THE DETERMINANT OF A FIRM OPTIMUM CAPITAL STRUCTURE: *CONCEPTUAL AND THEORETICAL OVERVIEW*

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Abstract

This paper provides a conceptual and theoretical overview of the determinant of optimum (if any) capital structure (Debt-equity mix) of a corporate entity. The contributions made by well-known finance researchers in capital structure like David Durand, Solomon Ezra, Stephen Ross, Modigliani, Miller etc. is highlighted so that readers can have an idea of what the existing theories in this contentious aspect of finance are. There have been a lot of controversies and conflicting issues about the existence of an Optimum Capital Structure. An Optimum Capital Structure exists where the value of the firm is maximized and the cost of capital is minimized. This is not generally accepted by all, while Net Income School and some traditionalist uphold the relevance of the Capital Structure theory, the Net Operating Income School and the M-M Hypothesis support the irrelevance of this theory. We also found out that the Optimal Capital Structure is 100 percent debt financing, which is not tenable empirically. The great deal of flexibility in choosing a financial structure enables corporate entities to engage in capital restructuring by changing their debt-equity ratio continually depending on the prevailing conditions (especially operating environments) in which they find themselves so as to maximize their values and minimize their costs. This paper therefore, recommends that an optimal capital structure exists for all firms. Firms should make use of debt to the point where the tax benefit from such debt is exactly equal to the cost that comes from the increased probability of financial distress.

Introduction

The two major forms of external financing available to any firm or corporate entity is *debt* and *equity.* Firms have a great deal of flexibility in choosing any combination of both, the question of whether one combination or structure is better than any other for a particular firm is the heart of the capital structure theory. Although both equity and debt represent sources of fund to the corporation, they have certain characteristic differences.

The classical objective of the firm is the maximization of its value from time to time, hence the capital structure or financing decision should be directed toward this singular purpose. Since the value of the firm is affected by this crucial decision, it is essential for the firm to have a preferential combination of debt and equity that maximizes such value.

The relationship between capital structure and firm value has been the subject of considerable debate, both theoretically and in empirical research. There exist conflicting theories on the relationship between capital structure and the value of the firm. If leverage (debt) affects the firm's cost of capital and value because of its continuous usage as a major and cheaper source of fund, then there should be an optimum capital structure that will maximize the value of the firm and minimize its weighted average cost of capital. Throughout the literature, debate has centered on whether there is an optimal capital structure for an individual firm or whether the proportion of debt usage is irrelevant to the individual firm's value. (Harris and Raviv, 1991).

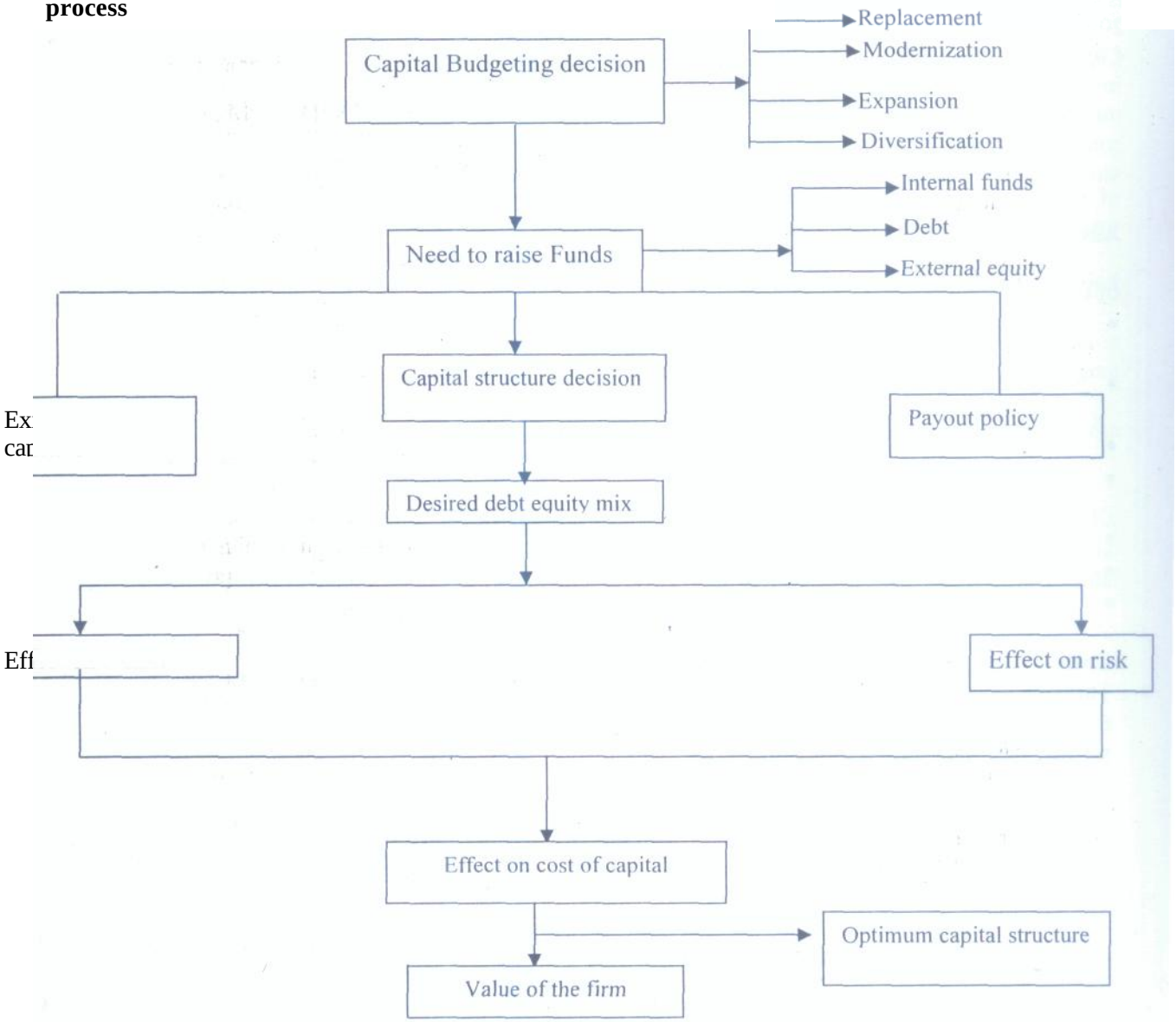
Modigliani and Miller (1958), demonstrated that in a frictionless world, financial leverage is unrelated to firm value, but in a world with tax-deductible interest payments, firm value and capital structure are positively related. Miller (1977), added personal taxes to the analysis and demonstrated that optimal debt usage occurs at macro level, but it does not exist at the firm level. Other researchers have added imperfections, such as bankruptcy costs (Sliglitz, 1972), agency costs (Jensen and Meckling, 1976) and gains from leverage - induced tax-shields (DeAngelo and Macula's, 1980) to the analysis and have maintained that an optimal capital structure may exist.

Despite these large bodies of theoretical literature, about corporate capital structure, research produced so far did not provide yet a sound basis for establishing in a decisive fashion, the empirical validity of the different theoretical models. With respect to the contention surrounding the capital

structure theory, Myers (1984), calls it a *"Puzzle'";* Stiglitz (1989) calls it *a "'dilemma'"*, the Economist suggested that it is a *"mystery"*, and Kamath (1997), calls it an *"enigma"*. It therefore, appears that we are still lacking a comprehensive theory to explain how firms decide about their capital structure mix, and we still cannot unambiguously specify the relationship between capital structure choice and firm value. However, since the fundamental work of Modigliani and Miller (1958), a number of authors extended their irrelevance theory. However, what optimal mix of equities and debts to maximize a firm value still remains undetermined.

Conceptual Issues

Capital Structure: This is defined as the proportionate relationship between debt and equity (Pandey, 1999). It is refered to as the debt-equity mix or ratio. The combination of owner's funds (equity) and creditor's funds (debt) in the financial structure of a firm. A firm's capital structure (or financial structure) is the specific mixture of long-term debt and equity the firm uses to finance its operations (Ross, Westerfield and Jordan, 2000). What mixture of debt and equity is best? The mixture chosen will affect both the cost of capital, the risk and the value of the firms. The process of capital structure decision is shown in figure 1 below: **Figure I: The capital structure decision process**



Source: Pandey, I..M. (1999:634)

Financial Leverage: This refers to the use of the fixed charges sources of funds such as debt and preference capital along with the owners' equity in the capital structure (Pandey, 1999). Financial leverage (or gearing) is the use of fixed interest sources of long-term funds in the capital structure of a company (Olowe, 1997). The great deal of flexibility in choosing a financial structure allowed firms to use more of long-term debt than equity in order to get the best combination possible. The reason for this is due to the cheapness of debt capital as compared to equity capital; because the treatment of interest payments as tax deductible expenses lower cost substantially. However, a firm can only use a given amount of debt financing because of the risk and fixed payment associated with it (Unugbro, 2006).

Cost of Capital: This is the cost of funds raised by a firm and the returns expected by investors that put funds into the firm. It is the minimum return that a company ought to make on its own investments to earn the cashflows out of which investors can be paid their returns. The firm's overall cost of capital is a weighted average of the costs of the various components of the firm's capital structure. One significant issue to be explored in this paper is what happens to the cost of capital when we vary the amount of debt financing or the debt-equity ratio. The primary reason for studying the weighted average cost of capital (WACC) is that the value of the firm is maximized when the WACC is minimized because firm's values and its cost of capital moves in opposite directions (Ross *et al*, 2000).

Capital Restructuring: This refers to activities that alter the firms existing capital structure. It involves substituting one capital structure for another while leaving the firm's asset unchanged. As the management so desired, a firm could issue some debt instruments and use the proceeds to buy back some stock thereby increasing the debt-equity ratio. Alternatively, the firm could also issue some stock and use the money to pay off some debt, thereby reducing the debt equity ratio.

Assumptions Underlying Capital Structure Theory

To understand properly the elements of the capital structure and the value of the firm or the cost of capital controversy, the following assumptions will be made: (Van Home, 1985).

- Firms employ only two types of capital: Debt and equity and the value of the firm is equal to the sum of debt and equity.
- The total assets of firm are given: The degree of leverage can be changed by selling debt to repurchase shares or selling shares to retire debt i.e capital restructuring
- The firm has a policy of paying 100 percent dividends: No retained earning
- Investors have the same subjective probability distribution of expected future operating earning for a given firm.
- The operating earnings of the firm are not expected to grow:
- The business risk is constant and independent of capital structure.
- There are no taxes and bankruptcy cost. This assumption is relaxed later on.

Controversy and Diversity of Thoughts on Capital Structure

There are many controversies and conflicting issues surrounding the capital structure theory because the existence of an optimum capital structure is not generally accepted by all. There exist different schools of thoughts viewing the issue from different perspective. Two extreme views and a middle position have been identified (Durand, 1959). The extremists are the Net Income and Net Operating Income approach, while the traditional approach serves as an intermediate between the two extreme schools.

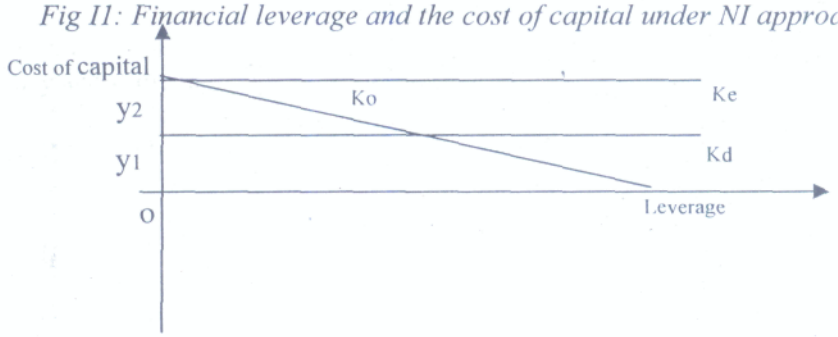
Net Income (NI) **Approach**

This approach is of the view that capital structure is relevant because leverage can affect the value of the firm and its cost of capital. A firm can increase its value or lower its overall cost of capital by increasing the proportion of debt in its capital structure. This approach is based on the assumption that (a) the cost of debt (kd) and the cost of equity (ke) remain constant with an increase in leverage or debt, (b) the cost of debt (kd) is less than the cost of equity (ke). The constant Kd and Ke implies that the increased use of debt by increasing shareholder's earnings will increase the value

Since debt is a cheaper source of finance, by increasing the debt in the capital structure, the value of the firm will increase and the cost of capital will be reduced.

It is important to note that an optimum capital structure can be determine under the net income approach; and this will occur at the point where the value of the firm is maximum and the weighted average cost of capital is minimum. The figure below indicate that such optimum capital structure will occur at the point when the firm is 100 percent debt financed, which is not possible in real life practice.

Fig II: Financial leverage and the cost of capital under NI approach



Source: Olowe 1997: 365

Net Operating Income ***(Not)*** *Approach*

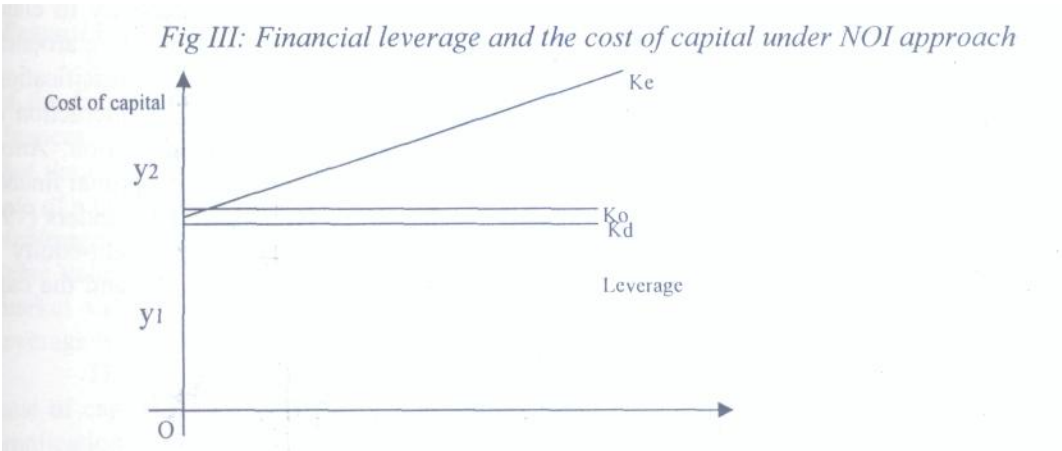
The net income approach holds that the capital structure is not relevant because changes in capital structure through increase or decrease in the value of debt does not affect the value of the firm and its cost of capital. This approach is based on the following assumptions, (a) The net operating income is capitalized at the overall cost of capital to obtain the total market value of the firm; hence the split between debt and equity is irrelevant.

(b) The weighted average cost of capital (Kd) depends on the business risk. If business risk is assumed to be constant, then overall cost of capital (Ko) is constant regardless of the degree of leverage.

(c) The cost debt (Kd) is constant regardless of the degree of leverage and is cheaper than the cost of equity (Ke). The cost of equity increase linearly with leverage.

The diagram below shows the net income approach. Ko and Kd are constant while Ke increases linearly with leverage. As the Ko is constant at any level of leverage, there is therefore no unique optimum capital structure in this approach. As the cost of capital is the same at all capital structures; every capital structure is optimum.

Fig III: Financial leverage and the cost of capital under NOI approach



Traditional Approach

The traditional approach which is a modification of the net income approach, and sometimes also regarded as the intermediate approach between Nl and NOI approach. This approach is of the view that the capital structure is relevant because there exist an optimum capital structure through the judicious use of debt and equity.

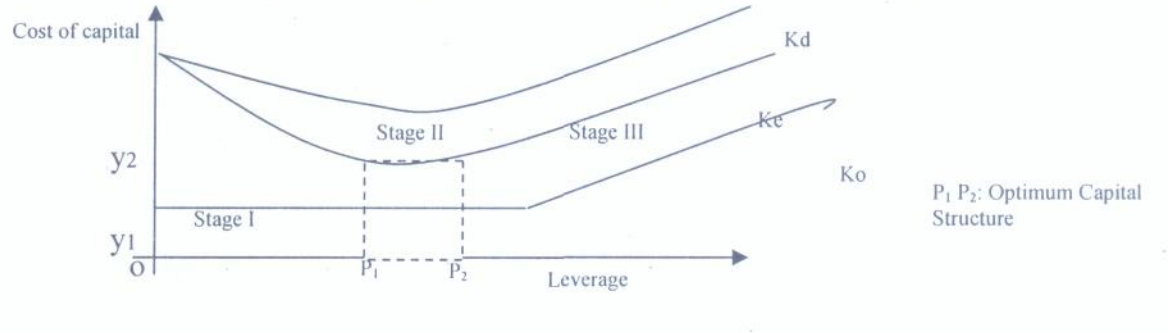
The traditional approach suggest that the value of the firm increases or the cost of capital decreases initially within a reasonable limit of debt after which further increase in debt reduces the value of the firm or increases the cost of capital. Hence an optimum capital structure exists and it occurs when the value of the firm is maximum and the cost of the capital firm is minimum. The view of the traditional approach can be describe in three stages (Olowe, 1997).

i) At the initial stage: the cost of equity is constant or rise slightly with an increase in debt. The cost of debt is constant and cheaper than cost of equity. Because of the cheapness of cost of debt, the cost of capital decreases as debt increases and the value of the firm also increases,

ii) Once the firm reaches certain degree of leverage, further increase in debt will have an insignificant effect on the cost of capital and the value of the firm. This is because the increase in the cost of equity due to the added financial risk will offset the advantage of low cost of debt. Within this range or at a specific point, the firm will attain optimum capital structure. Point P, P_2 in the figure below.

iii) Beyond the acceptable limit of leverage, the value of the firm increases or the cost of capital increases with leverage; because investors perceived a higher degree of financial risk and hence demand a higher equity rate of return which will offsets the advantage of low cost debt. The overall effect will cause the cost of capital to increase and decrease in the value of the firm.

Fig IV: Leverage and the cost of capital: Traditional approach

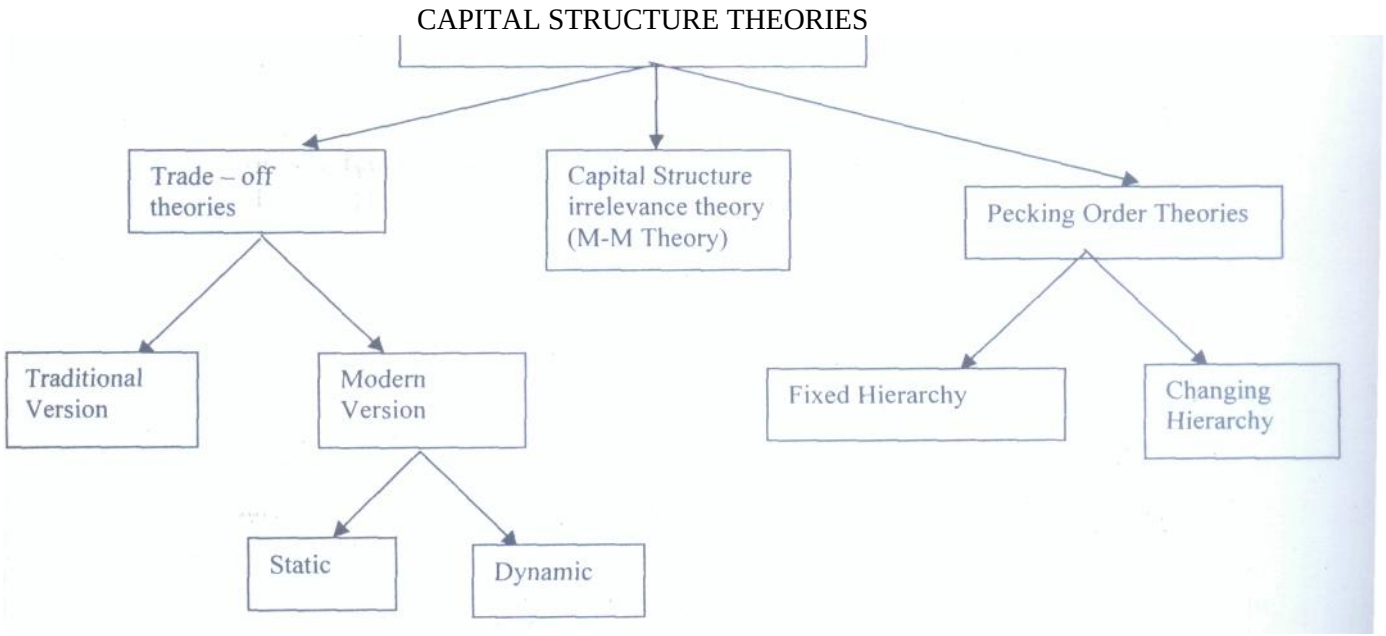


Source: Olowe 1997: 369

Capital Structure Theories

There are many competing capital structure theories, that it becomes necessary to classify them into some broad groups. Harris and Raviv (1991), organized their survey of literature around the *"driving forces'"* behind financing policy and capital structure. They came out with a classification of theories based on taxes and bankruptcy costs, agency costs, asymmetric information, interaction with input and / or product markets, and theories based on corporate control consideration. Another classification could be based on whether particular theory presumes the existence of optimal financing policy and how the theory describes it. This was one of the classification adopted by Sanders (1998), according to this classification, there are theories stating that there is an optimal debt-equity mix (trade-off theories); there is an optimal financing hierarchy (pecking order theories) and the capital structure irrelevance theory.

Figure V: Classification of capital structure theories based on implication for optimal financing policy



Source: Sanders P. *(1998: 137)*

Modigliani and Miller (M-M) **Theory**

The M-M Hypothesis provide a behavioural justification support for the net operating income approach with the view that in the absence of taxes, the cost of capital and market value of the firm remain constant throughout all degrees of leverage. Modigliani and Miller (1958), provide the foundational impulse to the study of capital structure problem by showing that under some strong assumptions (an ideal world of pure and perfect competition without taxes) the choice between debt and equity financing has no effect on a firm's values. They showed that capital structure is irrelevant to a firm's value when assets, earnings and future investment opportunities remain constant. The theory says that since financial leverage has no effect neither on the size of operating income nor on the level of business risk, then dividing the operating income into two (dividends and interests) should not affect the value of the firm. This theory became widely known as capital structure irrelevance theory. Modigliani and Miller's proposition consisted of the following closely related point.

Proposition I

M-M hypothesis that for firms in the same risk class, the total value of the firm is independent of the firm's capital structure, hence it is completely irrelevant how a firm chooses to arrange its finances. Since the market value of a firm is not affected by the capital structure, M-M then argue that the cost of capital is independent of the capital financing mix and is equal to the capitalization rate of a pure equity stream of its class. This is the position in the absence of corporate taxes. ***Arbitrage Process:*** Two firms identical in all respect except their capital structure would have the same value and cost of capital. If, not arbitrage will be possible and its occurrence will make the market values of the two firms to be the same. This will enable investors to substitute personal leverage for corporate leverage to restore equilibrium in the market.

Thus, using arbitrage process as a basis, M-M conclude that the market value of firm or its cost of capital is not affected by leverage, hence capital structure is irrelevant (Pandey, 1999). The implication of M.M proposition I with taxes is that debt financing is highly advantageous, and in the extreme, a firm's optimal capital structure is 100 percent debt financing. Also a firm's weighted average cost of capital decreases as the firm relies more heavily on debt financing.

Proposition II ,

M-M hypothesis that a firm's cost of equity capital is an increasing function of leverage (a positive linear function of the firms capital structure). The cost of equity depends on three things: *required rate of return on the firm's assets, the firm's cost of debt* and *the firm's debt-equity ratio,* hence the cost of equity rises as the firm increases its use of debt financing (Ross *etal* 2000). This means a company cannot lower its total cost of capital by issuing *"cheaper"* debt because although the debt may cost less, it increases riskiness of a firm's stock and thus its cost of equity. The benefit of the cheaper debt is exactly off-set by the higher returns demanded by equity holders, and as a result the total cost of capital remains the same. Unlike the case with proposition I, the general implications of proposition II are the same whether there are taxes or not.

Thus in a tax-free world, with the M-M theory, the weighted average cost of capital is invariant to changes in the firm's capital structure. This implies that a firm cost of capital is independent of the mix of debt and equity used in financing its operation.

Trade Off Theories

This is a combination of theories which criticize capital structure irrelevance theory by arguing that assumptions used by Modigliani and Miller, are not realistic. The trade-off theory determines an optimal capital structure by adding various imperfections, including taxes, costs of financial distress, and agency cost, but retains the assumptions of market efficiency and symmetric information. The trade-off theory of capital structure suggests that a firms target leverage is driven by three competing forces *taxes, costs of financial distress* (bankruptcy costs) and *agency costs.* The trade-off theory says that companies have optimal debt-equity ratios, which they determine by trading off the benefits of debts against its costs. In the traditional or original form of this theory, the main benefit of debt is the tax advantage of interest deducibility. The traditional view did not take into account that shareholders' required rate of return would increase as soon as financing leverage rise. The modern versions of trade-off theory are based on capital market imperfections (taxes, bankruptcy costs, agency costs) and argue that there is a trade-off between advantages and disadvantages associated with the use of debt capital. The earlier modern versions of the theory were static. The static trade-off theory of capital structure explains observed capital structures, as a static trade-off of costs and benefit of debt. This theory states that a firm borrows up to the point where the tax benefit from an extra amount of debt is exactly equal to the cost of debt that comes from the increased probability of financial distress. This theory also assumes that the firm is fixed in terms of its assets and operations while it only considers possible changes in the debt-equity ratio. There is a growing part of the literature that extends static models by introducing dynamics into the capital structure choice.

Pecking Order Theory

This theory is among the most influential theories of corporate structure. Myers (1984) opined that due to adverse selection problems, firms prefer internal to external finance. When outside funds are necessary, firms prefer debt to equity because of the lower information costs associated with debt issues. Equity is rarely issued, unless as a last resort. Suppose there are three source of funding available to firms: retained earnings, debt, and equity. On the basis of hierarchy either fixed or • changing, *retained earning* come first as an internal source with no adverse selection problem, *debt* comes next as a cheaper external source with minor adverse selection problems, while *equity* comes last because it is subject to serious adverse selection problem. Thus, from the point of view of an outside investor, equity is strictly riskier than debt; while those inside the firm preferred retained earnings as a better source of funds than debt, just as debt is a better deal than equity financing.

Fama and French (2002), also support the pecking order. They suggest that the pecking order is supported by a negative relationship between earnings and leverage. Most importantly, the pecking order theory can explain why the most profitable firms tend to borrow less; they simply do not need external funds. Less profitable firms tend to issue debt because they do not have sufficient internal funds and because debt has lower flotation and information cost compared to equity. Debt is the first source of external finance on the pecking order, equity is issued only as a last resort when the debt capacity is fully exhausted. Tax benefits of debt are a second order effect. Support for the pecking order is not unanimous, while Fama and French (2002), find a negative relationship between earnings

and debt, Frank and Goyal (2003), present evidence that the pecking order works particularly well in large firms with uninterrupted data and low information asymmetry. However, Lemon and Zender (2003), show that the pecking order results extend to all firms in general when debt capacity is considered. Debate about the pecking order continues.

Recommendations

The effect of capital structure (debt - equity ratio) on the value of the firm and its cost of capital has been a contentious issue in extant finance literatures. Based on the relevant theories and approaches highlighted above, this paper therefore, recommends the existence of an optimal capital structure where the value of the firm and its shareholders wealth are maximized and cost of capital minimized, this support the arguments of the Net Income approach that leverage/debt is beneficial to the firm.

The ultimate objective of any firm is to maximize its shareholders value and minimize its cost, this can be achieved through effective use of debt capital which is the cheapest of all sources of funds available to any firm in addition to the fact that it is tax deductible. Also, the pecking order theory recommends the superiority of debt to equity when sourcing funds. All these show the relevance of capital structure and the usage of debt capital.

Besides, the arguments of M-M theory about irrelevance capital structure have been refuted because most of all the assumptions on which it is based are not realistic empirically. However, this paper recommends that an optimal capital structure exist for all firms because of high degree of flexibility in capital restructuring continually depending on the prevailing conditions. Firms in their quest for shareholders wealth maximization should therefore, make use of debt capital to the point where the tax benefit from such debt is exactly equal to the costs that comes from the increased probability of financial distress.

Summary and Conclusion

The capital structure decision of the firm is characterized by a choice of the combination of debt and equity which can be optimally used to increase the value of the firm or decrease its cost of capital. The effect of capital structure on the value of firm and cost of capital has been a contentions issue in finance, hence there are different views to this issue. While some believe that there is no optimum mix of debt and equity hence the irrelevance of capital structure theory, others are of the view that there exist an optimum combination of debt and equity and therefore capital structure theory is of great relevance.

In real life, if we ignore taxes, financial distress cost, and other imperfections, we discover that there is no ideal mixture of debt and equity hence the firm's capital structure is irrelevant. However, with the effect of corporate taxes, capital structure is very important because interest is tax deductible and this generates a valuable tax shield. Unfortunately, we also found out that the optimal capital structure is, 100 percent debt financing which is not something we observe in healthy firms; because no firm can rely on only one source of finance.

Besides, further examination of capital structures reveal that firms do not use great amounts of debt, but pay substantial taxes, this suggest that there is limit to the use of debt financing to generate tax shields. Also firms in similar industry tend to have similar capital structures, suggesting that the nature of their assets, and operations is an important determinant of capital structure. Overall, we are still lacking a satisfactory, comprehensive and positive explanations for firms' capital structure observed behaviour. Theoretically, it is still not well understood why firm's capital structure recurrently appear in certain patterns. We therefore, need to resort to a more robust framework to gather useful insights into the financing behaviour of actual real-world firms.

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