

RISK AND PROFITABILITY AS CAPITAL STRUCTURE DETERMINANTS

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Determining the optimal capital structure of a firm faces a difficult decision that involves the strategic trade-off between risk and profitability. Although many empirical studies have been done since the Miller and Modigliani theorem forms the bases for modern thinking on capital structure, no consensus has been reached with regard to the relationship between profitability and leverage. In contrast to theoretical deductions, many empirical studies show that leverage is negatively related to profitability. The main objective of this study is to explain the role played by profitability in establishing the firm's capital structure by examining the relationship between profitability, risk and leverage, and attempts to find the answer to the question: why do more profitable firms have lower leverage ratios?

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1 Theories of capital structure

The pioneering paper published in 1958 by Merton Miller and Franco Modigliani is considered the cornerstone of modern corporate finance and capital structure analysis. The main idea of the theorem is an irrelevance proposition: The provocative M&M Theorem provides the conditions under which a firm's financing decisions do not affect its value. It states that, in a perfect capital market, in the absence of taxes, transaction costs, bankruptcy costs, and asymmetric information, the value of a firm is unaffected by how that firm is financed. It does not matter if the firm's capital is raised by issuing stock or selling debt (the firm's debt-equity ratio does not affect its market value). It does not matter what the firm's dividend policy is. Therefore, the Modigliani-Miller theorem is also often called the capital structure irrelevance principle.

In a subsequent paper (1963), they eased the initial assumptions and stated that under capital market imperfections (if the financial markets are competitive and corporations are taxed) the value of the levered firm equals that of the unlevered firm plus the value of the debt tax shield, due to the preferential treatment of debt relative to equity. So the firm's optimal capital structure is determined by the trade-off between the tax advantage associated with debt and the increased bankruptcy risk associated with the higher leverage. This statement predicts that financial leverage and economic performance are in a proportional relationship.

Although many empirical studies have been done since the Miller and Modigliani theorem forms the bases for modern thinking on capital structure, no consensus has been reached with regard to the relationship between profitability and leverage. The three most significant theories that aim to explain the correlation between capital structure and the market value of the firm are the trade-off, pecking order, and market timing models.

The essence of the **static trade-off theory** (referred to as the tax based theory), is that a value maximizing firm will consider the trade-off between the tax shelter provided by debt and the cost of financial distress [Brealey and Myers, 2003]. According to the static trade-off theory firms select optimal capital structure by examining the net tax advantage of debt financing by comparing debt advantages (tax shield benefits, the disciplinary role of debt on managers [Jensen & Meckling, 1976], lower information costs relative to equity finance costs) with drawbacks (the costs of bankruptcy due to higher debt and the costs of financial distress due to information asymmetry between shareholders and creditors) [Dobrica, F. I, 2007]. Firms adopting this theory

could be regarded as setting a target debt-to-value ratio, and would continuously and gradually adjust their capital structures toward this target in order to maximize the firm's value.

Hence, if firms seek external financing, they should issue equity when their leverage is above the desired target leverage, issue debt when their leverage is below the target, or issue debt and equity proportionately to stay close to the target. Myers (1984), however, suggests that when the firm's equity is under priced in the market, managers are reluctant to issue equity. The consequence is that potential investors tend to react negatively to an equity issue, because they perceive equity issues to only occur if equity is either fairly priced or over priced, which conjuncture is not a benefic one to buy the firm's securities. As a result, managers are reluctant to issue equity.

According to the trade-off theory, highly profitable corporations with stable, tangible assets tend to have higher target gearing ratios as their assets are relatively safe. In contrast, companies with mostly intangible and risky assets tend to have lower debt-equity ratio and rely more heavily on equity financing. The trade-off theory fails to explain the simple empirical evidence that more profitable firms have lower leverage, and the use of debt decreases with profitability.

An intriguing approach to studying the optimal capital structure is the so called **pecking order theory** [Donaldson, 1961; Myers & Majluf, 1984; Myers, 1984] constructed on the information asymmetry hypothesis, which suggests that there is no optimal capital structure. It states that because of asymmetries of information between insiders (managers) and outsider lenders and investors, the companies prioritize their sources of financing, and establish a hierarchical order according to the law of least effort, or of least resistance. Hence, due to adverse selection, managers prefer to use internal funds (retained earnings) first, and when that is depleted, debt is preferred over equity-issue if external financing is required. External equity is preferred only when the firm reaches its "debt capacity". In this case there isn't a determinate relationship between profitability and leverage. If there is a rich pool of good business opportunities and debt is available at reasonable cost, then increased leverage may be associated with higher performance. However, there is a risk of over investment into inferior ventures in which case we might see the inverse relationship [Andersen T. J., 2005].

A number of studies reveal that pecking order theories are not sufficient to explain all capital structure choices [Fama and French, 2004; Leary and Roberts, 2007].

The third theory, the **market timing theory** [Baker and Wurgler, 2002], based on the corporate mispricing, provides a new explanation to the financing decisions of the firm, and challenges both the trade-off and the pecking order theories. The model suggests that managers recourse to equity issuance in time periods during which the company's stocks have high market values relative to their book and past market values. This lowers the firm's cost of equity and benefits current shareholders at the expense of new shareholders. According to this theory, the equity issuing decision is guided by the managers' capability to time the market accordingly to the relative cost of debt and equity. While Baker and Wurgler (2002) states that "the capital structure is the cumulative outcome of attempts to time the equity markets", Dittmar and Thakor (2005) show that firms may issue equity when the stock prices are high even when managers do not attempt to exploit marker mispricing [Schultz, 2003].

2 The effect of leverage on risk and return

Leverage and capital structure are closely related concepts linked to cost of capital and therefore capital budgeting decisions. Operating leverage is concerned with the relationship between the firm's sales revenue and its earnings before interest and taxes. Operating leverage can be defined as the ability to use fixed operating costs to magnify the effects of changes in sales on earnings before interest and taxes. When a firm has fixed operating costs, operating leverage is present. An increase in sales results in a more than proportional increase in EBIT (earnings before interest and taxes); a decrease in sales results in a more than proportional decrease in EBIT.

Financial leverage is concerned with the relationship between the firm's earnings before interest and taxes and the earnings available for common stockholders. Financial leverage measures a firm's exposure to financial risk and results from the presence of fixed *financial charges* in the firm's income stream. These fixed charges do not vary with the firm's earnings before interest and taxes; they must be paid regardless of the amount of EBIT available to pay them.

Total leverage is concerned with the relationship between the firm's sales revenue and the earnings available for common stockholders. This combined effect, or total leverage, can be defined as the firm's ability to use fixed costs, both operating and financial, to magnify the effect of changes in sales on the firm's earnings per share.

Risk comes into play in two ways: (1) the capital structure must be consistent with the business risk, and (2) the capital structure results in a certain level of financial risk. In other words, the prevailing business risk tends to act as an input into the capital structure decision process, the output of which is a certain level of financial risk.

Business risk can be defined as the relationship between the firm's sales and its earnings before interest and taxes (EBIT). In general, the greater the firm's operating leverage – the use of fixed operating cost – the higher its business risk. Although operating leverage is an important factor affecting business risk, two other factors also affect it – revenue stability and cost stability. Revenue stability refers to the relative variability of the firm's sales revenues. Cost stability is concerned with the relative predictability of input prices such as labor and materials.

The firm's capital structure directly affects its financial risk, which can be described as the risk resulting from the use of financial leverage. Since the level of this risk and the associated level of return (*eps*) are key inputs to the valuation process, the financial manager must estimate the potential impact of alternative capital structures on these factors and ultimately on value in order to select the best capital structure.

Since capital structure policy involves a strategic trade-off between risk and expected return, the target capital structure policy must seek a prudent and informed balance between risk and return [Akintoye, 2008]. The firm must consider its business risk, tax positions, financial flexibility and managerial conservatism or aggressiveness.

In general, firms with low operating leverage, stable revenues, and stable costs have low business risk, while firms with high operating leverage, volatile revenues, and volatile costs have high business risk. Firms with stable revenues and costs can accept greater operating leverage (fixed operating costs) than those with volatile patterns of revenues and costs. Business risk is not affected by capital structure decisions. The higher the business risk, the more cautions the firm must be in establishing its capital structure. Hence, if a firm operates in an environment characterized by a high degree of business risk should reduce the financial risk by choosing to finance their activities with lower leverage.

To run a firm in a dynamic competition market it is essential to continue innovative ventures and conduct more risky actions to achieve higher performance. Firms can realize sustainable competitive benefits by deploying valuable, extraordinary, unreplaceable, firm specific assets. At the same time it imposes a higher level of business risk on firms' organizational activities which argues for lower financial leverage. These firms often struggle with high level of environmental uncertainty.

3 Profitability and capital structure choices

Corporations have three types of financing sources at their disposal: debt, external equity and internally generated equity. Debt financing can have benefic but also harmful effects on firms risk and profitability. Since interest is a deductible expense, debt financing leads to tax benefits, which lower the cost of financing for profitable firms, but at the same time can cause financial distress. If a firm can service high debt without risk, it will create added value to the shareholders. Financing an investment opportunity through debt can generate for a profitable firm

a higher Net Present Value, due to these tax savings, and accordingly can create wealth for the owners. The reverse aspect is that when a firm experiences liquidity problems, a low debt ratio can be burdensome. Hence, firms should employ debt interdependently to the stability of its cash-flows. The stability of cash-flows allows firms to service a larger amount of debt capital, by lowering the risk of insolvency.

Liquidity problems and cash-flows irregularity can affect the financing decision, as they tend to raise the cost of the debt. Empirical evidence show that larger firms are perceived to have lower risk levels, hence they are more diversified and have lower variance of earnings, making them able to tolerate higher debt ratios. Graham (2000) concludes that large and profitable companies present usually a low debt rate. He also pointed out that large companies, which have means to offer good collaterals, usually find relatively lower financial costs, which does not mean that they display higher leverage.

Large companies, which have means to offer good collaterals, usually find relatively lower financial costs, which don't mean that they have a high debt level. Besides these factors, a lot of firms can opt to maintain flexibility reserves, using debt well below their potential, devising a possible future need. In case of smaller firms solving the information asymmetries with creditors requisites higher costs.

We can conclude that there is a negative relationship between profitability and leverage, because leverage degree generates agency problems among financial creditors and stockholders. The profitability of a firm is the main determinant of internally generated funds, and higher profits increase the level of internal financing. More profitable firms have more internally generated funds, and tend to avoid gearing. Hence the firm financial performance is a main determinant of its capital structure, because it affects one of these three main financing sources – internally generated funds. If these funds are sufficient to finance the firm's activity, than the need for debt financing is lower even if more profitable firms have an easier access to loans. This fact seems to confirm the predictions of the pecking order theory.

According to the static trade-off theory, profitable firms should have higher optimal leverage ratios. Contrary to the static trade-off theory's predictions, empirical evidence shows, that more profitable firms use lower leverage ratios. This evidence is the ground on which the pecking order theory is constructed [Fama and French, 2002]. This theory predicts that, due to adverse selection costs, firms follow the pecking order from internal funds, to debt, and to equity to finance new investments. More profitable firms raise less debt because they have more internal funds to rely on. The negative relation between profitability and leverage ratios thus suggests that tax benefits are of secondary concern [Chen and Zhao, 2004].

A possible explanation which partly reconciles the trade-off and the pecking order theory is that firms allow their leverage ratios to fluctuate within a certain range around the target rate, and do not adjust constantly their leverage ratio because the transaction costs that occur.

4 Conclusions

The choice among the ideal proportion of debt and equity can affect the value of the company, as much as the return rates can. The evidence shows that more profitable firms fund a larger proportion of their activity with debt capital, so they have lower leverage ratios. We can conclude that there is a negative relationship between profitability and leverage, because leverage degree generates agency problems among financial creditors and stockholders. In establishing their capital structure firms must consider their business risk, tax positions, financial flexibility and managerial conservatism or aggressiveness.

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