per cash flow
Price/NAV	Price per net asset value
PV	Present value
ROA	Return on assets
ROE	Return on equity
ROIC	Return on invested capital
$r_u$	Required return for the unlevered company
SEP	Single exit price
$T_c$	Marginal tax rate
VBM	Value based management
$V_L$	Value of the levered company
$V_U$	Value of the unlevered company
WACC	Weighted average cost of capital

## DEFINITION OF KEY TERMS

**ARBITRAGE** can be interpreted as buying and then immediately selling the same asset at different prices to earn a risk-free profit like for example with forex trading.

**NOI** is the Net Operating Income which represents the operating income after operating expenses are deducted, but before income taxes and interest are deducted.

**MARGINAL TAX RATE** is the amount of tax paid on an additional dollar/rand of income. This implies that as income increases, the tax rate will also increase.

**SINGLE EXIT PRICE** refers to the fact that pharmaceutical companies, mandated by law, may only sell their products at one price to all their customers. This disregards the nature of the order size and the consumption levels. Put differently, each and every product and its variants 'exits' the factory at one single price for that product or variant.

# CHAPTER 1

## CAPITAL STRUCTURE: A VALUE-BASED MANAGEMENT FRAMEWORK IN THE HEALTHCARE SECTOR

*"... real value creation builds stronger companies, economies, and societies."*

- *Tim Koller (2010)*

### 1.1 INTRODUCTION

Does your publicly trading company need to expand its operations? The easy part is realising that you should expand. The difficult part is to decide on how to finance the expansion in such a way that the decision will increase shareholder wealth.

The question arises: should the required money be borrowed (debt) or should more shares be issued (equity) to raise the necessary funds?

The mix of equity and debt to finance the company's operations is known as the capital structure (Myers, 2001:81).

Generally the financing decision should attempt to achieve the primary aim of a publicly listed company, namely to maximise the wealth of the shareholders (Megginson *et al.*, 2010:16-17). The wealth created should be sustainable to ensure longevity of the company. Wealth is measured by the share price (Megginson *et al.*, 2010:17) and the share price is basically a reflection of the investors' sentiment towards the cash flows of the company (Megginson *et al.*, 2010:17; Jones, 2005).

The growing popularity of the shareholder wealth culture is a relatively new concept known as Value Based Management (VBM). VBM developed over the past 30 years and started in the United States spreading to Europe, Latin America and Asia (Young & O'Byrne, 2001:5).

The shareholder wealth culture was initiated largely due to the following major developments (Young & O'Byrne, 2001:6):

- 1) Globalisation and the deregulation of capital markets.
- 2) No more capital and exchange controls.

- 3) Information technology advances.
- 4) Securities markets becoming more volatile.
- 5) Capital market up-regulation.
- 6) Attitudes toward savings and investments changed with the coming of a new generation; and
- 7) Institutional investment expansion.

According to Young and O'Byrne (2001:18) a fully integrated VBM program should probably include the following:

- 1) Strategic planning.
- 2) Capital allocation.
- 3) Operating budgets.
- 4) Performance measurement.
- 5) Management compensation.
- 6) Internal communication; and
- 7) External communication with the capital markets.

Young and O'Byrne (2001:18) remind of the fact that Economic Value Added (EVA) and VBM are totally different concepts therefore the concepts should not be used interchangeably or as substitutes, and for a good reason. Considering the seven points above necessary within an integrated VBM program it is argued that EVA represents only one sub-part of the VBM process. EVA, it is concluded, would resort under point 4 above, since it focuses on the economic profit (residual income) earned as a measurement of wealth. Based on the above it seems correct that EVA and VBM should not be used interchangeably or treated as the same concept.

De Wet and Hall (2004:39) define EVA as the organisation's ability to earn returns above the cost of capital and Young and O'Byrne (2001:5) similarly define EVA as the difference between the return on a company's capital and the cost of that capital.

De Wet and Hall (2004:39) also acknowledge the role that EVA plays in maximising the firm's value for the shareholders because they state that EVA (and not the commonly believed Market Value Added (MVA) should be maximised in the value creation process.

De Wet and Hall (2004:41) conclude that the aim should be at maximising EVA rather than MVA because EVA is an internal measure of performance that drives MVA. MVA is, from an investor's point of view, the ultimate final measure of a company's performance. MVA in this context is defined as the present value of all future EVA to be generated by the company.

From another point of view wealth is created by applying financial leverage, employing debt in the company's capital structure. Financial leverage is referred to as "gearing" in Britain according to Megginson *et al.* (2010:413). A firm's financial performance, positive and unfortunately negative as well, can be magnified via the leveraging effect (Megginson *et al.*, 2010:413).

As a second important issue surrounding financial leverage, it should be kept in mind that adding debt to the capital structure raises the cost of capital of the remaining equity (because levered equity is more risky, the investors will require a higher return on investment in the firm) (Megginson *et al.*, 2010:421).

Return on investment for the investor must exceed expectations to increase shareholder's wealth. The company's share price will fall if the required return on investment is not earned and the price reduction will be due to negative investor sentiment (Bughin & Copeland, 1997:159).

The company's optimal or target capital structure would depend on a trade-off between the benefits of debt (like for example the tax shields) and the costs of debt (like for example bankruptcy costs and agency costs). The trade-off model, as proposed by Jensen and Meckling in 1976, has several specific implications:

- 1) The profitable firms should be having more debt due to an increased benefit from debt tax shields.
- 2) The firms that have tangible, marketable assets should be borrowing more.
- 3) The "safer" firms should be having more debt than riskier firms; and
- 4) All companies should have a target capital structure.

A great deal of evidence support these implications of the trade-off model but one certain inconsistency is that profitable companies tend to have less debt, rather than more debt as the model predicts (Megginson *et al.*, 2010:451). This is explained by the pecking

order theory that was proposed by Stewart Myers in 1984 and will be discussed in more detail in chapter 2.

The objective of every firm that aims to optimise its capital structure will be to minimise the cost of capital and/or maximise the firm's value (Cohen, 2004:89). From this statement then the logic follows that a relationship should exist between the optimal capital structure and maximising a company's value. Normally the optimal capital structure will be where cost of capital, in this case Weighted Average Cost of Capital (WACC), is at its lowest.

Tim Koller, a partner of McKinsey and Company in New York (Koller, 2010) feels that although the cost of capital is an important driver of value, the particular company's cost of capital is mainly determined by the industry it functions in, and that therefore the company itself can only influence its cost of capital in a minor way by adjusting its capital structure. The author concludes that although the capital structure is important it is not a management lever for value creation.

In the same line of thought, Franco Modigliani and Merton Miller introduced the basics on capital structure (Modigliani & Miller, 1958) when they published their well known article, *The cost of capital, corporate finance and the theory of investment*. Their work contained in the article remains the basis for today's arguments about capital structure and corporate financing. The Modigliani and Miller (M&M) theory or the capital structure irrelevance principle, basically states that "... in the absence of taxes, bankruptcy costs, and asymmetric information, and in an efficient market, the value of a firm is unaffected by how that firm is financed" (Modigliani, 2008).

As stated the M&M theory was initially proven under the assumption of **no taxes**, but it is known to be extendable to situations where taxes are applicable. Under the M&M theorem the value of a levered and unlevered firm (all else equal) is the same.

Modigliani and Miller objected to the generally accepted view according to which a corporation can reduce its cost of capital by determining the optimal debt to equity ratio. According to Modigliani and Miller managers should first and foremost seek to minimise tax liability and maximise corporate net wealth independent of the debt to equity ratio (Modigliani, 2008).

Shareholders are sometimes called residual claimants because they can only earn a return on invested capital after all other stakeholders' claims have been met. Thus by optimising shareholder wealth it goes without saying that customers, employees, suppliers, creditors and other stakeholders' "needs" would have been met already. Secondly, it should be clear that only shareholders have the proper incentives to make risky, value maximising investments (Megginson *et al.*, 2010:17).

## **1.2 PROBLEM STATEMENT**

Heightened pressure on firms to focus on maximising shareholder value was brought on by an increase in competition in the managerial labour and capital markets and has led to a search for ways to manage shareholder value (Ryan & Trahan, 1999:46).

Considering the trade-off capital structure theory (which attempts to address the shortcomings of the M&M theory), the M&M theory itself and other approaches to capital structure management, it is not clear whether capital structure management has a definite impact on wealth creation. As such it is not clear whether or how capital structure management should be incorporated in a VBM program with the aim to optimise value.

## **1.3 RESEARCH OBJECTIVES**

The research objectives are divided into primary and secondary objectives.

### **1.3.1 Primary objective**

The primary objective of the study is to determine whether a management framework can be developed to manage capital structure for optimal value creation for companies listed under the healthcare sector as listed on the JSE (Johannesburg Stock Exchange).

### **1.3.2 Secondary objectives**

The specific secondary objectives of this research are:

- 1) To determine whether a linear relationship exists between sustainable value creation and optimal capital structure.

- 2) To establish what the range of an optimal capital structure would be for a company in the healthcare sector.
- 3) To determine to what extent an optimal capital structure contributes to building sustainable value (determining whether it is a significant contribution). Sustainable value creation will be measured by measuring Share price and Change in share price.

## **1.4 RESEARCH METHOD**

This research, pertaining to the specific objectives, consists of three subsections, namely:

### **1.4.1 Research design**

A complete theoretical review is given regarding capital structure in general and capital structure in the healthcare super sector. The sources that are consulted include:

- 1) Journal and magazine articles.
- 2) Text books.
- 3) Internet websites.

The empirical study consists of the research design, participants and statistical analysis. This is research done in the Financial Management module in the area of Capital structure and specifically how the optimal capital structure can contribute to building sustainable value and maximise shareholder wealth.

A quantitative research approach will be maintained with historical financial data that will be analysed. The appropriate historical financial data that is standardised will be obtained from the McGregor BFA database and the JSE database (secondary data). Data from 2006 to 2010 will be included in this research. The year 2006 was chosen as the start of data collection due to the fact that it was the year that changes in the wholesale medicine pricing was introduced. The South African government attempted to control medicine prices and this fact could have an effect on the free cash flow (FCF) and value creation of the pharmaceutical suppliers (FMF, 2006).

Change in share price and Share price [dependent variables] will be representing the sustainable shareholder wealth and will be put against the following independent

variables: Net operating profit after tax (NOPAT), Earnings before interest and taxes (EBIT), Cost of sales (COS), Weighted average cost of capital (WACC), Return on equity (ROE), Return on assets (ROA), Debt to equity ratio (D:E), Return on invested capital (ROIC), Book value per share (BV/S), Cash flow per share (CF/S), Cash flow interest cover (CF int cov), Price per book value (Price/BV), Price per cash flow (Price/CF), Price per earnings (P:E), Price per net asset value (Price/NAV), Economic value added (EVA) and Free cash flow (FCF).

#### **1.4.2 Research sample**

The sector of the JSE that will be used in this research is the healthcare super sector which entails the entire healthcare industry listed as at February 2011. This particular industry and super sector includes the pharmaceutical and biotechnology sector and the healthcare equipment and services sector. As at February 2011, only four companies were listed under the pharmaceutical and biotechnology sector and therefore all four of these companies are included in this research. The four companies by name are Adcock Ingram Holdings Ltd. (Adcock), Aspen Pharmacare Holdings Ltd. (Aspen), Cipla Medpro SA Ltd. (Ciplamed) and Imuniti Holdings Ltd. (Imuniti). Only two companies were listed under the healthcare equipment and services sector, namely Mediclinic and Netcare and thus both will be included in the research as well. A total number of six companies will therefore be included in the research.

#### **1.4.3 Statistical Analysis**

The aforementioned data will be statistically analysed by looking for correlations within years and doing stepwise forward regression as the data is too little to meaningfully do and accurately interpret multiple regressions. The lack of some data points in the information used and the fact that so few companies are listed on the JSE under the healthcare super sector would prove to be quite a significant setback during the statistical analysis. Correlations between the dependent research variables Change in share price and Share price with the independent variables (as mentioned in paragraph 1.4.1) for capital structure will be determined to establish the relationship between the mentioned variables. The most applicable (highest correlated) variables which relate to capital structure and the maximum value of the companies are to be identified so that the highest correlated independent variables can be used to predict high firm values.

## **1.5 LIMITATIONS**

The first limitation is that the JSE listed healthcare industry comprised only of six companies as at February 2011. The second limitation is that only five years' data is used. Thirdly, although only five years' data are taken into consideration, not all the necessary data for the six companies were available for the five years under consideration. The financial data that will be used will be standardised according to the McGregor criteria. This standardisation has a dual purpose; it can be a limitation but also a benefit. Standardisation can be seen as a limitation for smaller companies which may not keep adequate records and will lead to gaps in the data which could result in the results of the standardisation calculations reflecting negatively on the particular company. The standardisation can be regarded as a benefit when it allows data to be compared which otherwise would have been impossible.

## **1.6 EXPOSITION OF CHAPTERS**

The chapters in this mini-dissertation are presented as follows:

Chapter 1: Introduction and problem statement.

Chapter 2: Literature review of capital structure in general

Chapter 3: The research methodology of this investigation and some company specific information of the healthcare industry companies listed on the JSE.

Chapter 4: Conclusions and recommendations.

## CHAPTER 2

### CAPITAL STRUCTURE THEORY

#### 2.1 INTRODUCTION

This chapter is written with the intention to describe the existing theories regarding capital structure and value optimisation in order to create sustainable value. Working through these theories is an essential part of the process to determine which factors dictate a company's capital structure. Understanding why a company's capital structure is important and how the capital structure can add to creating sustainable shareholder wealth is important in the realm of corporate finance.

Remembering that capital structure refers to how the company's activities are financed; i.e. the proportion of debt to equity, it is clear that a measure is needed to guide the company regarding the management of the debt to equity proportion.

The D:E) ratio is the measure that is applied in the management of the debt to equity proportions.

$$D \div E = \text{Long-term debt} \div \text{Stockholder's equity} \quad (\text{Eq. 2.1})$$

Please note that the D:E ratio uses the book value of debt and equity and not the market values.

The D:E ratio needs to be managed to have a value of preferably less than one (the smaller the number the less the total long-term debt compared to the total equity) (Flynn, 2003:185). It should also be noted that the trend of the ratio is important and should be evaluated in conjunction with the actual ratio value.

Myers (2001:83) reminds that in general the D:E ratio would be low or even negative when profitability and business risk are high or when dealing with a prominent growth company. Also keep in mind that, per implication, the D:E ratio would be dictated to some extent by the industry that the company is operating within (Koller, 2010).

In practice, firms do not manage capital structure according to an exact number but rather aim for a target capital structure (Brigham & Ehrhardt, 2002:620). The target is dynamic

and corresponds to changing conditions. Capital structure policy evolves around a trade off between risk and return. Incorporating more debt into the capital structure raises the risk borne by stockholders and therefore the expected rate of return on equity (ROE). Higher risk due to a greater portion of debt being used in the capital structure leads to a lower share price while the higher expected ROE raises the share price again (Brigham & Ehrhardt, 2002:620). From this it is clear that risk and return should be balanced so that the share price can be maximized.

Previous research that is relevant to this study will be included in this chapter.

The Modigliani and Miller (M&M) propositions are the basis of capital structure theory. The M&M propositions (without and with taxes) will be introduced followed by the other well-known theories: the trade-off model, the pecking order hypothesis and the signaling hypothesis. Principal factors to consider during capital structure decisions will be discussed. Despite common belief the ultimate goal of any company is to optimise shareholder wealth while minimising the cost of capital.

Nel (2010) mentions that the current evidence on capital structure indicates the following:

- 1) Companies with high growth borrow less than mature companies do.
- 2) Companies' strategies relating to their products and markets and also their asset bases influence their capital structure decisions.
- 3) The more profitable firms tend to use less leverage.
- 4) The capital markets receive leverage-increasing events positively.
- 5) The fact that interest is tax deductible serves as an incentive to companies to use debt.

The value of a company is determined by the present value of expected future free cash flow. The following basic equation is the scientific expression of the value of a company (Brigham & Ehrhardt, 2002:465):

$$V = \sum_{t=1}^{\infty} \frac{FCF^t}{(1+WACC)^t} \quad (\text{Eq. 2.2})$$

Where:

- $V$  = The value of operations which is the firm's value as a going concern.  
 $\sum_{t=1}^{\infty}$  = The sum of all future values from the first year of operation.  
 $FCF^t$  = Value of the free cash flow for the specific year/period.  
 $(1 + WACC)^t$  = Factor used to discount future free cash flow value to the present value for the specific year/period.

Where:

$$WACC = w_d (1-T) r_d + w_e r_s \quad (\text{Eq. 2.3})$$

Where:

- $w_d$  = The weights of long-term debt.  
 $T$  = The firm's marginal income tax rate.  
 $r_d$  = The expected cost of long-term debt.  
 $w_e$  = The weight of the total equity.  
 $r_s$  = The expected cost of common stock.

WACC will be discussed in more detail in paragraph 2.7.4.

The above equations show how the capital structure influences the company value by being used as the factor by which the future free cash flows are being discounted.

## 2.2 CAPITAL STRUCTURE THEORY

The strategy that is used to incorporate debt in to the company's capital structure is formed according to certain theories.

The different theories comprising of the mainline theories and the conditional theories will be discussed in detail.

### 2.2.1 The Modigliani and Miller (M&M) propositions

Corporate financing can not be studied without taking note of the propositions of Franco Modigliani and Merton Miller (M&M) that drafted the most influential articles amongst financial papers ever published. They were the first researchers that addressed capital

structure in a rigorous, scientific fashion and paved the way for further research (Brigham & Ehrhardt, 2002:663). They pointed out that financing did not fundamentally affect firm value (Megginson *et al.*, 2010:417). According to M&M the debt and equity mix merely translated to an altered division of cash flow between the stockholders and bond holders.

M&M's conclusion that financing did not affect firm value was based on certain assumptions (Megginson *et al.*, 2010:418):

- 1) Capital markets are perfect. No frictions like taxes or transaction costs exist.
- 2) Investors and firms can borrow and lend at the same rate.
- 3) No information asymmetries exist.

Despite the fact that the above conditions do not exist in the real world, M&M's conclusion stay significant for two reasons (Megginson *et al.*, 2010:418):

- 1) Through grasping the reasons why leverage choices have no value impact on firms, managers gain understanding of the reasons why one capital structure is preferred over another.
- 2) The M&M conclusion is based on the principle of arbitrage (i.e. buying and immediately selling the same asset at different prices to earn a risk free profit). This same principle is still very relevant today and drives many important concepts in finance like for example the determination of exchange rates. M&M proved their proposition by using a no-arbitrage argument.

## **2.2.2 M&M without taxes**

### *2.2.2.1 M&M Proposition I*

This was the first model that proved that capital structure decisions may be irrelevant and is commonly known as the "Capital Structure Irrelevance Proposition" (Megginson *et al.*, 2010: 418; Modigliani, 2008). Modigliani and Miller assumed perfect market conditions and therefore no taxes (as explained above).

The market value of a levered company (using debt as part of the capital structure) is essentially the same as for an unlevered company (equity only capital structure) (Brigham & Ehrhardt, 2002:664).

**Table 2.1** Comparison of the unlevered and levered firms under perfect market conditions.

	Unlevered	Levered
Net operating income (NOI)	100,000	100,000
<u>Less:</u> Interest payment (0.06 x D)	0	-30,000
Net income [NOI - (0.06 x D)]	100,000	70,000
Required return on assets (rA)	0.10	0.10
<b>Total firm value (NOI ÷ rA)</b>	<b>1,000,000</b>	<b>1,000,000</b>
Required return on equity (rU or rL)	0.10	0.14
Shares outstanding	20,000	10,000
Market value of the equity (E)	1,000,000	500,000
Interest rate on debt (rd)	N/A	0.06
Market value of debt (D)	0	500,000

Source: *Megginson et al., 2010:419.*

Table 2.1 illustrates that a levered company's market value is the same as for an unlevered company when M&M Proposition I holds (without taxes). This is true because the NOI is used to calculate the market value and not the Net income. Because the unlevered company has no debt, the required return on its equity ( $r_U$ ) equals the required return on its assets where for the levered company the required return on equity will be higher to compensate the investor for bearing the risk of investing in a levered company (Megginson *et al.*, 2010:419). This is another important insight of the M&M proposition: although debt is less costly for companies to issue than equity, the issuing of debt causes the required return on the remaining equity to rise (Megginson *et al.*, 2010:421). (Assume an interest rate on debt of 14% and required return on assets of 10% with R50 per share price).

Thus (Brigham & Ehrhardt, 2002:664):

$$V_L = V_U \quad (\text{Eq. 2.4})$$

Where:

$V_L$  = Value of a levered company.

$V_U$  = Value of an unlevered company.

In mathematical format the above equation can also be expressed as (Megginson *et al.*, 2010:418):

$$\begin{aligned} V &= (E + D) && \text{(Eq.2.5)} \\ &= (\text{NOI} \div r_U) \end{aligned}$$

Where:

E = Market value of total equity.

= Number of shares outstanding × Share price.

D = Total market value of outstanding long-term debt.

NOI = Operating income after operating expenses is deducted, but before income taxes and interest is deducted (Seen as cash-flow here).

$r_U$  = Required return of the unlevered company (equal to the required return on assets).

This is the compensation paid to the investor for taking the risk of buying shares in the particular company.

The model of Equation 2.5 is well known as the M&M Proposition I. The M&M Proposition I states that V (company value) is a constant, regardless of the proportions of debt and equity (D and E), provided that the assets and growth opportunities on the balance sheet are kept constant.

In addition to the above, Proposition I also declares that each firm's cost of capital is a constant, regardless of the applicable debt ratio (Myers, 2001:93). This statement will be discussed further in 2.2.2.2 (the next section).

From the foregone it is then concluded that financial leverage is irrelevant. This means that the value of the unlevered firm is the same as the value of the levered firm or differently put; "a firm's market value is not related to its D:E ratio" (Megginson *et al.*, 2010:421; Modigliani & Miller, 1958: 269).

#### 2.2.2.2 M&M Proposition II

This proposition states that the expected return on a levered firm's equity  $r_L$  (cost of equity) increases with the D:E ratio (leverage) (Megginson *et al.*, 2010:421):

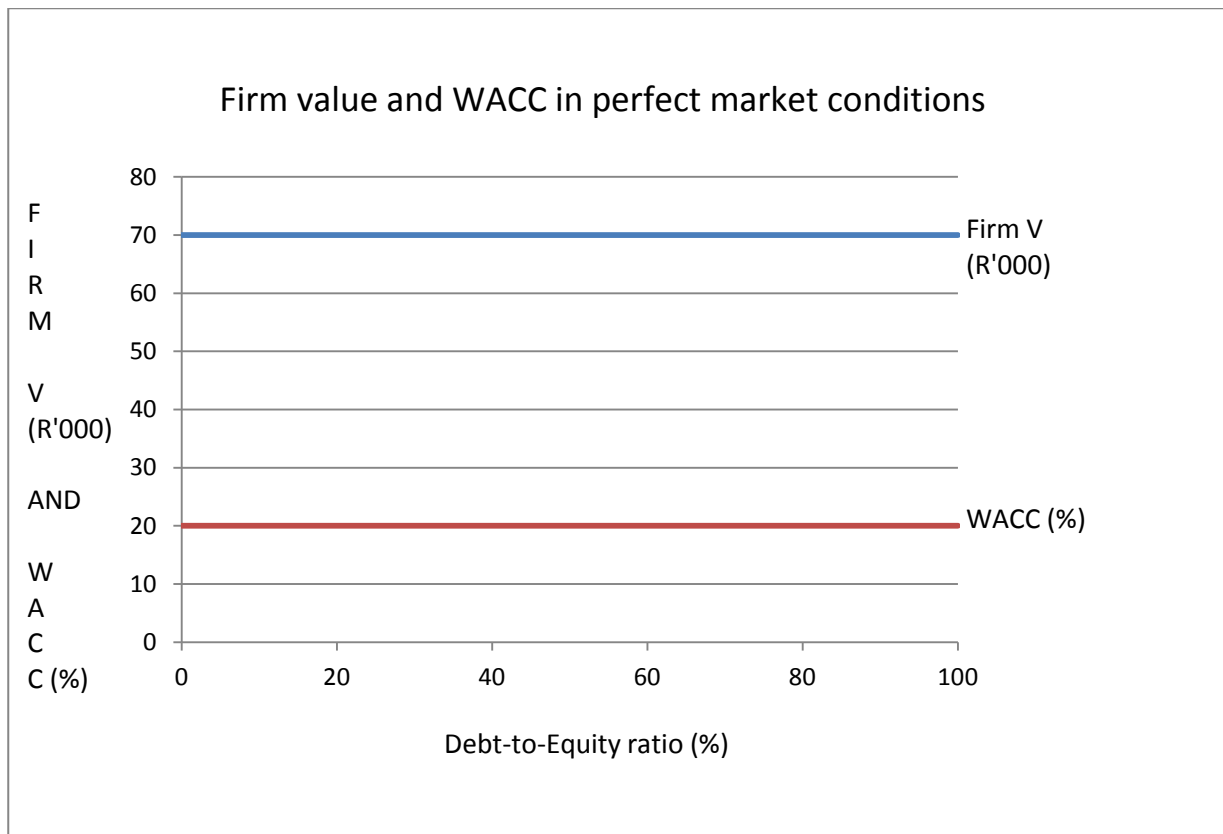
$$r_L = r_A + (r_A - r_d)\left[\frac{D}{E}\right] \quad (\text{Eq. 2.6})$$

Where:

- $r_L$  = Expected return on a levered firm's equity.
- $r_A$  = Required return on the firm's assets.
- $r_d$  = Cost of debt (interest).
- $D$  = Market value of outstanding debt.
- $E$  = Market value of outstanding shares.

Equation 2.6 would then prove that for an unlevered firm, the return on equity equals the return on assets. However, should the unlevered firm incorporate debt into its capital structure moving away from an unlevered structure to a levered structure, the return (cost) of equity will also rise (Megginson *et al.*, 2010:421). Substituting equity capital with "cheaper" debt capital results in no net benefit in lowering the total cost of capital, because of the increase in rate of return of the firm's remaining equity that exactly offsets the savings of substituting the proportion of equity with debt. This conclusion relates back to Proposition I. Thus, substituting debt for equity (or vice versa) should have no net impact on the company's financing costs (cost of capital).

Referring back to the previous section, it was mentioned that Proposition I also declares that each firm's cost of capital is a constant, regardless of the applicable debt ratio (Myers, 2001:93). This statement is now proven in the above paragraph and graphically illustrated in Figure 2.1. This declaration can be interpreted as that the market value of a firm is independent of its capital structure. Consequently, the firm's weighted average cost of capital is also independent of its capital structure. The WACC for the firm, regardless of the amount of debt it uses, is equal to the cost of equity it would have if it used no debt (Brigham & Ehrhardt, 2002:664). It is known from section 2.2.2.1 that the cost of equity is equal to the required return on assets for an unlevered company, thus for an unlevered company the WACC will equal the required return on assets. Prasad *et al.* (2001:8) state that the current leverage of a firm is as good as any other.



**Figure 2.1** The effect of leverage on firm value and cost of capital in perfect market conditions.

Source: (Megginson *et al.*, 2010:430).

Equation 2.7 can now be re-written as follows (Megginson *et al.*, 2010:422):

$$r_A = [D \div (D + E)] r_d + [E \div (D + E)] r_L \quad (\text{Eq. 2.7})$$

Where:

- D = Market value of outstanding debt.
- E = Market value of outstanding shares.
- $r_A$  = Required return on the firm's assets.
- $r_d$  = Cost of debt (interest).
- $r_L$  = Expected return on a levered firm's equity.

The factor  $r_A$  can also be named, Weighted Average Cost of Capital (WACC) according to Eriksson and Hede (1999:18) quoting Copeland and Weston, and in Megginson *et al.* (2010:422).

This equation then leads to the M&M Proposition II as seen in equation 2.8 (Megginson *et al.*, 2010:422):

$$r_L = r_A + (D \div E) (r_A - r_d) \quad (\text{Eq. 2.8})$$

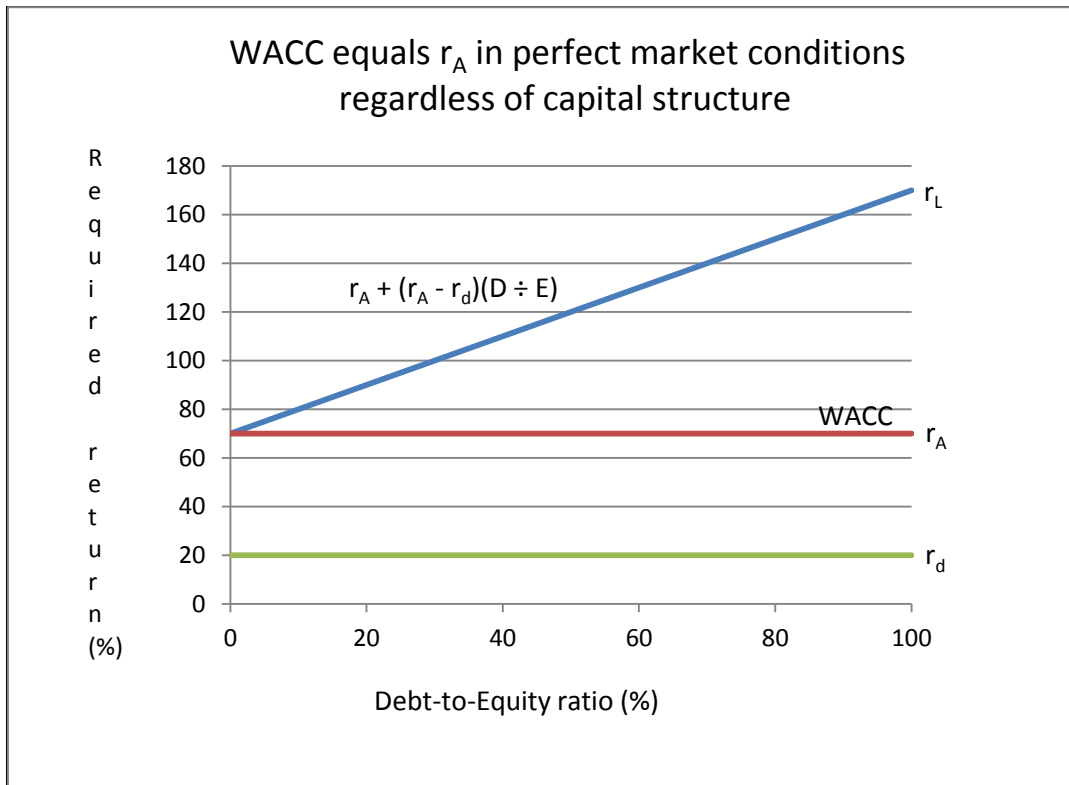
A linear relationship between the shareholders' rate of return and the firm's leverage is suggested by the M&M Proposition II according to Prasad *et al.* (2001:9). The expected return on equity is positively related to the leverage according to Proposition II, and the risk increases with leverage. The return on equity ( $r_E$ ) for different kinds of capital structures can be calculated seeing that it is known that  $r_A$  is constant for any capital structure, and that the return on debt ( $r_d$ ) is assumed to be constant. The required return on equity will increase proportionally to the increase in the amount of debt (Eriksson & Hede, 1999:18).

The cost of equity (the expected rate of return demanded by equity investors) increases with the market value of the debt to equity ratio (D:E). The rate of increase depends on the spread between the overall cost of capital ( $r_A$ ) and the cost of debt ( $r_d$ ). Myers (2001:94) states that "there is no magic in financial leverage" and this statement can be proven by Equation 2.8 (M&M Proposition II).

According to Proposition I the company's WACC ( $r_A$ ) is constant and when changing the capital structure, the firm's value is left unaffected (figure 2.1). Then, according to Proposition II the rate of return on equity increases as leverage increases (figure 2.3). This seems to be confusing. The following explanation might demystify the problem. Risk increases as leverage increases. Modigliani & Miller (1958:276) argued that when the firm moves from an unlevered structure to a levered structure, the operating income is divided on a smaller amount of outstanding shares (in the case of a share buy-back), which gives a larger return on equity ( $r_L$ ). Resultantly, the return on equity ( $r_L$ ) has increased, but risk (beta) has also increased.

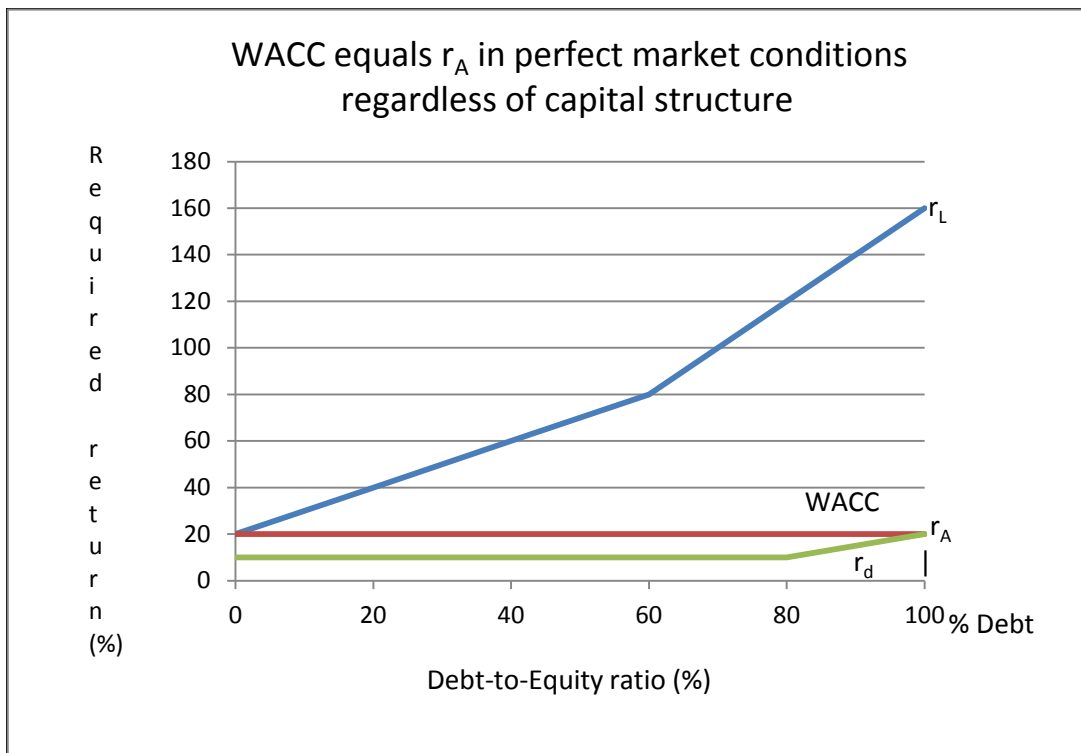
Figure 2.2 implies that  $r_L$  is not important when determining an optimal capital structure. The  $r_L$  is amplified by borrowing, but the increase in  $r_L$  is offset by the higher risk. This translates to WACC remaining constant even when firms alter capital structure; consequently firms are not better off with leverage (capital structure is irrelevant) and

WACC equals the required return on the firm's assets when capital markets are perfect (Megginson *et al.*, 2010:423; Van den Heever, 2007:14).



**Figure 2.2** M&M Proposition II in perfect market conditions  
(Source: Megginson *et al.*, 2010:423).

Figure 2.3 shows that the required return on equity rises as debt increases due to the increased risk borne by investors. WACC stays unchanged and is still equal to  $r_A$  regardless of the capital structure.



**Figure 2.3** M&M Proposition II in perfect market conditions.  
 (Source: Megginson et al., 2010:423).

Summarising the M&M Propositions without taxes: changing the capital structure from an unlevered firm to a levered firm, which might seem to be the cheaper option, will not reduce the net cost of capital. The initial cost saving of debt is exactly offset by the increases of the cost of capital of the remaining equity due to the higher risk the investor is bearing in a levered company. The value of the firm and the firm's overall cost of capital are invariant to capital structure, due to WACC being constant (Eriksson & Hede, 1999:25). Myers (2001:89) concludes that the propositions imply that financing does not affect firm value except for specifically identified costs or imperfections.

### 2.2.3 M&M with taxes

#### 2.2.3.1 M&M Proposition I

Although a follow-up paper authored by them was published in 1963, Modigliani and Miller already extended their proposition into three directions (Modigliani & Miller, 1958:272):

- 1) Recognising corporate profits tax under which interest payments are deductible.
- 2) Recognising the existence of a multiplicity of bonds and interest rates.

- 3) Acknowledging the presence of market imperfections which might interfere with the process of arbitrage.

In this section attention will be given to corporate taxes and the deductibility of interest payments. (Please note that dividend payments to investors carry no tax benefit).

Modigliani and Miller acknowledge that the value of all levered firms in the same risk class could not be proportional to the expected returns generated by their physical assets when taking corporate taxes into consideration. Corporate taxes make the assumption of "no arbitrage" nil and void. Knowing that debt has a tax advantage, the M&M propositions could then be extended to be interpreted as that debt can increase a levered company's value (Megginson *et al.*, 2010:424; Modigliani & Miller, 1958:272; Myers, 2001:87).

The final mathematical equation for M&M Proposition I with corporate taxes would be:

$$V_L = V_U + T_c D \quad (\text{Eq. 2.9})$$

Where:

$V_L$  = Value of a levered company.

$V_U$  = Value of an unlevered company.

$T_c D$  = Company tax rate multiplied by the value of debt, and assumes debt is perpetual. It is also interpreted as the present value of the interest tax shield.

Putting debt's interest tax shield differently; this means that there are advantages for a firm to be levered because corporations may deduct interest payments before calculating the amount of tax to be paid. This holds true according to the current South African tax law. Interest payments can be deducted due to interest paid being seen as an expense. Leverage is therefore encouraged due to lowering of tax payments and per implication having more cash flow available to distribute among the shareholders, ultimately increasing the firm's share price (Brigham & Ehrhardt, 2002:558; Megginson *et al.*, 2010:424).

**Table 2.2** Income statement: Comparison of the unlevered and levered firm values.

	Unlevered	Levered
EBIT	2,500,000	2,500,000
<u>Less: Interest payment</u>	0	-500,000
EBT	2,500,000	2,000,000
<u>Less: Tax payment @ 28 %</u>	-700,000	-560,000
Net earnings	1,800,000	1,440,000
Equity	11,000,000	8,000,000
Total debt	0	6,000,000
<b>Total value</b>	<b>12,800,000</b>	<b>15,440,000</b>

Source: Own.

Table 2.2 illustrates that a levered company pays less tax than an all-equity company does, because of its lower earnings before taxes (EBT). The EBT of the levered firm is less due to the interest payment on the debt part of the capital. Thus, the firm value (sum of debt plus equity) is greater for the levered firm.

### 2.2.3.2 M&M Proposition II

The M&M Proposition II with *no* taxes shows to a positive relationship between the expected return on equity and leverage. The same insight holds when corporate taxes are added, as seen in equation 2.10.

$$r_E = r_A + (D \div E) (1 - T_c) (r_A - r_d) \quad (\text{Eq. 2.10})$$

Where:

$r_E$  = Expected return on a levered firm's equity.

$r_A$  = Required return on the firm's assets.

$D$  = Market value of outstanding debt.

$E$  = Market value of outstanding shares.

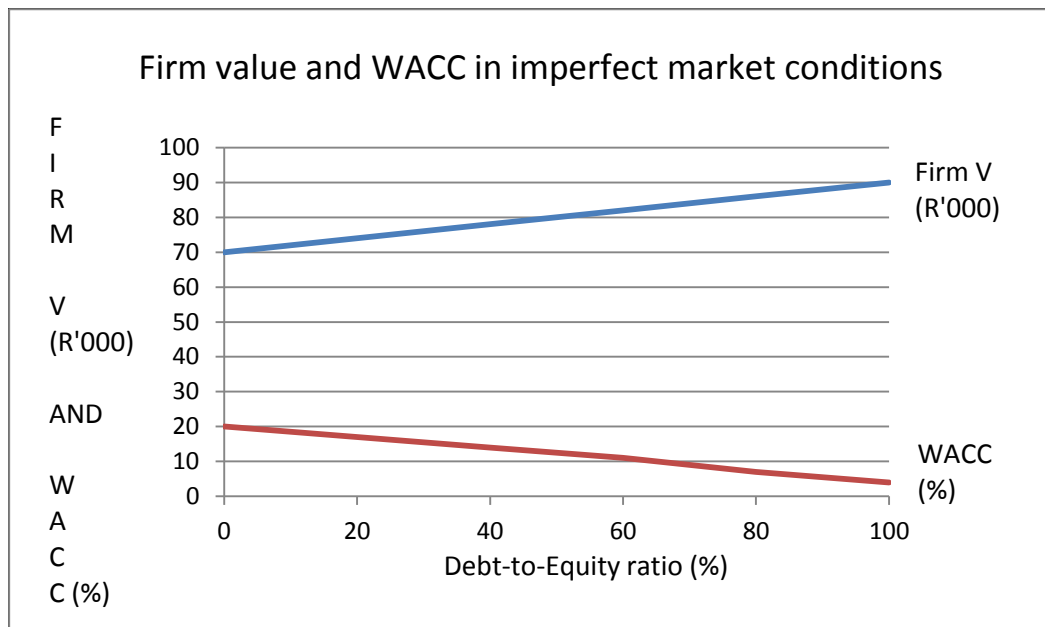
$(1 - T_c)$  = Corporate tax shield where  $T_c$  is the company's tax rate on profits (as decimal number).

$r_d$  = Cost of debt (interest).

The WACC when taxes are taken into account could be calculated as follows (Megginson *et al.*, 2010:320):

$$WACC = [D \div (D + E)] (1-T_C) r_d + [E \div (D+E)] r_E \quad (\text{Eq. 2.11})$$

Figure 2.4 illustrates that when corporate taxes are taken into account, a higher leverage level will result in a lower WACC. Comparing Figure 2.4 to Figure 2.1 it is clear that when taxes are taken into account, a higher leverage level will result in a lower WACC, but when taxes are not taken into account the WACC is constant even though leverage is increased. In the environment of corporate taxes the conclusion can be drawn that the firm value will increase with higher leverage since WACC will decrease (Figure 2.4). Eriksson & Hede (1999:20) quotes Copeland and Weston mentioning that the larger the amount of debt, the higher the value of the firm, which implies that a 100% debt financing should be implemented. More about the level of financing in section 2.3.1.



**Figure 2.4** M&M Proposition II with taxes

(Source: Megginson et al., 2010:430).

### 2.3 MODELLING CAPITAL STRUCTURE DYNAMICS

The previously discussed M&M propositions was the beginning of the current thoughts around capital structure theory. Today, numerous conditional theories exist to aid in the debt-equity decision but only three models made it to the mainstream of corporate finance. It is noted that one model, namely the trade-off model, provides a formula to calculate the optimal capital structure. Copeland and Weston as quoted in Eriksson and Hede (1999:21) remark that the pecking-order hypothesis and the signaling hypothesis

only try to explain the observed patterns, and not to calculate an optimal capital structure level.

Bradley *et al.* (1984:859) are of opinion that the theory of capital structure are among the most controversial issues in the theory of finance during the past quarter century. One of the foremost researchers in the field, Stewart Myers, has concluded that "there is no universal theory of the debt-equity choice and no reason to expect one" (Myers, 2001:81).

### 2.3.1 The Trade-Off Model

The trade-off model was developed by Jensen and Meckling in 1976. According to this model a company would aim for debt levels that balance the tax advantages of additional debt against the costs of possible financial distress. The cost of bankruptcy or reorganisation and agency costs that arise when the firm's creditworthiness is in doubt, all refer to financial distress (Myers, 2001:89). The trade-off model predicts moderate borrowing by tax-paying companies (Myers, 2001:81) and concludes that the optimal debt ratio maximizes the firm value (Megginson *et al.*, 2010:451). Please see Figure 2.5 for a graphical representation of the trade-off model.

The value of a levered firm in terms of an unlevered firm's value as adjusted for the present values of tax shields, bankruptcy costs and the agency costs of debt and equity is expressed by the trade-off theory.

The trade-off model in mathematical terms (Megginson *et al.*, 2010:451):

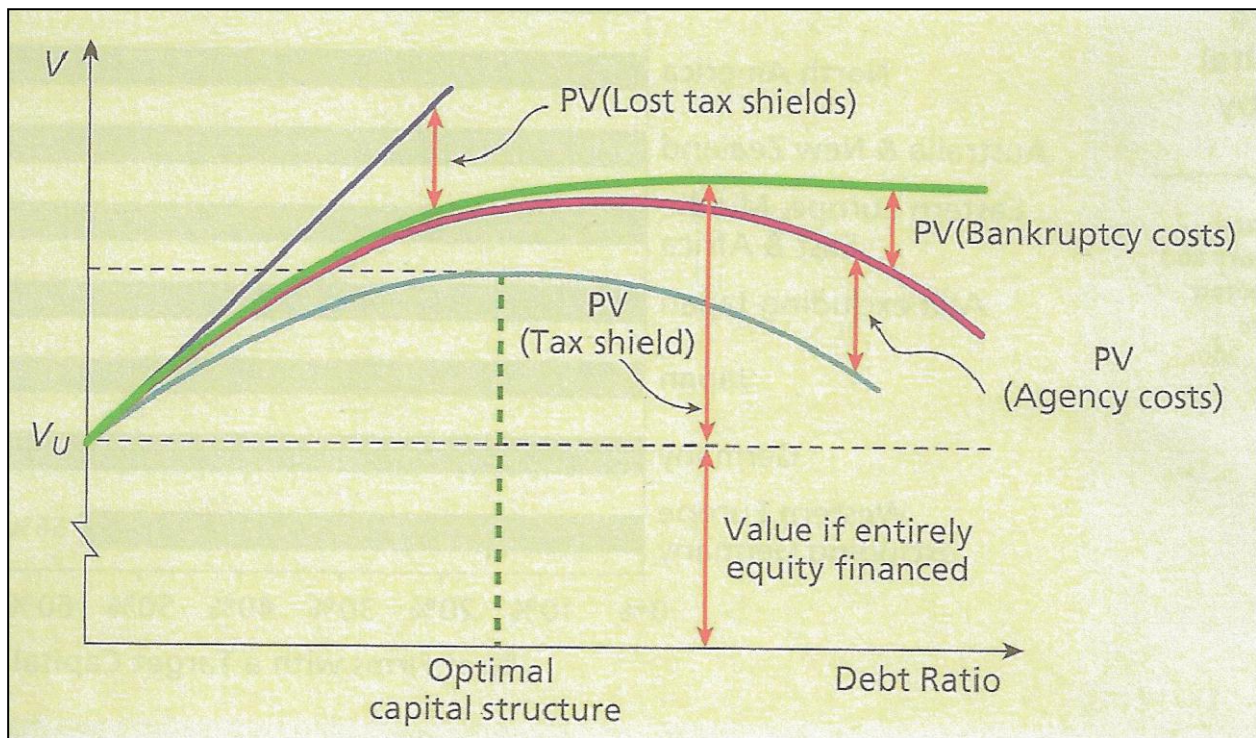
$$V_L = V_U + PV(\text{Tax shields}) - PV(\text{Bankruptcy costs}) - PV(\text{Agency costs}) \quad (\text{Eq. 2.12})$$

Where:

$V_L$  = Firm value of the levered firm.

$V_U$  = Firm value of the unlevered firm.

PV = Present value



**Figure 2.5** The trade-off model of capital structure incorporating taxes, bankruptcy costs and agency costs.

(Megginson *et al.*, 2010:451).

The trade-off model has four specific implications (Megginson *et al.*, 2010:451):

- 1) Profitable firms are thought to have more debt than unprofitable firms because they are more likely to benefit from debt tax shields.
- 2) Firms that own tangible, marketable assets should qualify for more debt than firms whose assets are intangible or highly specialised.
- 3) Safer firms should be able to borrow more than riskier firms.
- 4) Companies should ideally have a target capital structure.

Most evidence is consistent with the implications of the trade-off model but two inconsistencies are:

- 1) Profitable firms tend to have less debt and thus a lower debt ratio than unprofitable firms.
- 2) Firms issue debt frequently but equity issues are rare. The firm's share price can drop with as much as one third of the new offering's value when new equity issues are announced. This will be further discussed in paragraph 2.3.2 under the pecking order theory (Megginson *et al.*, 2010:453).

### 2.3.1.1 *Financial distress*

As the debt to equity ratio rises, so does a firm's potential inability to meet its financial obligation.

Bankruptcy costs are the costs associated with default. Bankruptcy costs are either direct or indirect costs. Direct costs are such things as legal and accounting fees, re-organisation costs, and other administrative fees. Indirect costs are more difficult to measure and refer to the impaired ability to conduct business. Indirect costs also refer to agency costs of debt that are specifically related to periods of high bankruptcy risk (such as the incentive for stockholders to select risky projects) (Eriksson & Hede, 1999:35). Some examples of indirect costs are lost sales, lost profits and higher interest rates (cost of debt). The inability to invest in profitable projects because external financing sources become unavailable is another indirect cost.

In the case of default, the levered firm's value is lowered by the present value of expected bankruptcy costs. Please refer to equation 2.12.

According to the estimation of Altman (1984:1071) the indirect and direct costs together are frequently greater than 20% of firm value, and indirect bankruptcy costs 10.5% of firm value. These educated estimations are enough to make us believe that bankruptcy costs are significant enough to support a theory of optimal capital structure that is based on the trade-off between gains from the tax shield and losses that come with the costs of bankruptcy. Warner (1977:338) found that direct costs of bankruptcy and the size of the firm is inversely related, meaning that the bankruptcy cost decrease when the size of the firm increases. This observation implies that for large companies, bankruptcy costs are less important when determining capital structure than it is for smaller firms.

Generally, the closer the firm is to bankruptcy, the larger the cost of financial distress. Haugen and Senbet (1978:387) are of opinion that bankruptcy is the ultimate financial distress. Bankruptcy entails the ownership of the firm's assets being legally transferred from the stockholders to the bond holders.

### 2.3.1.2 Agency costs

While managers are expected to act in the best interests of owners, it is not uncommon for them to act in their own best interests. Agency costs are the conflicts between manager interests and owner interests. These costs arise from said conflicts of interests.

The assumption is that as a firm increases its debt to equity ratio, its agency costs rise, and the value of a levered firm is lower as a result of the rise of agency costs. However, some viewpoints state that costs can actually decrease with debt. However, because it is difficult to measure agency costs, the influence agency costs have on the market value of a levered company is undetermined.

When a manager does not own any share of the equity of the company and the company is fully owned by external stakeholders, the agency costs associated with equity are at a maximum. Progressively these agency costs will fall to zero as the manager's equity share rises to 100%. Much the same, the agency costs of debt will be at a maximum when all the capital is obtained externally by using debt. As the level of debt falls, the debt agency costs are reduced. In conclusion; firstly, the amount of wealth that can be directed away from the debt holders decreases. Secondly, since the proportion of the equity that is held by the owner-manager is being diminished, the owner-manager's share of any re-directed wealth also diminishes (Prasad *et al.*, 2001:8).

### 2.3.2 The Pecking Order Theory

Titman & Tsyplakov (2005:16) point out that the crux of pecking order models is the costs associated with the issuing and repurchase of equity. The pecking order theory was proposed by Stewart Myers in 1984 and in its purest form it does not refer to target leverage. This theory suggests that firms have a particular preference order to finance the firm (Myers, 1984:578). Asymmetric information between managers and investors causes firms to prefer internal financing to debt financing and debt financing to issuing of shares (Donaldson, 1964:29; Myers, 1984:579). On account of information asymmetries between the firm and the market, firms prefer to fulfill financing needs by utilising retained earnings, followed by debt, and finally by equity (Prasad *et al.*, 2001:44).

The total amount of debt will reflect the company's cumulative need for external funds (Myers, 2001:81) provided internal sources have been exhausted.

In pecking order models a firm's history plays an important role in determining its financial structure.

Titman & Tsyplakov (2005:17) mention that a firm that realises a reduction in value because of very poor profits may become more highly levered due to a reluctance to issue equity. This higher leverage state is obtained to offset the decrease in the market value of its stock.

Trade-off behaviour and pecking order considerations need not be mutually exclusive (De Haas & Peeters, 2006: 135).

Trade-off considerations may be important in the longer term while pecking order behaviour favours the short term (Hovakimian *et al.*, 2001:11; Kayhan & Titman, 2004; Mayer & Sussman, 2004:12; Remolona, 1990:35). In conclusion: Donaldson (1964:30) found a preference/pecking order for how firms go about the issue of deciding on long-term financing:

- 1) Firms prefer internal financing to external financing of any sort when financing positive net present value (NPV) projects.
- 2) When a firm has insufficient cash flow from internal sources, it sells off part of its investment in marketable securities.
- 3) As a firm is required to obtain more external financing, it will work down the pecking order of securities, starting with very safe debt, progressing through risky debt, convertible securities, preferred stock, and lastly common stock.

### **2.3.3 Free Cash Flow Theory**

The free cash flow theory states that "dangerously high debt levels will increase value, despite the threat of financial distress, when a firm's operating cash flow significantly exceeds its profitable investment opportunities" Myers (2001:81).

This theory is mainly designed for the company that over-invests, like for instance in the case of a mature company.

### **2.3.4 The Signaling Model**

The signaling model assumes asymmetric information. Managers do not want to issue equity because it sends the signal that they are doing so because they feel that the stock is overpriced. Managers would not rationally issue stock they felt was undervalued (Myers, 2001:81).

The information asymmetry theory of capital structure was developed by Ross (1977:23) by removing another assumption underlying Modigliani and Miller's value invariance theory, namely that "the market possesses full information about the activities of firms". If rather it is assumed that managers possess information about the firm's future prospects that the market does not have, then managers' choice of a capital structure may signal some of this information to the market (Ross, 1977:24).

Ross (1977:32) further indicates that an optimistic future of the firm could be signaled by the managers by using a higher financial leverage. Increasing leverage signals to the market that the firm's managers are confident about being able to pay interest in future, and hence they are confident about future earnings prospects. Increasing leverage would, per implication, increase the value of the firm (Ross, 1977:32).

Another school of thought was led by Fama and French (1998:840), who highlighted the fact that more profitable firms tend to have lower levels of debt. They were of opinion that increasing debt actually signals poor prospects for future earnings and cash flow as there will be less internal financing available to fund development.

Baeyens & Manigaart (2003:53) mentions that information asymmetries decrease over the lifetime of a firm. However, it is unsure how signaling, within the context of information asymmetries, affects capital structure decisions. Information asymmetries and how they relate to the lifetime of the firm can not be looked at directly as an explanation of why capital structure might change over a firm's life cycle.

### **2.3.5 The Market-Timing Model**

Publicly traded US firms fund a much larger proportion of their financing deficit with external equity when the expected equity risk is lower, the first day returns of initial public offerings are higher, and prior (post) realisations of the Fama-French value factor is lower

(higher) (Huang & Ritter, 2004:4). Unlike the pecking order theory, there are consistent equity issues and announcement effects. Seasoned equity offerings are weak at best in relation to the volume of external equity financing. Firms also adjust slowly toward target leverage, and past security issues have strong and lasting effects on capital structure, even after control for target leverage.

## **2.4 CONCLUDING COMMENTS ABOUT THE MODELS**

As stated earlier, the trade-off model is the only model that provides a formula for calculating an optimal capital structure. The pecking order theory and the signaling model only attempt to explain observed capital structure patterns and how these structures are financed.

## **2.5 FACTORS DETERMINING CAPITAL STRUCTURE**

Several factors determine the capital structure of a firm. While these factors are all important, some are controllable whilst others are not. Whether controllable or otherwise, all of the following factors contribute to the capital structure of a firm.

### **2.5.1 Making use of the tax shield**

Debt payments are tax-deductible and lower the effective cost of debt. Therefore, if a firm's tax rate is too high, financing a project with debt is preferable (Modigliani & Miller, 1963:442), since the tax deductibility of the debt payments protects some income from taxes.

### **2.5.2 Non-debt tax shield**

Highly profitable companies have higher levels of debt. However, due to asymmetric information, firms prefer internal sources of finance to avoid negative signals sent out by equity financing. More profitable companies are expected to have lower debt levels and higher earnings. The level of profitability is negatively related to leverage, providing further support for the pecking order theory. However, the pecking order theory is unsuccessful in explaining inter-industry differences in debt ratios.

A firm's income can be protected from taxes by accelerated depreciation or tax loss carry-forwards. If most of the firms' income is protected by non-debt tax shields, its tax rate will be low, and in this case debt will not be as advantageous as it would be to a firm with a higher effective tax rate (Eriksson & Hede, 1999:31). DeAngelo & Masulis (1980:25) expect a negative association between non-debt tax shields and target leverage.

### **2.5.3 Profitability**

Profitable firms are much more likely to have sufficient internal finance. This means that they do not need to rely on external financial sources. Firms prefer to use internal financing as opposed to external financing, because the cost for external capital is greater for the firm (Cassar & Holmes, 2003:123). The relationship between profitability and leverage is negative (Chittenden *et al.*, 1996:62; Coleman & Cohn, 2000:84; Jordan *et al.*, 1998:25; Mishra & McConaughty, 1999:61; Van der Wijst & Thurik, 1993:59). While more profitable firms have easier access to external sources of capital, they prefer operations and investments to be financed by internal funds (Kim & Rasiah, 2011:157).

### **2.5.4 Income variability**

Higher income variability increases the risk that a firm may not be able to cover its interest payments. This leads to higher expected costs of financial distress. This implies a negative relationship between target leverage and income variability. However, higher income variability will lower the related agency costs of debt (Myers, 1977:148). If this happens, the relationship between income volatility and leverage becomes positive (as per Cools in De Haas & Peeters, 2006:147). Income variability is the standard deviation of the firm's turnover over a sample period. Because of this, it is time-invariant.

### **2.5.5 Trade credit**

Trade credit is an important alternative external financing source for firms that are inhibited by an external financing premium involving the usual sources of external financing. When trade credit is used in stead of "normal" debt, there is a negative relationship between leverage and trade credit (De Haas & Peeters, 2006:147). Trade

credit is the ratio of total credit to creditors and total assets, which are decreased by the total credit.

Creditors are excluded by the leverage measure and therefore trade credit could be included as an explanatory variable (Van den Heever, 2007:24).

### **2.5.6 Limitations to borrowing**

Lending and rating agencies are important when determining how much debt a firm is able to issue and to what extent the firm can make use of the tax shield (Eriksson & Hede, 1999:32). Banks may be hesitant to issue loans to firms that are already exposed to a higher level of leverage. An unsatisfactory debt coverage ratio may also limit a firm's ability to receive additional financing. A firm's bonds may be downgraded if more debt is issued. This can influence a firm's decision to finance expansion with equity.

### **2.5.7 Size**

There are many reasons for firm size being a determining factor in the capital structure of a firm. A larger firm has a higher credit rating than a smaller firm. This means that larger firms have easier access to debt financing due to lower information asymmetry. Because of this, larger firms are more likely to have higher debt capacity and are therefore expected to borrow more to maximize their tax benefit from debt because of diversification (Antoniou *et al.*, s.a.:5).

Smaller firms will often find it more costly to resolve information asymmetry with lenders and financiers (Cassar & Holmes, 2003:124). Because of this, smaller firms are offered less capital or offered capital at higher costs, which discourages the use of outside financing. According to Fama & French (1998), the information content between large firms and small firms is not the same, since monitoring costs are relatively higher for small firms. Also, according to Titman and Wessels (1988), if a size effect exists, it must be attributed to very small firms due to the much higher transaction costs.

Generally the larger firms tend to be more diversified and therefore they would be expected to have a lower risk of bankruptcy costs. Also, for large firms, fixed direct bankruptcy costs constitute a smaller portion of firm value, leading to relatively lower

costs of leverage (Titman & Wessels, 1988:14). The relationship between size and target leverage will then be positive.

### **2.5.8 Growth**

According to the pecking order theory, firms place a greater demand on the internally generated funds of the firm. Therefore, firms with high growth will tend to look outside the firm to finance said growth, as well as new investments. This means that large firms will rather look to short term, less secured debt, than they will to long-term and more secured debt for their financing needs. Put simply, growing firms that require funds prefer debt to external equity (Bhujoo-Hosany *et al.*, s.a.:12). According to the argument presented by Michaelas *et al.* (1999), in the case of SMEs; both growth opportunities and leverage are related positively because SMEs primarily use short term debt financing. Therefore, based on considerations from the pecking order theory, the relationship between growth opportunity and leverage is assumed to be positive.

Conflicts between owners and lenders would presumably lead to a negative relationship between growth and debt levels; which is supported by Jensen and Meckling's agency theory of debt (1976). Firms with growth opportunities should use less debt in order to handle agency issues. Because of asymmetries in information, companies with high leverage ratios may undertake activities that are contradictory to the interests of debt-holders (Myers, 1977). To compensate for the risk, debt-holders would need to charge a higher risk premium and would also have to impose debt covenants. This would restrict the freedom of directors and managers. To avoid this, growing firms should be less reliant on debt finance.

There are two main reasons for the negative relationship between growth and leverage; the first being that as growth opportunity increases, financial distress costs also increase (trade-off theory), and the second reason is that firms prefer to issue equity when stock is overpriced (information asymmetry) (Antoniou *et al.*, s.a.:4; Myers, 2001:83).

Considerations in the trade-off theory also point to negative relationships between growth and leverage. While growth opportunities do add value, a firm cannot use opportunities as security for lenders.

### **2.5.9 Age**

Older firms have been around much longer ensuring a longer track record and have had more time to build up relationships with suppliers of finance (Gertler, 1988:573). As a firm matures, its debt capacity resultantly increases. This implies a positive association between the firm's age and leverage. Looking at considerations from the pecking order theory, it can also be said that as the firm matures, it builds up its reputation. This build-up of reputation leads to better and easier access to equity markets. Due to these pecking order considerations, a negative relationship is expected between leverage and age.

### **2.5.10 Business risk**

Business risk is the volatility of a firm's operating income due to the nature of the firm's business. A firm's business risk is based on the uncertainty of demand, of output prices and input costs, competitive factors, product liability as well as other forms of liability.

It is also known that the greater the fluctuation in the Return on Assets (ROA), the larger the firm's business risk will be (Eriksson & Hede, 1999:32).

With larger business risk, the optimal leverage level will be lower. Business risk is therefore interpreted as one of the vital factors when making the capital structure decision.

Business risk could be estimated by examining the fundamental factors like the type of industry the firm is operating within, the number of growth opportunities the firm is faced with, the number of tangible assets the firm has, or the trend of demand, sales price and product range constitution variability. Firms operating in the same industries will be faced with more or less the same business risks. Capital-intensive firms with relatively few growth opportunities will be highly levered while technology-based industries with many growth opportunities should have relatively little debt. Firms with tangible assets have a higher leverage ratio in comparison to firms with intangible assets.

The other option is to calculate the unlevered beta. The unlevered beta stems from the beta equity that consists of the sum of a firm's business and financial risk. The beta

equity needs to be unlevered in order to refine the business risk. Thus, the unlevered beta can be calculated as follows (Eriksson & Hede, 1999:32):

$$B_A = [E \div \{D (1-T_C) + E\}] \times B_E + [D \div \{D (1-T_C) + E\}] \times B_D \quad (\text{Eq. 2.13})$$

Where:

$B_A$  = Beta asset.

$E$  = Equity.

$D$  = Long-term debt.

$T_C$  = Corporate tax rate.

$B_E$  = Beta equity.

$B_D$  = Levered beta.

Other factors being the same, the lower a firm's business risk, the higher its optimal debt ratio (Brigham & Ehrhardt, 2002:558). Put differently, the less risky a business, the more it can borrow.

#### *2.5.10.1 Industry*

Separate firms in the same industry will have similar leverage ratios. However, leverage ratios vary from industry to industry. According to a study done by Abor (2008), the industry effect is crucial in explaining capital structure and how it varies across industries. The industries that are most likely to use long-term debt are the agricultural, pharmaceutical, medical, construction, mining, and manufacturing industries. The industries most likely to use short term debt are the communications, wholesale, retail trade, and information industries (Ellili & Farouk, 2011:93).

Asgharin is quoted by Eriksson and Hede (1999:33) as saying: "Different industries experience different capital structure patterns, which prove that industry classification can be used as a proxy for business risk."

#### *2.5.10.2 Growth rate*

Firms in a growth stage of the firms' lifecycle typically finance their growth through debt. They borrow money in order to achieve faster growth. The issue that arises with this

funding method is that the revenues of growing firms are often unproven and unstable. Because of this, a high debt load would be inappropriate and therefore Myers' (1977:156) comment that industries with many growth opportunities should have relatively little debt due to the fact that growing firms have more flexibility in investment choices and may accept risky projects, come to mind. On the other hand, capital-intensive firms with few growth opportunities should be highly levered (Myers, 1977:156).

More mature firms need less debt to finance growth. The revenues of these firms have been proven and are stable. These firms are also more readily able to generate good cash flow to finance their projects through their cash cow products' sales.

### *2.5.10.3 Asset structure*

Due to the trade off theory, a positive relationship between asset structure and debt levels is predicted. As the value of intangible assets vanishes in the case of bankruptcies, the existence of tangible assets will become important in external borrowing, as these assets are easy to collateralise. Tangible assets lower the costs of financial distress, due to their higher liquidation value. This reduces the financial magnitude of loss incurred by financiers if the company defaults. By using a firm's tangible assets as collateral or directly placing a fixed charge on a firm's tangible assets, a firm's tangible assets are believed to support more debt than intangible assets.

As indicated, firms with tangible assets can support more debt. Tangible assets reduce agency costs because debt can be secured with known tangible assets with alternative redeployable uses in case of default. According to Scott (1977:13), a firm will issue as much secured debt as possible. This is because the agency costs of secured debt are lower than those of unsecured debt. Secured debt greatly reduces a firm's opportunity to engage in asset substitution. When a firm has more intangible assets, the costs of controlling capital outlay are increased as monitoring is more difficult. According to Stulz and Johnson (1985:515), firms holding secured debt have a harder time shifting to riskier projects if they possess more tangible assets. Creditors can impose restrictions on a firm with fewer tangible assets, which represents the positive relationship between leverage and asset structure (Nguyen & Ramachandran, 2006:202).

#### *2.5.10.4 Factors that cause stability or variance in future earnings*

The more stable a firm's sales are, the lower the business risk. If a firm has stable sales, it can safely accept more debt, and can incur higher fixed charges. A firm with unstable sales is unable to do this.

Firms with products sold on higher risk markets are exposed to greater business risk than those firms whose products are not sold on volatile markets, and who have relatively stable pricing (Eriksson & Hede, 1999:33).

### **2.5.11 Financial risk**

Simply stated, financial risk is the additional risk to a firm's investors when it borrows (Brigham & Ehrhardt, 2002:558). This involves the increasing risk of default and the increasing volatility of a firm's earnings per share, return on equity and net income that accompanies borrowing.

Financial leverage is a major factor in financial risk. This is the extent to which fixed income securities, such as debt and preferred stock, are used in a firm's capital structure. Financial risk is dependent on financial leverage, because of the additional risk that financial leverage places on stockholders.

Financial risk differs from business risk because it is solely dependent on the type of securities issued.

The following factors can be used in order to estimate financial risk:

#### *2.5.11.1 Leverage level*

Operating leverage is the use of fixed costs as opposed to the use of variable costs (Eriksson & Hede, 1999:34). If most costs are fixed, and do not decline when demand falls, the firm has a higher degree of operating leverage but also a greater financial risk.

### *2.5.11.2 Debt coverage ratio*

A firm's fixed payments can include principle payments, interest payments, and lease payments. If a firm wishes to take on additional debts, which would increase fixed charges, the firm must first examine its expected future cash flow. Fixed charges must be met with cash. If these charges cannot be met, the firm could face bankruptcy. Debt coverage is also useful in determining a firm's debt capacity. A debt coverage ratio of one means a firm can just cover its interest expenses (Eriksson & Hede, 1999:34).

Van Home in Eriksson & Hede (1999:34) states that a ratio below one means that a firm cannot cover its interest expenses. Simply stated, the larger the debt coverage ratio, the lower the financial risk.

### *2.5.11.3 Financial beta*

The combination of business and financial risk is the overall risk of a firm. To determine a firm's financial risk from its total risk, the firm's business risk must be subtracted from its total risk (Eriksson & Hede, 1999:35). Financial risk is determined by subtracting unlevered beta (beta asset) from beta equity (total risk). (Please refer to equation 2.13). What remains is a company's financial risk.

### *2.5.11.4 Financial flexibility*

This is a firm's ability to raise capital in bad times. When sales are growing and earnings are strong, companies do not have issues when it comes to raising capital. Because of this, firms should be prudent in raising capital during good times, being careful not to stretch capabilities too far. Companies with lower debt levels have greater financial flexibility.

## **2.5.12 Management attitudes**

Management attitudes range from aggressive to conservative. The more conservative the approach, the less likely a firm is to use debt to increase profits (as per Weston and Brigham in Eriksson & Hede, 1999:37). More aggressive management approaches may try to grow a firm more quickly by using fairly significant amounts of debt to ramp up the firm's earnings per share (EPS).

## **2.6 VALUE BASED MANAGEMENT (VBM) AND VALUE CREATION**

A shareholder wealth culture describes the core of VBM quite well (Brigham & Ehrhardt, 2002:508; Young & O'Byrne, 2001:5). Value Based Management (VBM) involves aligning employees' thoughts and behaviour to that of the owners. The general deviation of managers' attitudes to that of the owners that translates into costs for the investors/owners, are known as agency costs. Managers will for example not take on projects that will immediately produce a negative cash flow but in future will realise great profits because it will reflect negatively on their performance bonus for the immediate year and this action will harm the company because an opportunity to earn profits is lost. This way of thinking is the direct opposite of the owners who are considering the longer term rather than just the present. The owners' way of thinking ensure value creation and also sustainability.

Managers should aim to optimise shareholder wealth by optimising the firm's share price. Thus, optimizing shareholder wealth and not maximising profits is the aim of VBM. (As discussed in 1.1 fourth paragraph).

### **2.6.1 Objective in decision-making and value creation**

The primary objective of VBM centres on the optimisation of firm value. In practice conventional corporate financial theory argues that there are three ways of creating value (Van den Heever, 2007:30):

- 1) Improved investment decisions. The net present value (NPV) of the projects invested in must increase the value of the firm. Martin and Petty (2001:3) put it that value creation also demands management to be effective at identifying, growing and harvesting investment opportunities.
- 2) Making use of an intelligent financing mix for the firm. The optimal financing mix is necessary to obtain the lowest cost of capital.
- 3) Practice an effective reinvestment policy, which implies continued reinvesting as long as the project earns a return greater than the cost of capital for the specific project.

Value will be created when (Brigham & Ehrhardt, 2002:508):

Expected return on invested capital (EROIC) - WACC > 0

### 2.6.2 Value driver

The aim of managing the value drivers is to achieve an optimal capital structure and thereby aid in creating sustainable value.

Brigham and Ehrhardt (2002:535) show the four value drivers to be:

- 1) The growth rate in sales (g);
- 2) Operating profitability (OP), which is measured by the ratio of net operating profit after taxes (NOPAT) to sales;
- 3) Capital requirements (CR) as measured by the ratio of operating capital to sales; and
- 4) The weighted average cost of capital (WACC).

These value drivers can be linked to firm value in the following way:

- 1) The sales growth rate generally has a positive effect on value creation when the company is profitable. Sales growth will only have a negative effect on value creation when the growth requires a great deal of capital and if the cost of that capital is high.
- 2) Operating profitability (the after-tax profit per dollar/rand of sales), always has a positive effect on value creation: the higher the operating profitability, the more value is created.
- 3) The capital requirements ratio (CR) has a consistent effect. A lower CR means that the company can generate additional sales with smaller amounts of capital outlay. (CR measures how much operating capital is needed to generate a dollar/rand of sales).
- 4) The WACC links to the CR by also having a consistent effect. Lower WACC's creates more firm value (Brigham & Ehrhardt, 2002:518).

## 2.7 THE OPTIMAL CAPITAL STRUCTURE AND MAXIMISING FIRM VALUE

The optimal capital structure would be the structure which strikes a balance between risk and return to achieve the ultimate goal of optimising the price of the stock and simultaneously minimises the cost of capital (where WACC is the lowest) (Jones, 2005). The five steps for the analysis of each potential capital structure will now be discussed shortly.

### 2.7.1 Estimating the cost of debt

The cost of debt ( $r_d$ ) is the cost of borrowing money to finance a company's operations; it includes the current level of interest rates, a company's default risk, and the tax advantages associated with debt.

A company's cost of debt can be estimated as various hypothetical capital structures exist to review the company's range of debt coverage ratios and assume a certain amount of debt. The company is then assigned a hypothetical bond rating. This rating is based on the typical ratios for companies with debt rated in each category and assigned by one of the rating agencies. Once a synthetic rating is determined, an average default spread for debt in the rating category can be applied.

It is important to remember that firms are favoured by the benefit of the tax deductions available on interest paid. Therefore, the net cost of the debt is the interest paid less the tax savings resulting from the tax-deductible interest payment. This would mean that the after-tax cost of (interest-bearing) debt is  $r_d (1 - \text{corporate tax rate})$ . Keeping in mind that the cost of debt can be measured in either before- or after-tax returns; the most often encountered will be the after-tax cost due to interest paid being tax deductible.

Example: If a company's only bond was a single bond on which it paid 7% interest, the before-tax cost of debt would simply be 7%. Taking the tax benefit of debt into account and suggesting that the company's marginal tax rate was 28%, the company's after-tax cost of debt would be only 5%, calculated as follows  $[7\% \times (1-28\%)]$ . Brigham and Ehrhardt (2002: 564) remind that the cost of debt goes up as leverage and the threat of bankruptcy increases.

Having an "all-equity" firm (a company with no debt or preferred stock), the weight of debt and preferred stock is calculated as  $w_d$  &  $w_{ps} = 0$ , and the weight of its equity as  $w_s = 1.0$  (100% equity). It is clear that in this situation the calculation of WACC is simplified. Therefore, when firms have only equity in their capital structure,  $WACC = r_s$  as confirmed by Pagano and Stout (2004:17).

More commonly, though, it is found that companies' capital structures include at least some form of long-term interest-bearing debt. In this situation the after-tax cost of debt as well as the debt's weight (within the capital structure) should be estimated. It is put as estimated because when determining the weights of debt and equity, companies' market values rather than book values should be used. As debt is added to the capital structure, a company's financial ratios will consequently deteriorate, but its synthetic debt ratings will also worsen. This means that the cost of debt will increase, leading to the value of the firm decreasing. This is the reason why the market value of debt (and also equity) should be used in the estimation rather than the book value. Although it could be a bit tricky to estimate the market value of the said debt at times like for instance in the case of privately issued debt like bank loans and private placements of long-term debt, it is definitely the more accurate way.

From the above it is then implied that by looking at the effective rate that a company pays on its current debt (cost of debt), investors can form a good idea as to the riskiness of the company compared to others, seeing that riskier companies generally have a higher cost of debt.

A smaller, privately held company will likely have to add a small premium to each of the firm's market-observed spreads since ratings are generally applied to large, publically traded firms. The increased likelihood of default, and consequently the risk of these smaller firms, should influence the determination of the cost of debt.

### **2.7.2 Estimating the cost of equity**

Share capital carries no "explicit" cost and for this reason estimating the cost of equity can be a daunting task (McClure, 2012). A firm's cost of equity represents the compensation that the market demands in exchange for owning the asset and bearing the risk of ownership. The shareholders' required rate of return on the invested equity capital is in no uncertain terms, a cost from the company's perspective. The company will

interpret this required rate of return as a cost because if the company is not able to deliver this expected return, shareholders will simply sell the shares, leading to a drop in the share price and thereby destroying value for the remaining shareholders. It is then with good reason that McClure (2012) defines the cost of equity as basically being the rate of return the company must generate to maintain a share price theoretically satisfactory to investors.

Three models are known that can be used to estimate the cost of equity ( $r_s$ ): a single-factor model called the Capital Asset Pricing Model (CAPM), the Discounted Cash Flow (DCF) approach and the Bond Yield Plus Risk Premium model that financial analysts frequently use.

### 2.7.2.1 *Estimating the cost of equity with CAPM*

According to the traditional CAPM method, the required return on a risky asset, as is the case with common stock, is linearly related to a non-diversifiable risk (systematic risk) (Pagano & Stout, 2004:14). The systematic risk could be seen as the riskiness of the "market portfolio" of all combined risky marketable assets. McClure (2010) states that the most commonly accepted method for calculating cost of equity comes from the Nobel Prize-winning capital asset pricing model.

The Capital Asset Pricing Model (CAPM) states that investors need to be compensated in two ways for the share investment made: according to the time value of money and according to the risk taken. The equation for the CAPM is:

$$r_s = r_{rf} + \beta (r_m - r_{rf}) \quad (\text{Eq. 2.14})$$

Where:

**$r_{rf}$  = The risk free rate.**

This is the amount (rate) obtained from investing in securities that is considered free from credit risk. Such a security would be a government bond from a developed country. The U.S. Treasury Bills' interest rate is frequently used as a proxy for the risk-free rate (McClure, 2010). Stating this differently; this factor represents the time value of money because this part of the formula compensates the investor for placing money in any investment over a period of time.

The other half of the formula that follows represents risk. The following half of the formula calculates the amount of compensation the investor needs for taking on additional risk.

**$\beta$  = The beta of the security.**

This factor is calculated by taking a risk measure that compares the returns of the asset to the market over a period of time. A firm's beta can be estimated from a regression using historical data for the returns on the stock ( $r_s$ ) and a market portfolio proxy ( $r_m$ ). Typically, monthly return data are used when determining this regression.

**$(r_m - r_{rf})$  = The market premium.**

Where:

**$r_m$  = The expected market return.**

**$r_{rf}$  = The risk free rate.**

The equity market risk premium (EMRP) represents the returns that investors expect as compensation, above the risk-free rate, for taking extra risk by investing in the stock market. In other words, it is the expected market return minus the risk-free rate (McClure, 2006). Keeping in mind that investors, in general, are averse to risk, a higher expected return is required to motivate the investors to invest in risky equities versus relatively low-risk investments. Brigham and Ehrhardt (2002:313) and McClure (2010) are of opinion that the premium can be estimated on the basis of historical data or prospective data.

Where:

**$r_m$  = The expected market return.**

According to McClure (2010) a beta of one would for instance indicate that the company moves in line with the market. Should the beta be greater than one, the share is faring better than the current market. Less than one means the share is more stable than and not as volatile as the current market. Occasionally a company could have a negative beta, which would indicate that the share price moves in the opposite direction of the broader market. It is helpful to know that, according to McClure (2010), database services that publish betas of public companies exist.

In 1969 Robert Hamada formed the Hamada equation when he combined the traditional CAPM and the Modigliani and Miller capital structure (Quicken, 2002). Herewith Hamada

attempts to illustrate how, by increasing debt, financial leverage increases a firm's risk, and by extension the firm's beta.

The Hamada equation is as follows:

$$\beta_L = \beta_U [1 + (1-T) (D \div E)] \quad (\text{Eq.2.15})$$

Where:

D = The market value of debt.

E = The market value of equity.

$\beta_U$  = The firm's unlevered beta coefficient. (The beta it would have if it had no debt).

The Hamada equation uses the Hamada coefficient to determine the effects of financial leverage on a firm. The higher the Hamada coefficient, the higher the risk would be that is associated with the firm. The Hamada equation clarifies how increases in the market value (D/E ratio) increases beta (Brigham & Ehrhardt, 2002: 565).

#### 2.7.2.2 *The Discounted Cash Flow (DCF) approach*

The DCF approach allows the value of a firm to be valued using the time value of money. All future cash flows are therefore estimated to give their present values (PV's). The sum of all future cash flows (incoming and outgoing) forms the net present value (NPV). The NPV is the value of all cash flows.

The DCF approach expresses the cost of common equity as the dividend yield (the expected dividend divided by the current price) plus the expected growth rate.

$$r_s = (D_1 \div P_0) + \text{expected } g \quad (\text{Eq. 2.16})$$

Where:

$r_s$  = The expected rate of return.

$D_1$  = The dividend expected to be paid at the end of Year 1.

$P_0$  = The current price of the stock.

Expected  $g$  = The growth rate can be estimated by two methods, either by using the historical earnings and dividends or by using the retention growth model. According to the retention growth model;

$$g = (1 - \text{payout}) (\text{return on equity}) \quad (\text{Eq. 2.17})$$

Brigham and Ehrhardt (2002:13) states that recent surveys found that compared to 1982, when 31% of all analysts used the DCF approach, only 16% of the same analysts currently use the DCF approach.

### 2.7.2.3 *The Bond Yield plus Risk Premium method*

This approach is a subjective procedure for estimating the cost of equity. In this approach, a judgmental risk premium to the observed yield on the long term bonds of the firm is added to get the cost of equity. The BY+P method is favoured by amongst others, multibillionaire investor Warren Buffett. According to him, the BY+P method is simple and limits the number of assumptions the investor needs to make. This is regardless of the fact that this method is essentially an ad hoc empirical relation with no solid theoretical justification according to Pagano and Stout (2004:15).

$$\text{Cost of equity} = \text{Yield on long-term bonds} + \text{Risk Premium} \quad (\text{Eq. 2.18})$$

### 2.7.2.4 *Comparison of the CAPM, DCF and BY+P methods*

All of the above discussed methods are dependent on the risk factor that the firm may pose. The difference in the methods comes into play in terms of how risk is handled and what different present or future factors are included for examination.

The methods with a futuristic look are more proactive, such as the DCF method and the CAPM. According to Brigham and Ehrhardt (2002:320), surveys found that the CAPM approach is the most popular method used when estimating the cost of equity ( $r_s$ ). The CAPM method is probably so popular because it provides a usable measure of risk that helps investors to determine what return should be earned for putting the invested money

at risk. Recent surveys found that almost 74% in one survey and 85% in the other used the CAPM.

BY+P is more subjective and also has a long-term perspective, but it looks at the bonds and not the cash flow or returns that the firm will generate. Brigham and Ehrhardt (2002:320) also state that companies that are not publicly traded mostly use this method.

### 2.7.3 Estimating the cost of preferred stock

The cost of preferred stock is the rate of return required by an investor who owns preferred stocks and this cost is also used in the calculation of WACC. In order to calculate the cost of preferred stock the following formula is used:

$$r_{ps} = D_{ps} \div P_n \quad (\text{Eq.2.19})$$

#### Where:

$r_{ps}$  = The required return on the preferred stock.

$D_{ps}$  = Dividends on preferred stock.

$P_n$  = Issuing price of preferred stock.

It is quite common to find firms using preferred stock as part of the permanent capital structure. In some parts of the world dividends on preferred stock are not allowed as being tax deductible. For this reason no tax adjustment is used when calculating the cost of preferred stock (Brigham & Ehrhardt, 2002:310).

Furthermore if the preferred stock has no stated maturity date, then the formula for calculating the cost of preferred stock is as follows:

$$\text{Cost of Preferred Stock} = (\text{Dividend on Preferred stock} \div \text{Price of Preferred stock}) \div (1 - \text{Flotation Costs}) \quad (\text{Eq. 2.20})$$

#### Where:

Price of the Preferred stock is at current market value; and

Flotation costs are the underwriting costs for the issuance of the preferred stock stated as a percentage.

Usually, the cost of the preferred stock will be higher than the cost of debt as debt is seen as the least risky component regarding the cost of capital.

#### 2.7.4 Estimating the weighted average cost of capital (WACC)

WACC is the total cost used to finance or purchase a business. A firm's WACC represents a quantification of the average return expected by *all* shareholders in the firm: creditors of short-term and long-term interest-bearing debt, preferred stockholders and common stockholders.

WACC is calculated using the respective costs of debt and equity and their relative proportion in the deal structure. Especially the debt and equity proportions/weights are determined by making use of the market values because it reflects the most accurate value of the company (Pagano & Stout, 2004:17).

As previously stated, a firm's WACC is the overall required return for the firm as an entity and, as such, it is often used internally by company directors to determine the economic feasibility of expansion opportunities and mergers.

The WACC equation is the cost of each capital component, multiplied by its proportional weight and then summing the weighted components:

$$\text{WACC} = (w_d)(r_d)(1 - T) + (w_{ps})(r_{ps}) + (w_s)(r_s) \quad (\text{Eq. 2.21})$$

#### Where:

- $r_d$  = The expected cost of long-term debt.
- $r_{ps}$  = The expected cost of preferred stock.
- $r_s$  = The expected cost of common stock.
- $w_d$  = The weights of long-term debt.
- $w_s$  = The weights of common stock.
- $w_{ps}$  = The weights of preferred stock.
- $T$  = The firm's marginal income tax rate.

Van den Heever (2007:39) states that according to De Boyrie, the cost of capital is important especially for financial managers in terms of:

- 1) Optimising the value of the firm. The financial manager must minimise all costs.
- 2) Making capital budgeting decisions. The financial manager must discount the cash flows of the project by the cost of capital.
- 3) Other investment decisions like for example short-term financing and bond refunding.

Various factors exist that affect a firm's cost of capital like for instance the financial environment, but on the other hand the firm also influences others through its financing, investment and dividend policies (Brigham & Ehrhardt, 2002: 334).

Professionals also use WACC in computing financial performance metrics such as economic value added (EVA) and residual income.

### **2.7.5 Estimating the firm's value**

It is stated that every firm has a target capital structure, defined as that mix of debt, preferred and common equity that causes its stock price to be optimized. Therefore, a value-maximising firm will establish a target capital structure and then raise new capital in a manner that will keep the actual capital structure on target over time.

The value of a firm is obtained by discounting the free cash flow to the firm at the weighted average cost of capital. Embedded in this value are the tax benefits of debt and expected additional risk associated with debt. Part of estimating the firm's value depends upon assumptions made about future growth.

The following equation can be used to estimate the value of a firm which has zero growth:

$$V = FCF \div WACC \quad (\text{Eq.2.22})$$

Where:

V = Value of the firm.

FCF = Free Cash Flow.

WACC = Weighted Average Cost of Capital.

### 2.7.5.1 Free cash flow (FCF)

Free cash flow, is also known as unlevered free cash flow, and is important in valuing the operations of a firm. The term Free Cash Flow (FCF) is used because the cash is free to be paid back to the suppliers of capital after all the investments in fixed assets and working capital necessary to sustain ongoing operations had been made.

The value of a firm primarily depends on its expected *future* free cash flows. Therefore, for managers to optimize firm value, it is necessary to increase (future) FCF (Brigham & Ehrhardt, 2002:107).

The equation to calculate FCFs is as follows:

$$\text{FCF} = (\text{NOPAT} + \text{Depreciation}) - \text{Net Investment in operating capital} \quad (\text{Eq. 2.23})$$

The NOPAT component will be discussed in 2.7.5.2.

It needs to be mentioned that a high FCF can lead to higher agency costs with managers not acting in the best interest of shareholders.

### 2.7.5.2 Net operating profit after taxes (NOPAT)

NOPAT is a company's potential cash earnings after tax, should the company have no debt and no investments in non-operating assets.

Brigham and Ehrhardt (2002:118) are of opinion that, due to the fact that NOPAT excludes the effects of financial decisions, it is a better measure of operating performance than net income. NOPAT can be calculated as follows:

$$\text{NOPAT} = \text{EBIT} (1 - \text{Tax rate}) \quad (\text{Eq. 2.24})$$

Where:

EBIT = Earnings before interest and taxes.

There are three basic steps to calculating a firm's NOPAT:

- 1) Begin with a firm's EBIT.
- 2) Make key adjustments. Eliminate accounting distortions by converting accrual to cash. Also, some expenses must be reclassified as investments.
- 3) Subtract cash operating taxes.

Brigham and Ehrhardt (2002:108) also commented that "a negative free cash flow is not necessarily bad. If FCF is negative because NOPAT was negative, that is a bad sign. However, many high-growth companies have positive NOPAT but negative free cash flow because companies are making large investments in operating assets to support growth. There is nothing wrong with profitable growth, even if it causes negative cash flows."

### 2.7.5.3 *Return on invested capital (ROIC)*

ROIC is used to determine a firm's success at allocating the capital under the firm's control to profitable investments. The ROIC determines how well a firm is handling its capital to generate returns. Comparing a firm's ROIC with its WACC determines whether invested capital was successfully used to generate income. Below is the general equation for determining ROIC:

$$\text{ROIC} = \text{NOPAT} \div \text{Operating Capital} \quad (\text{Eq. 2.25})$$

Brigham and Ehrhardt (2002:108) concludes that if ROIC is greater than the rate of return investors require/WACC, then the firm is creating additional value. If WACC exceeds ROIC, then new investments in operating capital will reduce the firm's value.

## 2.8 CONCLUDING COMMENTS

Franco Modigliani and Merton Miller (M&M) who did groundbreaking work in 1958 relating to corporate financing and specifically capital structure, pointed out that financing is irrelevant in perfect capital markets (no taxes or transaction costs). They later included taxes and bankruptcy costs (realising the reality of imperfect markets) and stated that an optimal capital structure does exist where debt-tax shield benefits need to be balanced with bankruptcy costs. M&M are also of opinion that the capital structure decisions do not influence the market value of a firm.

Proposition II (1963) argues that the expected return on equity is positively related to leverage, and also that the risk increases with the leverage.

To aid in the debt-equity (capital structure) decisions, numerous conditional theories exist but no universal theory is known and no universal theory is expected. Unfortunately, the main models, namely the pecking order hypothesis, the trade-off model and the signaling hypothesis do not assist in calculating an optimal/target capital structure. A formula for calculating the optimal/target capital structure is suggested only by the trade-off model. The other two models only clarify the observed patterns.

The optimal/target capital structure for a firm is determined by a multitude of factors under which the firm's marginal tax rate, debt-tax shields, profitability, income variability, size, growth and the industry the firm is doing business in, exist. The likelihood and magnitude of certain costs like that of financial distress and agency costs also influence the capital structure decisions.

According to VBM and specifically capital structure, managers should choose the capital structure that optimises the shareholders' wealth. This target capital structure should then be adhered to when making decisions regarding financing the firm. The five steps for the analysis of each potential capital structure have been explained in detail in this chapter.

VBM optimizes shareholders' wealth by increasing the value of the firm. In return the firm's value primarily depends on its expected future FCF. Therefore, for managers to practice VBM, it is necessary to increase FCF.

## CHAPTER 3

### RESEARCH METHODOLOGY

#### 3.1 INTRODUCTION

The overall purpose of research is to determine the relational aspects of pre-established variables. The biotechnology industry is one that has become increasingly popular over the last two decades, especially so in South Africa, as advancements in the fields of medicine, food and agriculture, and forensics are achieved within this field of study (Tong, 2004:1). The biotechnological sector is part of the healthcare super sector (and industry) that is being researched for this paper. This research will focus exclusively on the field of pharmaceutical technological growth within the biotechnological industry and the growth in the healthcare equipment and services sector. The most basic definition of biotechnology describes it as the application regarding information of living systems for use in an industrial capacity (Tong, 2004:1) and this field of research within the context of pharmaceutical developments has the potential to contribute significantly to the benefit of humanity and the capital structure of the South African economy. In addition, pharmaceutical innovations permit unlikely partnerships that reveal the inadequacies of current public health programs and attempt to reform the global procedures related to drug pricing and the types of medical and philanthropic interventions (Biehl, 2007:1088) available to the poor and underprivileged.

The goals of this dissertation are divided into primary and secondary objectives. The primary objective of the study is to determine whether a management framework can be developed to manage capital structure for optimal value creation for companies listed under the healthcare sector on the JSE. The secondary objectives of this research include:

- 1) Determining whether a linear relationship exists between sustainable value creation and optimal capital structure.
- 2) Establishing what the range of an optimal capital structure would be for a company in the healthcare sector.
- 3) Determining to what extent an optimal capital structure can contribute to building sustainable value (determining if it is a significant contribution). Creation of sustainable value will be measured by assessing the Change in share price and Share price of each target company.

Both the primary and secondary objectives of this research study will be achieved through examination of numerous institutional case studies and other background information. In addition, qualitative and quantitative data analysis will be used as study methodology. Analysis of the healthcare sector which includes biotechnological pharmaceutical market structure prevalent in South Africa will be scrutinized along with the capital market structures of the most prominent companies to determine the arrangement most profitable for the current market. The per share value of these companies on the JSE will also be assessed to determine the company with the highest ranking and this will be used as an indicator of a successful market capital configuration. However, the most beneficial elements of the VBM and capital structure of each company will be allocated for potential inclusion within the comprehensive framework this dissertation aims to develop, to manage capital structure for optimal value creation for companies listed under the healthcare sector on the JSE.

### **3.2 RESEARCH DESIGN**

This research, pertaining to the specific objectives, consists of four subsections, which encompass the:

- 1) Research design.
- 2) Research sample group.
- 3) Statistical analysis; and
- 4) Report of findings.

Within these contexts, a comprehensive theoretical review is given, including an overall analysis of capital structure in general and capital structure as it pertains to the health care sector including the pharmaceutical and biotechnology sector. The sources consulted include:

- 1) Journal and magazine articles.
- 2) Text books, and
- 3) Internet websites.

This empirical study will utilize these resources to compile relevant information that will assist in the formation of analytical findings regarding the stability and reliability of the capital market structure of the target pharmaceutical and healthcare service firms within the healthcare industry. The research design consists of the participants and the details

regarding their company's capital structure and VBM system. This research can be classified as mostly descriptive because an attempt is made to describe the relationship between sustainable value creation and the optimal capital structure. The research conducted pertains to the Financial Management module in the area of capital structure, specifically how the optimal capital structure can contribute to building sustainable value and maximise shareholder wealth.

Quantitative historical financial data will be analysed to maintain the integrity of the research approach. The appropriate historical financial data obtained from the McGregor BFA database will be utilised as secondary data, including financial statistics from 2006 to 2010.

Additional considerations will be given to Changes in Share Price and Share Price which are classified as the dependent variables that will be used to represent the sustainable shareholder wealth.

These variables will be measured against changes in net operating profit after tax (NOPAT), earnings before interest and taxes (EBIT), cost of sales (COS), weighted average cost of capital (WACC), return on equity (ROE), return on assets (ROA), debt to equity ratio (D:E), and the return on invested capital (ROIC), book value per share (BV/S), cash flow per share (CF/S), cash flow interest cover (CF int cov), price per book value (Price/BV), price per cash flow (Price/CF), price per earnings (P:E), price per net asset value (Price/NAV), economic value added (EVA) and free cash flow (FCF) all of which are classified as the independent variables. This design structure is implemented to allow for the most comprehensive analysis of all the JSE listed players within South Africa's healthcare sector. Within this research plan, all of the perceived important variables have been accounted for and are incorporated into the study to ensure that the results are reliable.

### **3.3 RESEARCH SAMPLE**

The sector of the JSE that will be used in this research is the healthcare sector. In South Africa what is collectively known as the Pharmaceutical Task Group (PTG) represents 57 individual manufacturing companies that collectively comprise more than 80% of all medicines sold within the South African market (Deloitte, 2010:4). For the purpose of this

study, the capital structures of the four topmost biotechnology companies within the field of pharmaceuticals will be examined as well as two of the healthcare services companies. There are currently four companies listed under the pharmaceutical and biotechnology sector of the JSE and all four of these companies will be included in this research. The four companies by name are Adcock Ingram Holdings Ltd. (Adcock), Aspen Pharmacare Holdings Ltd. (Aspen), Cipla Medpro SA Ltd. (Ciplamed) and Imuniti Holdings Ltd. (Imuniti). The healthcare equipment and services sector consists of two companies by name of Netcare Ltd. (Netcare) and Mediclinic Southern Africa (Mediclinic).

### **3.3.1 Adcock Profile**

The pharmaceutical division of Adcock manufactures, markets, and sells branded and generic versions of prescription medications as well as over-the-counter (OTC) medications available in solid, liquid, injection and inhaler versions (Adcock Ingram, 2008). This branch of the company is divided according to prescriptive products, which includes medications rated Schedule 3 (see Appendix 1) and above, and OTC products, which includes non-prescriptive and Schedule 0-2 (see Appendix 1) medications (Adcock Ingram, 2008). The pharmaceutical division of Adcock currently enjoys approximately 11.3% of the private healthcare market which consists of OTC and prescription products, holding the top position in OTC medicines and ranking second in generic prescriptions (Adcock Ingram, 2008). In addition, Adcock is ranked second in the fast-moving-consumer-goods (FMCG) channel and enjoys a century-old tradition of brand excellence that keeps them ranked first and second among pharmacists and general practitioners in pharmaceuticals and OTC medications (Adcock Ingram, 2008). Adcock's extensive branded and generic prescription portfolio combined with their qualitative portfolio of OTC products has allowed them to remain the lead supplier of pharmaceuticals in South Africa (Adcock Ingram, 2008).

### **3.3.2 Aspen Profile**

The pharmaceutical division of Aspen is a supplier of an extensive line of branded, generic, over-the-counter (OTC), self medication, personal care and infant nutritional products (Aspen Pharmacare, 2008). As one of the largest producers of generic medicine in the southern hemisphere (Aspen Pharmacare, 2008), Aspen is a leading distributor of pharmaceuticals and provides products to public and private sector clientele all over South

Africa. Aspen is currently the leading supplier of ARVs (antiretroviral medicine) through South Africa's health department, encompassing 50% of the market or better, to supply millions of people with the necessary drugs to combat the HIV/AIDS epidemic in South Africa (Aspen Pharmacare, 2008). With their pharmacopeia available with numerous methods of application, Aspen has consistently been rated number one within the market more times than any of their competitors and is considered number one in the OTC market (Aspen Pharmacare, 2008). With more than 150 years of experience in the manufacturing of pharmaceutical products, Aspen enjoys a reputation for impeccable products that allows them to even manufacture a successful line of products for infants (Aspen Pharmacare, 2008).

### **3.3.3 Cipla Profile**

Formerly known as Enaleni Pharmaceuticals Ltd., Cipla is one of the fastest growing local pharmaceutical companies and includes a portfolio of the most advanced pharmaceutical products designed to provide treatment for some of the most challenging illnesses, like HIV/AIDS, cardiovascular disease, antimalarials, and oncology treatments (Cipla Medpro, 2011). Cipla Medpro has a newly upgraded R250 million facility that has achieved international Pharmaceutical Inspection Co-operation Scheme (PICS) standards, making it one of the first in South Africa to attain this lofty status (Cipla Medpro, 2011). Cipla primarily manufactures an elite line of specialty products in addition to offering contractual manufacturing solutions to local and multinational companies (Cipla Medpro, 2011). The company's business model is based on the primary philosophy that affordable healthcare is a right for all South Africans and attempts to realize this belief by providing the world's most scientifically advanced medicines to the private and public sectors at affordable prices (Cipla Medpro, 2011).

### **3.3.4 Imuniti Profile**

Imuniti Holdings Limited was renamed Nutritional Holdings Ltd. and includes numerous subsidiary companies, like PB Tully Family Holdings (Pty) Limited, Impilo Marketing (Pty) Limited, Nutritional Foods (Pty) Limited and Impilo Drugs (1966) (Pty) Limited (Corporate information, 2012). Imuniti produces and markets an array of pharmaceutical products, natural medicines, and high-protein fortified powdered nutritional food products and supplements (Corporate information, 2012). The company is segmented into three main

divisions, consisting of Nutritional Foods, Pharmaceuticals, and Services (Corporate information, 2012). Imuniti's staple product is the Imuniti Pack, which is a basic package that contains a variety of natural immune boosting products and high-protein fortified nutritional supplements, as well as supplies to decontaminate water (Corporate information, 2012). Despite the company's name change, Nutritional Holdings Ltd. remains committed to developing and providing affordable, sustainable wellness products, services, and programmes while actively promoting the socio-economic welfare of South Africans and the general populace of sub-Saharan Africa (African Financials, 2009).

### **3.3.5 Netcare Profile**

Netcare is South Africa's third biggest publicly traded private hospital owner by market value. The full year 2011 profit increased 27% due to facilities expanding and its UK business paying lower taxes. On the front of expanding facilities, a new 126-bed hospital was opened in Midrand in July 2011.

Netcare is planning on expanding in South Africa in the new fiscal year (2012) and they remain confident that the demand for healthcare will be sustained in the country although they foresee a very challenging next 12 months due to government budget savings that continue and the private caseload that remains "constrained".

The Medicross provider services operate a national footprint of 108 Medicross and Prime Cure Medicentres which include 41 retail pharmacies and 12 day theatres. The Medicross Provider Group was acquired as a 100% subsidiary by the Netcare Group in 2001 and the Prime Cure Group was acquired by Medicross in 2006 (Netcare, 2009).

### **3.3.6 Mediclinic Profile**

Mediclinic Southern Africa is the sixth largest private hospital group in the world with 76 medical facilities internationally. Mediclinic Southern Africa represents the Southern African operations of Mediclinic International. Mediclinic has facilities in Southern Africa, Namibia, Switzerland and the United Arab Emirates. In Switzerland Mediclinic owns the largest private hospital group, Hirslanden and in the United Arab Emirates it holds the controlling share in Emirates Healthcare.

In South Africa and Namibia alone Mediclinic have 7,130 beds in 52 multidisciplinary hospitals. Stellenbosch-based Mediclinic International Ltd. and Life Healthcare Group Holdings Ltd. are South Africa's two most valuable publicly traded hospital operators (Kevv, 2011).

Mediclinic's business strategy is patient-focused and they aim to deliver highly skilled medical personnel to deliver the best possible care (Mediclinic, s.a.).

### **3.4 DATA ANALYSIS**

The data used in this dissertation has been taken from the McGregor BFA database using Microstation as the interface tool. Statistical analysis has been done to determine the relationship between the dependent variables (Change in share price and Share price) and the independent variables considered to have an impact on the dependent variables for the 5 years from 2006-2010. All calculations have been done annually for each of the years within the chosen period to prevent autocorrelations of group calculations clouding the results. Grouping all of the years in the period together and then doing the calculations would not be the best option for analysing the data due to everyone of the included six companies being independent of each other and the years being dependent of each other. The implication of doing a group data analysis would be that if in one year higher (or lower) values would appear, it would influence all of the following years' calculations unduly.

Correlations between the dependent and independent variables have been tested so that it could be concluded which of the chosen independent variables' values would be the best to use to predict the dependent variables' values. The correlations have been further tested by stepwise forward regressions and also by manually picking the highest correlated independent to dependent variables.

Due to the little data available for the companies listed under the healthcare sector on the JSE and due to the fact that so few companies are listed on the JSE, regression analysis becomes difficult because the predictability of the results diminishes. The results obtained would only be accurate for the specific data set and the predictions would not hold true in general for the healthcare sector.

Although regression analysis was done for the purpose of this paper, note is taken of the fact that descriptive statistical analysis would be more sensible due to the small data pool.

### **3.5 VARIABLES INCLUDED IN THE DATA ANALYSIS**

Choosing the optimal capital structure can be a complex decision but is undoubtedly a very important one. The capital structure that maximises share holder value is the structure that is aimed for. Brigham and Ehrhardt (2002:572) state that the optimal capital structure for a firm is a function of numerous factors including the firm's business risk, its marginal tax rate, the amount of non-interest tax shields, the variability of the firm's operating earnings, and the likelihood and magnitude of the costs of financial distress for that firm. It is then concluded that the optimal capital structure is not a static structure but should be dynamic and adjusted according to the changing circumstances that the firm is doing business in.

Two dependent or response variables and seventeen independent variables have been selected to investigate the relationship between capital structure determinants and sustainable value creation. Historical financial data for the period from 2006 up to and including 2010 for all the companies listed under the JSE healthcare super sector (and per implication healthcare industry) has been included in this research.

#### **3.5.1 Dependent variables**

The two dependent variables, Change in share price and Share price, are used to determine the relationship with independent variables and have been calculated on an annual basis, using data for the companies as stated earlier in the healthcare sector as listed on the JSE as at February 2011, for the period 2006 to 2010. The results from the highly correlated relationships can be used as a tool for managing capital structure effectively to ensure maximal value creation for shareholders.

##### *3.5.1.1 Change in share price*

The value for the Change in share price of all the individual companies in the healthcare sector for each year have been calculated and serves as one of the dependent variables.

$$\begin{aligned} \text{Change in share price} &= \text{JSE price of company at current year end less} \\ &\text{JSE price of company at previous year end} \end{aligned} \quad (\text{Eq.3.1})$$

### 3.5.1.2 Share price

The value for the average Share price of all the individual companies in the healthcare sector for each year have been calculated and serves as the other dependent variable.

$$\begin{aligned} \text{Average share price per year per company} &= \text{The average share price for} \\ &\text{the month in which the financial year ends of the particular company.} \end{aligned} \quad (\text{Eq.3.2})$$

## 3.5.2 Independent variables

### 3.5.2.1 Net operating profit after taxes (NOPAT)

NOPAT shows to the profit remaining after taxes should a company not have debt and not have investments in non-operating assets. Using the after-tax profit is a more accurate measure of operating performance than net income, because it excludes the effects of financial decisions (Brigham & Ehrhardt, 2002:118). NOPAT is defined as:

$$\text{NOPAT} = \text{EBIT}(1-T) \quad (\text{Eq.3.3})$$

### 3.5.2.2 Earnings before interest and taxes (EBIT)

EBIT is an indicator of a company's profitability, calculated as revenue minus expenses, excluding tax and interest. EBIT is known by many names; operating earnings, operating profit and operating income. Another synonym for EBIT is Profit before interest and taxes (PBIT), and equals Net income with interest and taxes added back to it. It is concluded that EBIT is all profits before taking into account interest payments and income taxes.

EBIT can be calculated as follows (Investopedia, 2011a):

$$\text{EBIT} = \text{Revenue} - \text{Operating Expenses} \quad (\text{Eq.3.4})$$

### 3.5.2.3 Cost of sales (COS)

COS or COGS (cost of goods sold) is the direct costs attributable to the production of the goods sold by a company. The COS includes the cost of the materials used in creating the goods along with the direct labour costs used to produce the goods, but it excludes indirect expenses such as distribution costs and sales force costs (Revenue - COS = Gross margin) (Investopedia, 2011b).

$$\text{COS} = \text{Beginning inventory for the period} + \text{Total amount of purchases made during the period} - \text{Ending inventory.} \quad (\text{Eq.3.5})$$

### 3.5.2.4 Weighted average cost of capital (WACC)

WACC is often used internally by company directors to determine the economic feasibility of expansion opportunities and mergers. Please refer to paragraph 2.7.4 in chapter 2 for a detailed discussion of WACC. WACC is defined as:

$$\text{WACC} = (w_d)(r_d)(1 - T) + (w_{ps})(r_{ps}) + (w_s)(r_s) \quad (\text{Eq.3.6})$$

### 3.5.2.5 Return on equity (ROE)

The Du Pont equation is used to define relationships between profit margin, total asset turnover and change in financial leverage. Return on equity is used by the Du Pont equation as the final indicator of success. The Du Pont system can be utilised as a management tool to analyse ways of improving performance. The Du Pont variables' definitions are as follow:

$$\text{Net profit margin} = \text{Net income} \div \text{Sales} \quad (\text{Eq.3.7})$$

$$\text{Total asset turnover} = \text{Sales} \div \text{Total assets} \quad (\text{Eq.3.8})$$

$$\text{Equity multiplier} = \text{Total assets} \div \text{Common equity} \quad (\text{Eq.3.9})$$

$$\begin{aligned} \text{Return on assets} &= \text{Net profit margin} \times \text{Total asset turnover} && (\text{Eq.3.10}) \\ &= \text{Net income} \div \text{Total assets} \end{aligned}$$

$$\text{Return on equity} = \text{Net income} \div \text{Common equity} \quad (\text{Eq.3.11})$$

Brigham and Ehrhardt (2002: 461) states that if a company had been financed only with common equity, the rate of return on assets (ROA) and the return on equity (ROE) would be the same. This will be the case because the total assets would equal the common equity. It is also generally accepted that operating profitability always has a positive effect on the value of a firm - the higher the better. (Remembering that operating profitability measures the after-tax profit per rand value unit of sales).

#### 3.5.2.6 *Return on assets (ROA)*

As discussed above (equation 3.10):

$$\begin{aligned} \text{Return on assets} &= \text{Net profit margin} \times \text{Total asset turnover} \\ &= \text{Net income} \div \text{Total assets} \end{aligned}$$

#### 3.5.2.7 *Debt to equity ratio (D:E)*

The D:E ratio is a measure of a company's financial leverage and is often what is referred to when talking about a company's capital structure. It indicates the proportion of equity and debt the company is using to finance its assets (Investopedia, 2011c).

$$\text{D:E ratio} = \text{Total liabilities} \div \text{Shareholders equity} \quad (\text{Eq.3.12})$$

Note: Sometimes only interest-bearing, long term debt is used instead of total liabilities in the calculation. It is not the case with this research.

Companies with high debt to equity ratios have generally been aggressive in financing its growth with debt. Volatile earnings can be the consequence of such a decision due to the additional interest expense.

When a company uses debt to expand operations the company should keep in mind that the added income (due to the expansion) should outweigh the risks. The risks would be increased cost of capital due to interest and the increased risk of bankruptcy.

The industry in which the company operates has an influence on the debt to equity ratio. For example, capital-intensive industries such as auto manufacturing tend to have a debt to equity ratio above 2, while personal computer companies have a debt to equity ratio of under 0.5. The optimal debt to equity ratio for a firm is that which maximizes the company's value by having the lowest WACC while simultaneously keeping the risk of bankruptcy low (Investopedia, 2011d).

#### 3.5.2.8 *Return on invested capital (ROIC)*

ROIC is used to determine a firm's success at allocating the capital under the firm's control to profitable investments. Please see chapter 2, paragraph 2.7.5.3 for a detailed discussion of ROIC. ROIC is defined as:

$$\text{ROIC} = \text{NOPAT} \div \text{Operating Capital} \quad (\text{Eq.3.13})$$

#### 3.5.2.9 *Book value per share (BV/S)*

Book value per share is an indication of the residual value remaining for common shareholders after all assets are liquidated and all debtors have been paid in the case of a company having to dissolve or be liquidated. It is deemed a measure of the level of safety associated with each individual share after all debts are paid accordingly (Investopedia, 2011e).

$$\text{Book value per share} = \frac{(\text{Total shareholder equity} - \text{Preferred equity})}{\text{Total outstanding shares}} \quad (\text{Eq.3.14})$$

#### 3.5.2.10 *Cash flow per share (CF/S)*

Some of the greatest investors of all time believe that cash flow per share is a more reliable measure than earnings per share of the financial strength of a company due to the fact that cash flow per share is more difficult to manipulate. Cash flow per share is also an indication of the sustainability of the business model of the company. Cash flow per share is calculated as follows (Investopedia, 2011f):

$$(\text{Eq.3.15})$$

Cash flow per share = (Operating Cash Flow – Preferred dividends) ÷ common shares outstanding

#### 3.5.2.11 Cash flow interest cover (CF int cov)

The Cash flow interest cover is also known as the Cash flow interest coverage ratio. This ratio refers to the firm's ability to use its cash flow to satisfy its fixed financing obligations. The higher the number, the stronger the company is likely to be. The formula for this ratio is (Qfinance, 2009):

$$\text{Cash flow interest coverage ratio} = \frac{\text{Operating cash flow} + \text{Interest} + \text{Taxes}}{\text{Interest}} \quad (\text{Eq.3.16})$$

#### 3.5.2.12 Price per book value (P/BV)

The P/BV is also known as the Price to book ratio or the Price to equity ratio. The price to book ratio is used to compare a share's market value to its book value. Plainly put, this ratio gives an idea to the investor of whether he will be paying too much for what would be left if the company went bankrupt immediately.

A lower P/BV could mean that the stock is undervalued. Beware that it could also mean that something is truly fundamentally wrong with the company. Please take note that this ratio, as is the case with most other ratios, varies by industry.

The P/BV formula is known as (Investopedia, 2011g):

$$\text{P/BV} = \frac{\text{Share price}}{\text{Total Assets} - (\text{Intangible assets} + \text{Liabilities})} \quad (\text{Eq.3.17})$$

#### Where:

Share price = Current closing price of the share.

#### 3.5.2.13 Price per cash flow (P/CF)

Keeping in mind that analysts evaluate more than just the Price/Cash flow and Price/Earnings ratios, these still give an indication of the potential growth and risk of the

company. For example if the Price/Cash flow ratio would be less than the industry average it would be an indication of the company's future growth being less than the average, the risk of the particular company being higher than the industry or both (Brigham & Erhardt, 2002: 87). The Price/Cash flow is calculated as:

$$\text{Price per cash flow} = \text{Price per share} \div \text{Cash flow per share} \quad (\text{Eq.3.18})$$

Where:

$$\text{Cash flow per share} = (\text{Net income} + \text{depreciation and amortization}) \div \text{common shares outstanding}$$

#### 3.5.2.14 Price per earnings (P/E)

The Price/Earnings ratio is an indication of the price in rand investors are willing to pay per rand of reported profits. The ratio is calculated as follows:

$$\text{Price per earnings} = \text{Price per share} \div \text{Earnings per share} \quad (\text{Eq.3.19})$$

This ratio is higher for firms with strong growth prospects, other factors held constant but it is lower for riskier firms (Brigham & Ehrhardt, 2002: 87).

#### 3.5.2.15 Price per net asset value (P/NAV)

The P/NAV ratio expresses the share price as a factor of the net asset value (NAV) per share. A ratio of 1 means the NAV per share is equal to the share price. If the ratio is less than 1 the share is said to be trading at a discount to NAV, and if the ratio is greater than 1 the share is said to be trading at a premium to NAV. The NAV per share gives an indication of the market's confidence in the company and refers to the per share value of shareholders' funds including retained reserves. The higher the NAV the higher the market confidence in the company and vice versa.

The calculation of P/NAV will be (ShareDataOnline, 2012):

$$\begin{aligned}
 P/NAV &= \text{Share price} \div \text{NAV per share} && (\text{Eq.3.20}) \\
 &= \text{Share price} \div [(\text{Ordinary shareholders' equity} \div \text{number} \\
 &\quad \text{of shares in issue}) \times 100]
 \end{aligned}$$

### 3.5.2.16 Economic value added (EVA)

Economic value added is a variant of the Net present value (NPV) analysis or more generically, Shareholder value added. EVA utilises the same basic cash flows of NPV and looks at the economics of an investment "one year at a time", where NPV evaluates the incremental net cash inflows over the investment's life (discounted to the present at the firm's cost of capital) to the net cash outflows required by the investment (Megginson *et al.*, 2010:244). Economic value added is a registered trademark of Stern Stewart & Company as mentioned before in this paper. EVA is based on the century-old idea of economic profit used by economists which refers to how much profit a firm earns relative to a competitive rate of return. To illustrate; if a firm earns zero economic profit then its accounting profits are positive and just sufficient to satisfy the returns required by the investors of the firm (Megginson *et al.*, 2010:243). To calculate EVA for a particular year:

$$\text{EVA} = \text{Cash flow} - (\text{Cost of capital} \times \text{Invested capital}) \quad (\text{Eq.3.21})$$

### 3.5.2.17 Free cash flow (FCF)

Free cash flow is known as the cash remaining for distribution to investors. Due to the value of a firm mainly depending on its expected future free cash flows, managers can increase the value of companies by increasing free cash flows (Brigham & Ehrhardt, 2002:107). FCF is calculated as follows:

$$\text{Free cash flow} = (\text{NOPAT} + \text{depreciation}) - \text{Net investment in operating capital} \quad (\text{Eq.3.22})$$

Multiple regression models per year for each of the two dependent variables have been calculated after having calculated the above independent variables.

### 3.6 DETERMINATION OF THE MULTIPLE REGRESSION MODELS

The regression models have been determined after the financial data was adjusted by eliminating the abnormally high and low values with the objective to prevent these values to distort the results. (Abnormally being interpreted as: out of range compared to the rest of the data). Statistical software has been used to determine the regression models and will be summarised in Table 3.1 and Table 3.2. Two multiple regression tables have been compiled; one for each of the dependent variables, Share price and Change in Share price. The multiple regression considers all the independent explanatory variables that have correlated positively with the specific dependent variable.

The regression coefficients in the regression equations give an indication of the strength of the correlation between the independent and the dependent variable for the Share price and Change in Share price.

The adjusted  $R^2$  is calculated to determine what percentage of variation in the two dependent variables (Y) can be explained by the multiple regression model.

#### 3.6.1 Multiple regression model

Multiple linear regression uses more than one explanatory variable to predict a single dependent variable. The general statistical multiple regression model with  $k$  independent variables is:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_k X_{ki} + \varepsilon \quad (\text{Eq. 3.23})$$

Where:

- $\beta_0$  = Y intercept
- $\beta_1$  = Slope of Y with variable  $X_1$  hold variables  $X_2, X_3, \dots, X_k$  constant
- $\beta_2$  = Slope of Y with variable  $X_2$  hold variables  $X_1, X_3, \dots, X_k$  constant
- $\beta_3$  = Slope of Y with variable  $X_3$  hold variables  $X_1, X_2, \dots, X_k$  constant
- $\beta_k$  = Slope of Y with variable  $X_k$  hold variables  $X_1, X_2, X_3, \dots, X_{k-1}$  constant
- $\varepsilon_i$  = Random error in Y for observation  $i$

Beta ( $\beta$ ) in the general model (equation 3.23) is also referred to as the coefficient.

The multiple regression model has been used in this paper to explain the Share price and Change in Share price using a number of explanatory variables such as NOPAT, EBIT, COS, WACC and others.

### 3.7 RESULTS: MULTIPLE REGRESSION – ALL EXPLANATORY VARIABLES

The results are obtained from the statistical data analysis done for each year from 2006 to 2010 for each of the dependent variables. The value of the various coefficients have been determined by doing the multiple regression analysis. The value of the multiple regression analysis lie also in the fact that it is used to determine the relevance of the model and to determine the proportion of the total variation in the observed values of (Y), Share price and Change in share price.

#### 3.7.1 Share price: Multiple regression models – all explanatory variables

The multiple regression equations and coefficients of multiple determinations (adjusted R<sup>2</sup>) for all the explanatory variables that correlate with the Share price for each of the years (2006 - 2010) are listed in table 3.1.

**Table 3.1** Share price: All variables multiple regression and adjusted R<sup>2</sup>.

Year	Multiple Regression Equation	Adjusted R <sup>2</sup>
2006	Share price (Y) = 104.8383 + 13.0706 (CF/Share)	0.9351
2007	Share price (Y) = -168.37 + 0.004 (NOPAT)	0.9340
2008	Share price (Y) = 1578.64 + 30.04(ROIC)	0.8631
2009	Share price (Y) = 61.6365 + 6.7668 (ROE) + 69.7777 (P/E)	0.7440
2010	Share price (Y) = 289.4484 + 0.0024 (NOPAT)	0.7440

Source: Own

##### 3.7.1.1 Share price: Discussion of regression equations

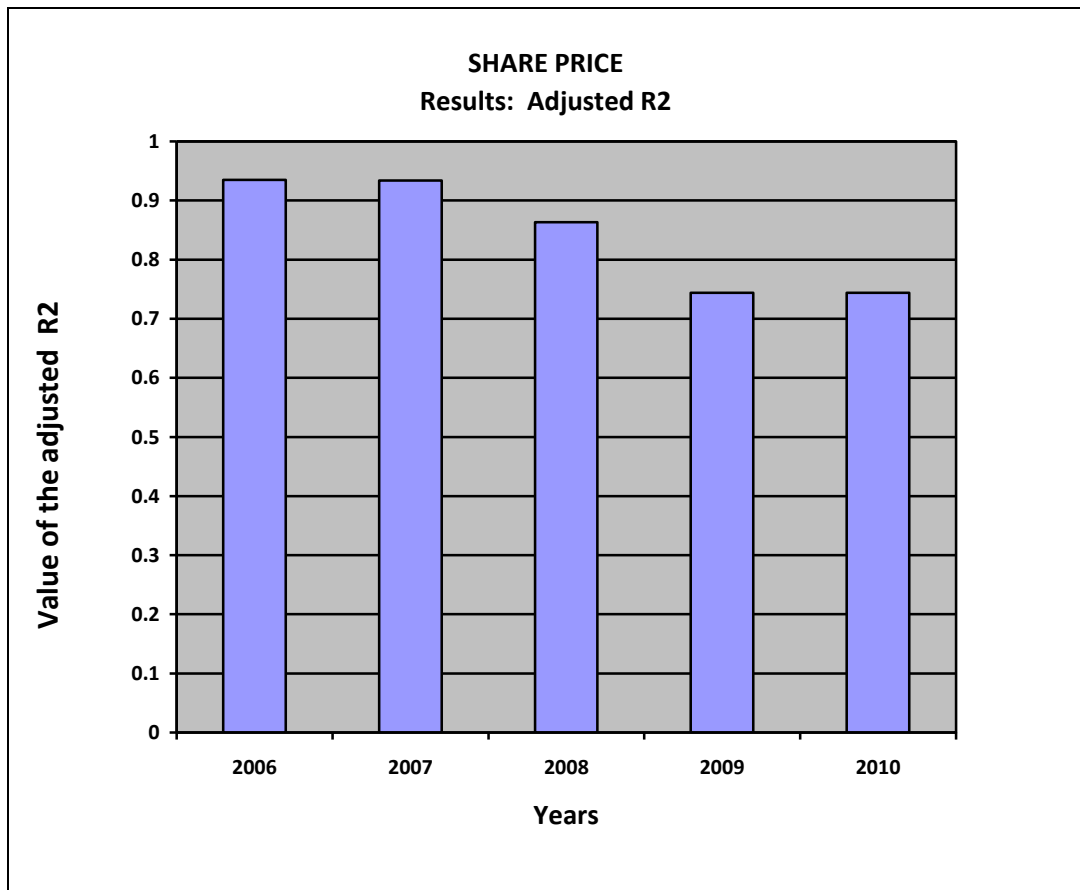
The 2006 regression model as indicated in table 3.1 is used an example to discuss the meaning of the regression equation for Share price:

$$\text{Share price (Y)} = 104.8383 + 13.0706 (\text{CF/Share})$$

The coefficient of Cash flow per share (CF/Share), calculated as 13.0706, means that, for a given amount of Cash flow per share, the expected Share price is estimated to change by R13.0706 per year for every R1 change in Cash flow per share. The positive coefficient of Cash flow per share indicates that this variable is expected to move in the same direction as the Share price.

Should the dependent variable (Y) increase for every increase in the independent variable, it translates to the two variables being positively correlated. If the dependent variable (Y) decreases for every increase in the independent variable, it translates to the two variables being negatively correlated.

### 3.7.2 Share price: Results of the multiple coefficient of determination



**Figure 3.1** Share price: All variables adjusted R<sup>2</sup>.

(Source: Own).

Figure 3.1 indicates a high overall adjusted  $R^2$  for all of the years under investigation. The years 2006 and 2007 can be considered to have the most significant (highest above 77%) predictability of the Share price explained by the considered independent variables. According to this fact, it would seem to make the development of a model based on the Change in Share price related variables as indicators of Share price virtually impossible (for 2006 and 2007). The models for 2006 - 2010 have been included due to the small data pool available.

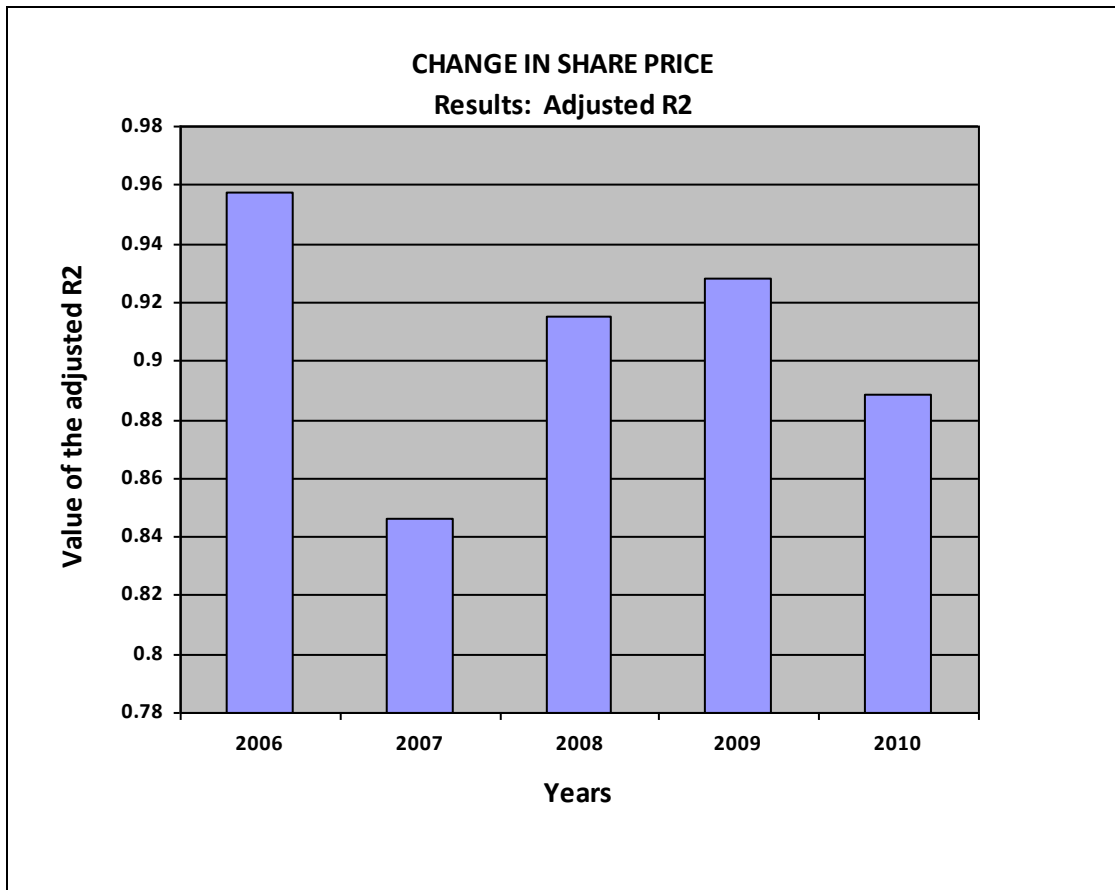
### 3.7.3 Change in share price: Multiple regression models - all explanatory variables

Table 3.2 shows all the multiple regression equations and coefficients of multiple determinations (adjusted  $R^2$ ) for all the explanatory variables that are highly correlated with Change in share price for each of the years (2006 – 2010) for JSE listed companies in the healthcare sector.

**Table 3.2** Change in share price: All variables multiple regression and adjusted  $R^2$

Year	Multiple Regression Equation	Adjusted R2
2006	Change in share price (Y) = 219.8130 + 31.4062 (ROA)	0.9575
2007	Change in share price (Y) = 1628.0440 -120.4080 (Price/CF)	0.8465
2008	Change in share price (Y) = 137.3851 + 82.0407 (D:E) – 46.6182 (Price/NAV)	0.9149
2009	Change in share price (Y) = 19.0766 – 17.4246 (Price/BV)	0.9282
2010	Change in share price (Y) = 422.2090 – 326.6920 (Price/NAV) + 160.8130 (D:E) + 25.512 (CF int cov)	0.8882

Source: Own



**Figure 3.2** Change in share price: All variables adjusted  $R^2$   
(Source: Own).

Figure 3.2 shows the values of the multiple coefficient of determination of the various models for Change in share price. It is clear from the graph that all the regression models have a significant predictability in Change in share price. The lowest value on the graph namely 0.8465 for 2007 is still significant as it explains 84.6% of the total variation of the Change in share price. All the regression models have thus been included.

### 3.7.4 Results of the criteria identified by the multiple regression – all explanatory variables

Table 3.3 and Table 3.4 indicate the number of times each independent variable appears as an explanatory variable for the dependent variables Share price and Change in share price for the period 2006 - 2010. Each table represents all the explanatory variables considered within a specific year. The adjusted  $R^2$  included in the tables below for the period 2006 - 2010 is the calculated adjusted  $R^2$  for the model derived for the specific year.

**Table 3.3** Share price: All variables appearances per year.

Independent variables	2006	2007	2008	2009	2010	Count
Adjusted R <sup>2</sup>	0.9351	0.9340	0.8631	0.7440	0.7740	
NOPAT		X		X	X	3
EBIT		X				1
COS			X			1
WACC	X					1
ROE	X			X		2
ROA	X		X			2
D:E	X			X		2
ROIC	X		X			2
BV/S						0
CF/S	X		X			2
CF int cov			X			1
Price/BV	X				X	2
Price/CF			X			1
P:E		X	X			2
Price/NAV	X			X	X	3
EVA						0
FCF	X					1

Source: Own.

Table 3.3 shows that only NOPAT and Price/NAV appear three times as an explanatory variable of the Share price. ROE, ROA, D:E, ROIC, CF/S, Price/BV and P:E appears only twice for the period 2006 - 2010. It is highly surprising that FCF only appears once from 2006 – 2010 as explanatory variable of the Share price. The high adjusted R<sup>2</sup> in table 3.3 (especially 2006 - 2008) lead to a situation of high predictability.

**Table 3.4** Change in share price: All variables appearances per year.

Independent variables	2006	2007	2008	2009	2010	Count
Adjusted R <sup>2</sup>	0.9575	0.8465	0.9149	0.9282	0.8882	
NOPAT				X		1

Independent variables	2006	2007	2008	2009	2010	Count
EBIT						0
COS	X			X		2
WACC	X					1
ROE	X			X		2
ROA	X					1
D:E	X		X	X		3
ROIC	X			X		2
BV/S						0
CF/S	X					1
CF int cov						0
Price/BV	X					1
Price/CF						0
P:E						0
Price/NAV	X			X		2
EVA			X	X		2
FCF	X	X				2

Source: Own

Table 3.4 shows that D:E appears three times in five years as an explanatory variable of Change in share price. The Change in share price models in Table 3.4 (2006 - 2010), like for Share price, have high adjusted  $R^2$  values and also indicate high predictability. When looking at the values of the  $R^2$ 's, the Change in share price models seem to have the highest values which would indicate that Change in share price would be a better predictor for shareholder wealth creation than just Share price.

### 3.7.5 Results of the model criteria – all explanatory variables

From Table 3.3 it is clear that NOPAT and Price/NAV are the two most represented criteria with regards to Share price.

From Table 3.4 only D:E is the most representing criteria with regards to Change in share price. The Change in share price has the highest  $R^2$ 's and therefore I would advocate that

Change in share price would be a better predictor of the wealth created for shareholders than Share price but on the other hand more variables can be included to predict the Share price than the Change in share price and this would render the Share price a more successful predictor of the wealth created.

Taking into consideration that the wholesale medicine pricing structure was changed at the end of 2005 (FMF, 2006) impacting on the financials of 2006 and the recession that was felt since the beginning of 2008 until mid 2009 (Arieff et al., 2010; Davies, 2012), it could be interpreted in this case that during a time of recession the Change in share price rather than the Share price should indicate the wealth created for shareholders. This is concluded due to the adjusted  $R^2$ 's of the Change in share price being higher than that of the Share price, keeping in mind that NOPAT and Price/NAV highly represents Share price and D:E highly represents Change in share price.

Interestingly, looking at Figure 3.1 and Figure 3.2 the adjusted  $R^2$  values are linearly related but the inverse of each other during 2007 to 2009 (time of economic downturn). In Figure 3.1 the values of the adjusted  $R^2$ 's for Share price declines (mildly negative slope) from 2007 until 2009 and in graph 3.2 the values of the adjusted  $R^2$ 's for Change in share price increase (strongly positive slope).

If Table 3.3 and Table 3.4 should be reconstructed only to include the years 2007 to 2009, Table 3.3 for Share price and the independent variables that have the highest occurrence in the three years would be NOPAT and P:E and Table 3.4 for Change in share price would be D:E and EVA.

Not losing sight of the fact the small data pool is a very real limitation in this empiric study it can be concluded that during times of economic downturn Change in share price should be well managed and could be monitored by strictly managing the D:E and EVA according to company policy. (Note that D:E also had high predictability relating to Change in share price when all the five years 2006 - 2010 was used to observe the highest count).

### **3.8 MULTIPLE REGRESSION AT A 5% LEVEL OF SIGNIFICANCE**

The data was not run through the statistical program again at a 5% level of significance as only two independent variables for Share price and only one independent variable for Change in share price was found to be representative of the respective dependent variable. The fact that the available data pool is so small is the cause for the reason not doing another run at a 5% significance level. The ideal would be to do a run at a 5% significance level which would make it possible to predict the Share price or Change in share price at a 95% confidence interval.

### **3.9 SUMMARY**

The results of the empirical study have been discussed in this chapter. The most important criteria for Share price and Change in share price have also been identified. It was brought to the reader's attention that it would've been ideal to run the most represented independent variables per dependent variable through the statistical program again at a 5% level of significance to be able to use the then most represented independent variables per Share price and Change in share price at a 95% confidence interval. Unfortunately the 5% level of significance could not be done due to the initial data pool being too small. Only the five years of financial data (2006 - 2010) are available and then only for six companies. The small data pool and few JSE listed companies is a significant shortcoming of the healthcare sector in South Africa.

It must also be noted that the success rate of the factor model increases as the number of variables included in the factor model increases (Van den Heever, 2007:90). Unfortunately only NOPAT and Price/NAV (two independent variables/factors) highly represented Share price and only D:E (one independent variable/factor) highly represented Change in share price when data from the years 2006 - 2010 were examined. When only the years of economic downturn (2007 - 2009) were examined the independent variables NOPAT and P:E were highly representative of Share price and D:E and EVA were highly representative of Change in share price. It was finally concluded that during times of economic downturn the Change in share price should be monitored closely and could be done by managing the D:E ratio and EVA well.

It is noted once again that the results of this empiric study should thus be used with caution due to the small data pool.

## CHAPTER 4

### CONCLUSION AND RECOMMENDATIONS

#### 4.1 GENERAL CONCLUSIONS

A company's capital structure is of vital importance as part of the strategy to apply VBM in imperfect market conditions. The way a company manages its D:E ratio will have a profound impact on the particular company's financial risk which in return will have a great influence on the market's sentiment towards the company and per implication its share price.

Keeping in mind that investors are risk averse it would mean that investors will require a higher than market rate of return on their investment if they would be willing to bear the risk of investing in a relatively risky company. The risk-return trade-off would exactly offset the savings of substituting debt for equity in perfect market conditions. This would lead to a firm's value being unaffected by the capital structure in perfect market conditions according to the M&M Proposition I and the firm not having any net saving in the cost of capital according to the M&M Proposition II. Extending these direct conclusions it can be summarised as that the capital structure of a firm is irrelevant in the determination of the value of a firm and also in the determination of the cost of capital due to the WACC being constant. Under the circumstances of a 100% equity capital structure the required return on assets is equal to the WACC.

When looking at the same propositions of M&M in imperfect market conditions it is realised that capital structure does have an impact on firm value due to the debt tax interest shield. It was concluded in M&M Proposition II in imperfect market conditions that a levered firm does have a higher value than an unlevered firm. It was also noted that the higher a firm's non-debt tax shield, the lower its total debt should be. The required return on assets is no longer equal to WACC but makes way for the required return on debt that represents the interest rate that the firm is paying for the financing. It is now known that the levered firm's WACC will be lower than for the unlevered firm.

The idea of balancing the amount of debt to be incorporated into the capital structure with the risk and cost of financial distress was introduced by Jensen and Meckling in 1976 and it was proposed that the optimal D:E ratio would maximise the firm value. This is known

as the trade-off theory. The pecking order theory and the signaling model assist in deciding on which financing sources to use, in order of preference.

Although the afore-mentioned M&M propositions and other theories are kept in mind when deciding on a capital structure, certain factors like the tax shield and non-debt tax shield, the profitability of the firm and the income variability as well as the availability of trade credit should also be assessed as part of the decision. Limitations to borrowing and the size, growth opportunities, age and business risk of the firm as well as the financial risk and management's attitudes should be taken note of as well.

It was then concluded that in order to apply VBM the managers should aim to build firm value and not firm profitability as popularly believed. In closing of the literature study chapter it was concluded that firm value primarily depends on its expected future FCF and that per implication VBM can be interpreted as a management style that aims to increase FCF.

From the above it is clear why VBM practising firms are being managed according to a dynamic target capital structure rather than a rigid capital structure.

The aims of this empirical study were divided into primary and secondary objectives. The primary objective was *to determine whether a management framework can be developed to manage capital structure for optimal value creation for companies listed under the healthcare sector as listed on the JSE*. According to the results of this empirical study it can be recommended that especially during times of economic downturn, Change in share price should be optimally managed. To manage Change in share price well, attention needs to be given to the strict management of the D:E ratio and EVA. These two factors should be kept well within the applicable range of the specific industry that the company is trading in.

The secondary objectives were listed as:

- 1) *To determine whether a linear relationship exists between sustainable value creation and optimal capital structure*. From this research it is clear that there is a linear relationship between sustainable value creation and optimal capital structure due to the fact that regression analysis could be done. The intensity of the relationship (the slope of the regression line), though, is not reliable as a

conclusion from this research due to the previously stated shortcomings of the data. Sustainable share holder wealth creation would be positively related to the optimisation of the D:E ratio and EVA.

- 2) *To establish what the range of an optimal capital structure would be for a company in the healthcare sector.* Unfortunately this objective was not satisfied. With a bigger data pool one should be able to perform the necessary statistical calculations to satisfy this objective reliably.
- 3) *To determine to what extent an optimal capital structure contributes to building sustainable value (determining if it is a significant contribution).* Sustainable value creation was represented by the measurements of Share price and Change in share price. This objective could not be reliably satisfied within the given circumstances as mentioned above.

In Chapter 3 historical financial data standardised according to the McGregor BFA database and the JSE database was used. Data for the healthcare sector was used and unfortunately only a total of six companies were listed on the JSE in this sector as at February 2011. Obviously all six of the companies were included in the data. Data from 2006 to 2010 was included in the research. The year 2006 was chosen due to fact that it was the year of South African change in wholesale medicine pricing which could have an influence on the FCF of the pharmaceutical suppliers.

Change in share price and Share price were presented as the dependent variables representing the sustainable shareholder wealth and the independent variables, that was thought to have an impact on shareholder wealth, were presented as NOPAT, EBIT, COS, WACC, ROE, ROA, D:E, ROIC, BV/S, CF/S, CF int cov, Price/BV, Price/CF, P:E, Price/NAV, EVA and FCF.

The data was analysed using multiple regression and stepwise forward regression. The conclusion from the empirical study for 2006 – 2010 was that NOPAT and Price/NAV highly represented Share price and only D:E ratio highly represented Change in share price. When only the years of economic downturn (2007 – 2009) were examined NOPAT and P:E ratio was highly representative of Share price and D:E ratio and EVA were highly representative of Change in share price. It was finally concluded that during times of

economic downturn, Change in share price should be monitored closely and could be done by managing the D:E ratio and EVA within the industry applicable ranges.

## **4.2 RECOMMENDATIONS FOR FURTHER RESEARCH**

A recommendation for further research would be to investigate why Change in share price gives a better indication of value creation during times of economic downturn instead of Share price.

Another recommendation would also be to expand the historical financial data to before 2006 and include it into the research to see if the same results could be obtained on a larger data pool.

A third recommendation would be to do further research on the larger data pool to satisfy the unreached objectives, being to establish what the range of an optimal capital structure would be for a company in the healthcare sector and to determine to what extent an optimal capital structure contributes to building sustainable value.

A fourth recommendation for further study not related to capital structure though, is to research why so few companies are listed on the JSE in the healthcare sector in South Africa, and to determine why the healthcare companies prefer not to be trading as publicly owned companies.

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*\*Note: References in text with no page numbers are internet resources or personal interviews, indicated above.*