

## A literature review of the trade-off theory of capital structure

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### Abstract

*Starting with Modigliani and Miller theory of 1958, capital structure has attracted a lot of attention from different scholars. The main question that they raised where: How do firms choose their capital structure or leverage? Does firm have a target capital structure? What are the main firm's specific factors or determinants that influence the choice of capital structure? Does the economic conditions of the country (GDP growth rate, inflation rate, base lending rate etc.) influence on the determination of the firm's level of debt? This paper provides a survey of the literature on trade off theory of capital structure. The aim of this paper is to give useful information in understanding corporate finance and in a particular way the trade-off theory of capital structure. This study represents a theoretical approach which has in focus the literature review of same earlier studies which have proved the existence or not of this theory in different contents. We can conclude that economists have not yet reached a consensus on how to determine the optimal capital structure, the one that would bring the maximization of firm's value.*

**Keywords:** *Capital structure, Modigliani and Miller's Proposition, market value maximization, trade-off theory.*

### 1. Introduction

According to Brigham and Ehrhardt (2008) capital structure refers to the firm's mixture of debt and equity. Firms may raise funds from external sources or plow back profits rather than distribute them to shareholders. In reality, capital structure may be more complex including different sources.

The Modigliani-Miller theorem in 1958 forms the basis of further studies on capital structure. The theorem states that, in a perfect market, how a firm is financed is irrelevant to its value.

For this reason their theorem is called "The Irrelevance Theorem" (Modigliani and Miller, 1958). But in the real world capital structure is relevant, that is, a company's value is affected by the capital structure it employs.

Many studies are focused on optimal capital structure and each firm has an optimal (target) capital structure, defined as that mix of debt, preferred and common equity that causes its stock price to be maximized. Therefore a value-maximizing firm will establish an optimal capital structure and then raise new capital in a manner that will keep the actual capital structure on target over time (Brigham and Ehrhardt 2008).

Myers (1984) takes another position in contrast to earlier studies saying that different capital structure theories don't seem to explain actual financing behavior, and it seems presumptuous to advise firms on optimal capital structure when we are so far from explaining actual decisions. De Wet (2006) proved that at the financial structure that yields the lowest WACC, the value of the firm as a whole is also maximized. So according to his study he identified a correlation between the increase in firm's value and the optimal level of leverage and showing how the value of a firm can be increased with increased levels of debt. According to Rajan and Zingales (1995), profitability is negatively correlated with leverage and the negative influence of profitability on leverage should become stronger as firm size increases.

The remainder of this paper is organized as follows. Section 2 concisely introduces financial leverage and capital structure, Section 3 explains the concept of the market value maximization, Section 4 provides the theoretical developments of trade off theory, Section 5 provides the literature survey focusing on empirical evidence from international studies, and Section 6 summarizes the paper.

## **2. Financial leverage and capital structure**

Financial leverage is the portion of a firm's assets financed with debt instead of equity (Brigham and Ehrhardt (2008)). It involves contractual interest and principal obligations. Financial leverage benefits common stockholders as long as the borrowed funds generate a return in excess of the cost of borrowing, although the increased risk can offset the general cost of capital. The use of debt or financial leverage concentrates the firm's business risk on its stockholders because the debt holders who receive fixed interest payments, bear none of the business risk (Brigham and Ehrhardt 2008, p. 572). According to Brigham and Ehrhardt (2008) capital structure refers to the firm's mixture of debt and equity. Firms may raise funds from external sources or plow back profits rather than distribute them to shareholders. In reality, capital structure may be more complex including different sources.

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### **3. Market value maximization as the primary objective**

Modigliani and Miller (1958) have identified two criteria of rational decision-making, namely (1) the maximization of profits and (2) the maximization of market value. According to the first criterion, a physical asset is worth acquiring if it will increase the net profit of the owners of the firm. But net profit will increase only if the expected rate of return, or yield, of the asset exceeds the rate of interest. According to the second criterion, an asset is worth acquiring if it increases the value of the owners' equity, i.e., if it adds more to the market value of the firm than the costs of acquisition (Modigliani and Miller, 1958, p. 262).

"In fact, the profit maximization criterion is no longer even well defined. Under uncertainty there corresponds to each decision of the firm not a unique profit outcome, but a plurality of mutually exclusive outcomes which can at best be described by a subjective probability distribution. The profit outcome, in short, has become a random variable and as such its maximization no longer has an operational meaning" (Modigliani and Miller, 1958, p. 263).

So according to MM (1958) the right question to be done is: Will the project, as financed, raise the market value of the firm's shares? (Modigliani and Miller, 1958, p. 264) But according to Jensen (2001), p.298), "A firm cannot maximize value if it ignores the interest of its stakeholders" He has defined the stakeholder theory and according to him this theory is completely consistent with value maximization or value-seeking behavior, which implies that managers must pay attention to all constituencies that can affect the value of the firm.

Brigham and Ehrhardt (2008) suggest that the same actions that maximize fundamental stock prices also benefit society for the reasons:

1-To a large extent shareholders are society-in now days the number of households which own stocks directly is increased especially in pension funds, insurance companies, and mutual funds

2-Consumer benefit-to achieve the primary objective, the company should try to reduce costs, produce high quality goods and services developing new ones and producing products that the costumers need to buy.

3-Employees benefit-firms that increase stock prices, add more employees.

Firm value is based on a stream of cash flows that the firm will generate in the future (Brigham and Ehrhardt, 2008, p. 84). But according to Martin (2008) shareholder value maximization does not always bring maximization of social welfare because:

- First, maximizing the value of the common shareholder's investment must be equivalent to maximizing the overall wealth being created by the corporation. The response to this question arises from what economists call agency costs of the firm (Jensen and Meckling, 1976). The idea is that only the stockholders of the firm are residual claimants and the economic interests of all other stakeholders are contractually protected. But the claims of non-shareholder are not fully protected by contract. So if the firm's management increases the overall risk of the business and the firm's creditors are unable to adjust the contract terms of their loans to reflect the firm's higher risk, the stockholders will be the beneficiary of a wealth transfer. This wealth transfer has no net benefit to society yet it is obviously of benefit to the firm's common stockholders at the expense of the firm's creditors.

- Second, maximizing the wealth created by the firm must be equivalent to maximizing social welfare. There are members of society who are impacted by the firm's actions who have no contractual claim on the corporation's earnings, but who may suffer from different externalities or side-effects. For example, manufacturing that causes air pollution which imposes costs on the whole society.

There are two possible responses to the problem of externalities. The first relies on private markets and the second on government. The private market solution was proposed by Nobel laureate Ronald Coase (1960). According to Coase (1992, p. 717), "In a regime of no transaction costs, on assumption of standard economic theory, negotiations between parties would lead to those arrangements being made which would maximize wealth and this irrespective of the initial assignment of right". So the Coase Theorem proposes that where the losses and gains from the externality belong to two distinct parties, they can bargain to achieve the socially desirable outcome.

#### **4. Theory of Capital Structure**

The relationship between capital structure and firm performance has been the subject of debate of earlier and actual studies (Memon, Bhutto and Abbas, 2012). This debate consist on whether there is an optimal capital structure for a firm or whether the use of debt is irrelevant to the firm's performance or value (Modigliani-Miller, 1958). The literature on the relationship between firm performance and capital structure has produced different results( Modigliani and Miller, 1958; Myers, 1984; Titman and Wessels, 1988; Harris and Raviv, 1990; Rajan and Zingales, 1995; Gosh et al, 2000; Frank and Goyal, 2003). Also

the studies on capital structure, have been developed different theories including trade-off theory, agency costs theory, signaling theory and pecking order theory. The trade off theory is explained below:

#### 4.1 Trade-Off Theory

*By including market imperfections, firms seem to get an optimal, value-maximizing debt-equity ratio by trading off the advantages of debt against the disadvantages. So firms will set a target debt ratio and gradually will move towards achieving it (Myers, 1984).*

One of the main assumptions in the Modigliani and Miller (1958) is that there are no taxes. The trade-off theory is a development of the MM theorem but taking in consideration the effects of taxes and bankruptcy costs. This theory is considered as the first step for the development of many other theories which have studied how firms choose their capital structure. Modigliani and Miller's (1958) theory can be used to describe how firms use taxation to manipulate profitability and to choose an optimum debt level. Debt level at the other side increases the risk of bankruptcy or as we call it the bankruptcy costs because as the debt to equity ratio increases the debt holders will require higher interest rates but also the shareholders will pretend higher profits for their investments. (Brealey and Myers, 2003, p. 508-509) According to Brealey and Myers (2003) financial managers often think of the firm's debt-equity decision as a trade-off between interest tax shields and the costs of financial distress. "Companies with safe, tangible assets and plenty of taxable income to shield ought to have high target ratios. Unprofitable companies with risky, intangible assets ought to rely primarily on equity financing. If there were no costs of adjusting capital structure, then each firm should always be at its target debt ratio" (Brealey and Myers, 2003, p. 509) The value of the firm can be calculated with the formula:

$$V = D + E = VF + PV - PV$$

Where:

$VF$  = corporate value with all-equity financing,

$PV$  = interest tax shields (the present value of future taxes saved because of the tax deductions for interest rates)

$PV$  = costs of financial distress (the present value of future costs due to the default risk with higher leverage)

According to the trade-off theory, the manager should choose the debt ratio that maximizes firm value (Brealey and Myers, 2003, p. 498). So according to the trade-off theory, companies' capital structure decisions point towards a target debt ratio, where debt tax shields are maximized and bankruptcy costs associated with the debt are minimized. According to Myers (2001) debt offers

firm a tax shield. The advantage is because the interest of debt is deductible before paying taxes Modigliani and Miller (1963). "This means, among other things, that the tax advantages of debt financing are somewhat greater than we originally suggested" (Modigliani and Miller, 1963, p. 434). So firms increase the level of debt in order to gain the maximum tax benefit but at the other side they increase the risk of a possible bankruptcy.

According to the static trade-off hypothesis, a firm's performance affects its target debt ratio, which in turn is reflected in the firm's choice of securities issued and its observed debt ratios (Hovakimian et al., 2001).

The standard presentation of static trade-off theory is provided by Bradley et al. (1984). They made the following conclusion based on their static trade-off model:

1. An increase in the costs of financial distress reduces the optimal debt level.
2. An increase in non-debt tax shields reduces the optimal debt level.
3. An increase in the personal tax rate on equity increases the optimal debt level.
4. At the optimal capital structure, an increase in the marginal bondholder tax rate decreases the optimal level of debt.
5. The effect of risk is ambiguous, even if uncertainty is assumed to be normally distributed. The relationship between debt and volatility is negative.

This theory has been both criticized and supported focusing on the fact that this theory is based on the assumption of perfect knowledge in a perfect market (Myers, 1984). Also the theory predicts that highly profitable firms will have higher debt levels in order to maximize taxation benefits and increase the availability of capital. Different studies have been developed to prove if the companies in reality follow the trade of theory (Sogorb and López, 2003; Hackbarth, Hennessy and Leland, 2007; Serrasqueiro and Nunes, 2010).

#### **4.2 Static trade off theory**

The static trade off theory of optimal capital structure assumes that firms balance the marginal present values of interest tax shields against the costs of financial distress. (Shyam, Sunder and Myers, 1999). The optimal level is when the marginal value of the benefits associated with debt issues exactly offsets the increase in the present value of the costs associated with issuing more debt (Myers, 2001). The benefits of debt are the tax deductibility of interest payments which favors the use of debt but the positive effect can be complicated by the existence of personal taxes (Miller, 1977) and non-debt tax shields (De Angelo and Masulis, 1980). De Angelo and Masulis (1980) study proposed a theoretical optimum level of debt for a firm, where the present value of tax savings due to further borrowing is just offset by increases in the present value of costs of

distress. Also this theory assumes there are no transaction costs to issuing or repurchasing securities (Dudley, 2007). This theory also suggests that higher profitable firms have higher target debt ratio, because they would ensure higher tax savings from debt (Niu, 2008, p. 134), lower probability of bankruptcy and higher over-investment and these require a higher target debt ratio.

#### **4.3 Dynamic trade off theory**

According to the static trade off theory the companies balance the tax benefits of debt with the risks of bankruptcy. But according to dynamic trade off theory it is costly to issue and repurchase debt in order to achieve the target debt ratio that would achieve the maximization of firm value. So Firms whose leverage ratios is not exactly as their target one, will adjust their capital structure when the benefits of doing so outweigh the costs of adjustment (Dudley, 2007). Dynamic trade off theory suggests that firms let their leverage ratios vary within an optimal range (Dudley, 2007). Hovakimian et al. (2001) found that more profitable firms are more likely to issue debt over equity. Empirical evidence of Dudley (2007) study supports the predictions of dynamic trade off theory, concluding that volatility increases the optimal leverage range and profitability and interest rates reduce the leverage range. He took data from COMPUSTAT for US companies with from 1994 to 2004 with a total of 25,102 firm year observations and undertook a two stage estimation procedure. According to Dudley (2007) study profitable firms find it advantageous to readjust their debt ratios more often in order to capture the tax benefits of debt as predicted by the dynamic trade off theory.

#### **5. Empirical evidence of trade off theory**

Sogorb and López (2003) used a sample of 6482 Spanish SMEs during the five-year period 1994–1998. Using panel data methodology, they found evidence that SMEs attempt to achieve a target or optimum leverage (like that suggested by the trade-off model) which is explained as a function of some specific characteristics of the firm, and they found less support for the view that SMEs adjust their leverage level according to their financing requirements (pecking order model). Also according to their study the coefficient of the effective tax rate is positive and statistically significant, so if SMEs have to pay more taxes they should increase the use of debt to reduce tax bills, but there are other costs like depreciation which are considered non-debt tax shields that reduces the importance of the fiscal advantage of debt. According to Hackbarth, Hennessy and Leland (2007) the trade-off theory is sufficient to explain many facts regarding corporate debt structure. They studied the optimal mixture and priority structure of bank and market debt using a trade-off model in which banks have the unique ability to renegotiate outside formal bankruptcy.

Serrasqueiro and Nunes (2010) study of 39 companies for the period of 1998 to 2006, conclude that the attempt for a trade-off between debt tax shields and bankruptcy costs seems to have little relevance in explaining the capital structure of quoted Portuguese companies. They used financial data from the balance sheets and income statements of the companies selected from Analysis System of Iberian Balance Sheets. Using OLS regressions they found that the firms adjust their actual level of debt towards a target debt ratio, but because of higher transaction costs the adjustment towards a target debt ratio of quoted Portuguese companies is slower than that found in similar studies of German, British, Spanish (Sogorb and Lopez, 2003) and USA companies.

## 6. Conclusions

This paper is a review of the literature of trade off theory of capital structure theory. The theories of capital structure begin with Miller and Modigliani "Theory of Irrelevance" of 1958 and continuing with Trade off Theory, Pecking Order Theory and Agency Theory etc. Also this paper provides some evidence on prior studies done to prove if these theories are supported inside the content of different economy situations. As this survey shows, both empirical and survey evidence are different and sometimes contradictory. Economists have not yet reached a consensus on how to determine the optimal capital structure (debt to equity ratio) the one that would bring the maximization of firm value and this study presents a theoretical approach toward understanding some financial issues which are not very much discussed in our country.

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