



Review Paper

A Brief Review of Capital Structure Theories

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Abstract

This paper surveys literatures on five theories of capital structure theories from Modigliani and Miller research paper at 1958 to Halov and heider at 2004. There are two main sources of firms' financing: internal and external financing, internal financing is related to retained earnings and external financing could be in the form of borrowing or issue of equity. Firms continuously invest because of sustain and growth, for these reasons firms' financing decisions are very important. Traditional trade-off theory and pecking order theory are most acceptable theories of capital structure. As the traditional trade-off theory asserts, firms have one optimal debt ratio (target leverage). In comparison the pecking order theory implies firms' preference to internal finance over external finance and debt over equity. From the literature it cannot be concluded whether debt has any tax benefit on balance or not. But it can be said that the share price increases with the debt issuing announcement and falls after announcement of equity issue. As agency models anticipate, leverage is directly related to the value of firm, default probability, free cash flow, extent of regulation, liquidity value, interest coverage, cost of investigation of firm's prospects and the probability of reorganization upon default. On the other hand, leverage is expected to have inverse relationship with the growth opportunities and the importance of managerial reputation. And also, there are no conclusions about the effects of managerial ownership on leverage.

Keywords: Capital structure, traditional trade-off theory, pecking order theory, market timing theory, Agency theory.

Introduction

There are two main sources of firms' financing: internal and external financing, internal financing is related to retained earnings and external financing could be in the form of borrowing or issue of equity. Firms continuously invest because of sustain and growth, for these reasons firms' financing decisions are very important.

The capital structure theory says what the source of money supply is and what the strategy should be adapted to get this source for buying firm's assets or investment on projects. Selecting between debt and equity is a big challenge. Moreover, agency problem between insiders and outsiders and also among the insiders themselves is a complex dilemma. Those reasons had sufficed to Stewart Myers called the capital structure decision "capital structure puzzle". Financial Researchers have been interested in the capital structure issue after Modigliani and Miller's research paper publication in 1958¹.

Traditional Trade-off Theory and Pecking order theory are most acceptable theories of capital structure. According to the Traditional Trade-off theory, firms have one optimal debt ratio (target leverage). They always intend to be near this ratio, after any deviation happening, debt ratio gradually returns to the target or optimal leverage ratio. The optimal level is attained by making trade-off between the gains from debt or equity to loss from them. Benefits involve interest tax shield and the losses

include costs of financial distress, bankruptcy costs, agency costs, etc. In comparison, the pecking order hypothesis, as suggested for the first time by Myers and Majluf², highlights that there is no well-specified optimal debt level which firms try to achieve. Firms only use external finance when there are not sufficient sources of internal finance. On the basis of this theory, firms finance internally rather than externally and debt than equity.

Shyam-Sunder and Myers³ asserted that pecking order theory is better in explaining the firm's behavior rather than the Traditional Trade-off Theory. Nevertheless, many researchers argued contrast between the traditional trade-off theory and pecking order theory. According to Fama and French⁴ some firms track traditional trade-off theory while others the pecking order theory but none of them can be rejected.

Another theory of capital structure is market timing theory of capital structure which has been suggested by Baker and Wurgler⁵. According to this theory, current capital structure is based on past equity market timing. This theory also implies that when firm's share price is overvalued they issue equity and when their share price is undervalued they repurchase equity.

Of course, country and economic specific factors are playing significant roles in corporate financing decisions; some of those factors are corporate governance, corporate and personal tax system, law and regulations, development of capital and debt

markets, etc. A country with high tax rate will perceive more tax advantages and will be expected to have higher target debt ratios. Booth, Aivazian, Demirguc-kunt and Maksimovich (2001)⁶ investigated ten developing countries and discovered that among those countries, country specific factors are significant too. This paper discusses five theories of capital structure which has been mostly argued in literature.

Value-Irrelevance Proposition by the Modigliani-Miller

Modigliani-Miller (MM) proposition is the first theory about capital structure. According to MM proposition, firm value is irrelevant to capital structure or financing decision. This proposition was presented by Modigliani and Miller in their research paper⁷. They supposed that value of a firm is discounted free cash flow till present with related rate of return. "Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital"⁸. However, the theory was proposed under the ideal capital market conditions. The following assumptions were laid down by them, which are hardly true in real world: i. Capital markets are ideal with no transaction and bankruptcy costs, ii. There are not different risk classes for firms, iii. Only one kind of tax matters is the corporate tax payable to the government, iv. All cash flows are perpetuities and no growth factor in cash flow is assumed, v. Insiders and outsiders have no information asymmetry, vi. There is no moral hazard on manager's part and they work for shareholder's Wealth maximization, vii. Firms issue solely two varieties of claims: equity with risk and debt without risk.

MM hypothesis does not result definitively. It led to the plenty of research about what is important for the capital structure, which is basically focusing on violation of the assumptions. Now there is no any discussion that value of firms depends upon its assets, cash flows and growth opportunities. Clearly, most of the debts in the capital markets are risky. And also Information asymmetry exists within investors as well as between insiders and outsiders⁸. Modigliani and Miller⁹ recognized the benefits of personal tax and introduced a model of capital structure incorporating this. Stiglitz¹⁰ have removed the assumption of same risk class. Myers¹¹ insists that capital structure puzzle is more complex than the dividend puzzle.

The Traditional Trade-off Theory

Recognizing the tax shield as a determinant of the capital structure was incorporated in the MM proposition by Modigliani and Miller themselves⁹. Later, it was recognized that benefits of the tax shield are offset to a great extent by the costs of financial distress¹². However, the tax shield is an observable factor but the costs of financial distress are not. So, to be on the safer side, firms maintain a safety of margin before taking advantage of the tax shield. Hence, benefit from tax shields are offset by costs of financial distress. They entitle this theory to the trade-off theory.

It seems to costs of financial distress and benefits from tax shields are balanced. Therefore, we expect companies with more costs of financial distress have less debt in their capital structure. Trade-off theory suggested the modified MM proposition¹³.

$V(\text{firm}) = V + PV(\text{interest tax shields}) - PV(\text{costs of financial distress})$

Where, V is the value of firm with entire equity

There are some fundamental concepts of the Traditional Trade-off Theory. Typically, this theory explains why firms follow a moderate and cautious approach to debt issues, despite benefits of tax shields. There are some testable implications of this model like firms with high risk, firms with abnormally valorous growth opportunities and firms with intangible assets will issue less debt as these have high costs of financial distress. Firms with assets which have secondary market may issue more debt. Firms with more tax advantage may issue more debt. Mackie-Mason¹⁴ shows tax-paying firms favor debt. Long-term debt is significantly dependent on firm's efficient marginal tax¹⁵. On the contrary, as Fama and French¹⁶ discovered there is not any net tax benefit in debt and in equilibrium, debt is along bad news about profitability that override interest tax shield or other benefits of debt. They also found inverse relationship between value of firm and debt, even after holding constant earnings, investment and R and D.

There has been evolved a more general theory of trade-off which considers many more factors besides tax and costs of distress for comparing the advantage and the disadvantages of the tax and equity and obtains a trade-off. In this more general theory, there are several arguments as why firms might try to adjust their capital structure.

Some of the advantages of debt are as follows (besides the interest tax shields advantage): i. Debt is a valuable device for signaling by firms. It was suggested by Ross¹⁷ that leverage, increases firm's value, because enhancing leverage is coincide with the market's realization of value. ii. Agency costs related to equity will be reduced by debt. These agency costs are such as free cash flow problem or also called over investment problem⁸. iii. Debt reduces the agency cost of management so that it disciplines managers.

Disadvantages of debt are as follows (besides the costs of financial distress /bankruptcy): i. Managers acting in shareholders' interest may shift investment to more risky assets and the costs are incurred by the debt holders. ii. Managers may borrow still more and pay out to the shareholders, hence the debt holders suffer. iii. Excessive debt leads to the underinvestment problem or 'debt overhang' problem. This means that many good projects may be passed on because more debt cannot be issued at the right time due to the existing debt.

The Traditional Trade-off Theory proposes that all firms have an optimal leverage (debt ratio). This optimal debt ratio is a point where advantages of tax shield gets offset by costs of financial distress. This often leads to 'target adjusted' mean reverting behavior in debt ratios in time¹¹. It is important to note that this target is not discoverable but it may be computed from firm's variables such as debt-to-equity, firm's size, growth options and non-debt tax shields etc⁴. The trade-off theory did not consider the information asymmetry had not been considered in trade-off theory. This assumption was later relaxed which led to the pecking order theory which was stood on the conflicts between the insiders and the outsiders due to different information at their hands.

The Pecking-Order Theory

Myers and Majluf² and Myers¹¹ propose the pecking order theory. Besides information asymmetry between the insiders and the outsiders, Myers and Majluf assume perfect market like Modigliani and Miller. Managers will not issue new undervalued shares, if they are acting in favor of shareholders. In equilibrium a firm issues new stock only at a market down price². Managers will issue new equity shares with the hope of getting offset by NPV of growth opportunity or new investment opportunity. This leads to drop in share price. Hence, this is a bad news for assets in place. The issue becomes worse as the information asymmetry increases. For investing, firms with more growth opportunity are better than matured firms, because the price falling down is affected by growth opportunity value versus assets in place. Debt has the prior claim over equity and debt issuers are less exposed to information asymmetry. Therefore, issue of the debt should affect on price as compared to equity issue. Kim and Stulz¹⁸ found that share price increased with the announcement of debt issue. But in the case of equity issue, Masulis and Korwar¹⁹ discovered that the share price falls after announcement of equity issue.

As pecking order theory suggests firms rely on internal sources with lowest information asymmetry costs, then debt and ultimately equity with highest information asymmetry costs. Firms don't have optimal debt ratio and hence the firm's debt ratio is representing the accumulated external financing required. As this theory says, firms with more profitability issue less debt.

On the basis of pecking order theory, net debt issue should track financial deficit closer than net equity issue. Myers¹¹ came up with modified pecking order theory. He proposes that the firm should take advantage from filling the financial slack by issuing equity when the information asymmetry is less. With the way proposed by Myers firms can issue debt with more flexibility. That is why firms with some growth maintain low debt issue.

Shyam-Sunder and Myers³ demonstrated strong validity for the pecking order theory while Frank and Goyal²⁰ provided little

support for that. In contrariwise, Korajczyk, Lucas and McDonald²¹ found that debt issues do not have priority to equity issues.

Firms facing with financial deficit while they are working close to their debt capacity may not issue debt even if the firms track the pecking order theory. Issue of more debt exceeding the debt capacity point will reduce the firm value. Firms working near debt capacity point will issue equity even if debt is preferred. With above concept, it has been concluded that the debt capacity point is similar to the target debt ratio explained in the traditional trade-off theory of capital structure. Hence, it is very difficult to distinguish between two theories of capital structure. One of the useful ways to identify which firms are following the traditional trade-off theory or the pecking order theory is that at the time of IPO check whether firm has used all internal sources (retained earnings) or not, if the company used all internal sources for investing in the new project, then it is following the pecking order theory.

As pecking order theory proposes, small firms with more growth opportunities should issue more debt than equity. We should distinguish between firm's information asymmetry and industry's information asymmetry, but type of industry they are working has more volatile environment and therefore more information asymmetry. Capital structure researchers have neglected this aspect of information asymmetry. Information asymmetry may be related to firm's value or related to firm's risk. Pecking order theory clearly speaks about the asymmetry related to the firm's value and debt as a solution. Nevertheless, when we are facing asymmetry which is related to risk of the firm, debt is a bad choice, because risk shifting phenomena mentioned earlier in disadvantages of debt. Halov and Heider²² tried to test this by taking asset volatility as a proxy for risk. They demonstrate that with increase in asset volatility using equity is more frequent as compared to the debt.

Mean Reversion of Leverage Ratios: Existence of the target debt ratio and debt capacity is very crucial in the capital structure literature. Traditional trade-off theory predicts that there is an optimal debt ratio which the firms revert towards it¹¹. As pecking order says, mean reversion ought to be tested solely after checking the debt capacity. If the firm issues debt over equity we can find that debt capacity has not been arrived yet. Challenge is identifying the optimal debt ratio and or debt capacity.

Optimal Debt Equity Ratio: To test the traditional trade-off theory of capital structure, researcher ought to observe mean reverting behavior based on debt- equity ratio's time series data. Since target or optimum debt ratio is not observable, testing the mean reversion hypothesis is a crucial one. We require three levels of analysis: i. do individual firms follow the mean reverting behavior, ii. what are the determinants of the optimal debt level, and iii. what actions firms adapt when they deviate from the target. Most of the researchers tested this in developed

economies. However Booth et al.⁶ analyzed ten developing nations and found that firms having leverage less than their optimal leverage and adjusted faster towards it, were specified by less growth opportunities, more intangible assets, less non debt tax shields, more financing slack, less share prices and more deviation from their target leverage. Conversely, firms having more leverage than their target leverage and adjusted faster were specified by more growth opportunities, less intangible assets, more non debt tax shields, less financing slack, more share prices and more deviation from their target leverage.

As pointed out earlier, target debt is not observable and should be estimated from the time series data. Every individual firm has mean reverting points. We have to identify capital structure determinants like firm size, growth opportunities, tangible and intangible assets, etc on that mean reverting point and easily we have to build an equation by multiple regression analysis and then for future we can estimate target debt ratio in the traditional trade-off theory or debt capacity in the pecking order theory. First work in this area, adapted long term average as the target. These researches supposed one adjustment coefficient for the whole sample regardless of their properties like industry, firm characteristics (age, size, growth opportunities, tangible/intangible assets, etc), etc. one of these researchers is Shyam-Sunder and Myers (1999)³. They also assumed that the target debt-equity remains same throughout the time period. Typical model of mean reversion is as follows:

$$\Delta D_{it} = a + b_{TA}(D_{it}^* - D_{it-1}) + e_{it}$$

Where D_{it} is the level of debt, at time t of the firm I, D^* is the target debt level and b_{TA} is the adjustment coefficient. These assumptions are highly questionable on the following grounds:
 i. Without considering variance of the sample, long term average is very unfeasible for the optimum or target debt level.
 ii. Changing firm characteristics may lead to change in optimum target debt level.
 iii. It's unlikely to all firms have the same adjustment coefficient i.e. adjustment speed.

To solve above problems, We have to identify capital structure determinants like firm size, growth opportunities, tangible and intangible assets, etc. on that mean reverting point and easily we have to build an equation by multiple regression analysis and then for future we can estimate target debt ratio in the traditional trade-off theory or debt capacity in the pecking order theory.

The Market timing theory

The market timing theory of capital structure says firms issue new stock when their share price is overvalued and they repurchase their shares when their share price is undervalued. Accordingly fluctuations in stock price will affect on corporate financing decisions and ultimately corporate capital structure. There are two versions of equity market timing that result in the same capital structure dynamics⁵.

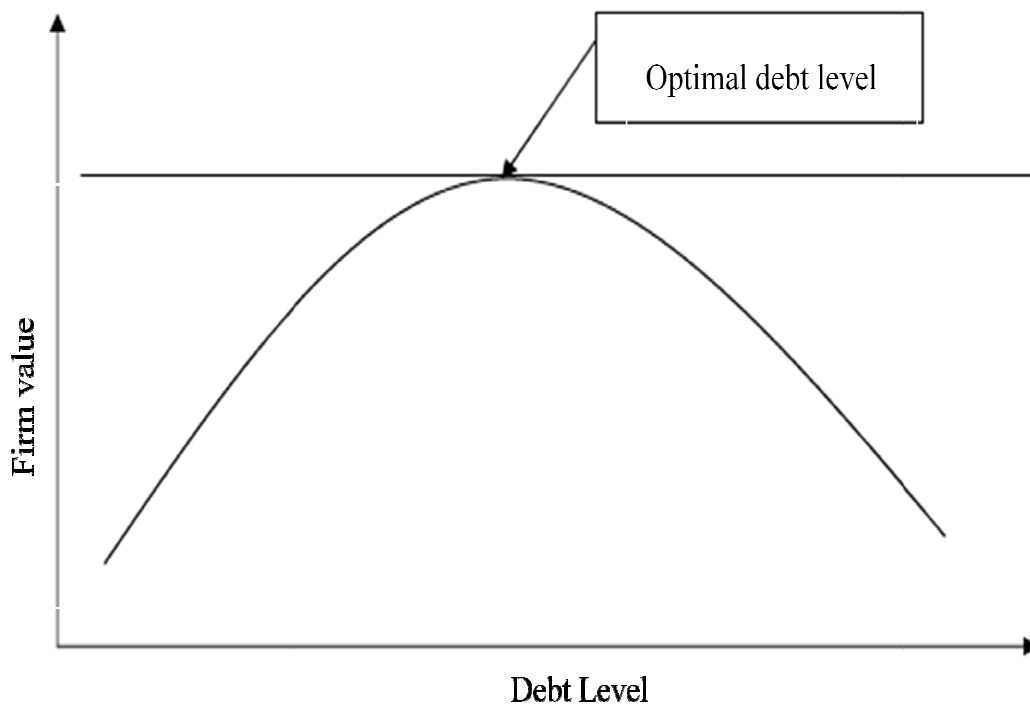


Figure-1
 Optimal debt-to-equity ratio (or debt capacity)¹³

The first one is a Dynamic version of Myers and Majluf², this version emphasizes on rationality of managers and investors. Issuing equity happens straightly when positive information reveals which it is cause of reducing information asymmetry between the firm's management and shareholders. Whenever information asymmetry reduces share price increases. Therefore, each firm times the market in its own²¹.

The second version of equity market timing according to Baker and Wurgler⁵ is that managers raise equity when cost of equity is abnormally low, because they think investors are irrational. Graham and Harvey²³ found amazing signs of market timing by managers in other ways. They observe executives try to time interest rates by issuing debt when market interest rates are exclusively low. Their findings significance was moderately strong that firms attempt to time the market with this way. They also found large firms are focusing on market timing very specially. This insinuates that firms are more probably to time interest rates when they have a large or sophisticated treasury department.

Baker and Wurgler⁵ documented how capital structure is affected by the historical ratio of market-to-book equity. They also conclude as follows: i. Firms with low leverage tend to raise funds when their valuation is high, on the other side, high leverage firms tend to raise funds when their valuation is low, ii. Volatility in market valuation, extremely affect capital structure.

Agency Theories of Capital Structure

Agency theory of capital structure is stood on conflicts between managers and shareholders mainly, because managers act in their own well being, while they have to act at the benefit of shareholders. With these actions, shareholders will be discouraged from the managers' part by monitoring and controlling, but to what extent these monitoring and controlling will continue while these monitoring are very costly. This agency theory results in pecking order theory of capital structure. Paying dividend to shareholders reduces resources under managers' control, consequently it will reduce manager's power, and there will be high probability of incurring monitoring of capital markets for the purpose of new capital financing. Managerial incentives are one of the causes of firm's growth more than the optimal size. With growth, resources under management's control will increase and accordingly increase in their power. Jensen⁸ states "conflicts of interest between shareholders and managers over payout policies are especially severe when the organization generates substantial free cash flow. The problem is how to motivate managers to disgorge the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies".

Jensen⁸ noted that debt mitigates the conflict between managers and equity holders. Grossman and Hart²⁴ noted that there is another good thing about debt. They said that if the bankruptcy is the cost to the managers, then they take better investment

decisions so that the probability of bankruptcy will be reduced. However, there are drawbacks of debt too on the behavior of the managers like underinvestment by passing good projects and investing in too risky projects etc.

Agency models suggest that leverage has direct relationship to the value of firm²⁶⁻²⁸, default probability²⁶, extent of regulation²⁷, free cash flow²⁷, liquidity value²⁶, and the importance of managerial reputation²⁸. On the other hand, leverage is expected to be negatively related to the growth opportunities²⁷, interest coverage, cost of investigation of firm's prospects and the probability of reorganization upon default²⁶. Bradley, Jerral and Kim²⁹ concluded that leverage increased with increase in extent of regulation as predicted by the agency models. Bradley, Jerral and Kim²⁹ also found that leverage increased with the increase in liquidation value. Kim and Sorenson³⁰ supported that leverage is directly related to the amount of managerial equity ownership. In contrast, Friend and Lang³¹ found no such correlation between the leverage and the amount of managerial equity ownership.

Conclusion

Contrast between the traditional trade-off theory and pecking order theory has been challenged by many researchers. Fama and French⁴ discovered that some firms track traditional trade-off theory while others the pecking order theory but none of them can be rejected. It is not concluded whether debt has any tax benefit on balance or not. Mackie-Mason¹⁴ shows tax-paying firms favor debt. Long-term debt is significantly dependent on firm's efficient marginal tax¹⁵. On the contrary, as Fama and French¹⁶ discovered there is not any net tax benefit in debt and in equilibrium, debt is along bad news about profitability that override interest tax shields or other benefits of debt. As a conclusion, it can be said the stock price is increased with the debt issuing announcement and falls after equity issuing announcement. Agency models predict that leverage is positively related to the firm value, default probability, free cash flow, extent of regulation, liquidity value, interest coverage, cost of investigation of firm's prospects and the probability of reorganization upon default. On the other hand, leverage seems to have inverse relationship with growth opportunities and the importance of managerial reputation. Kim and Sorenson³⁰ supported that leverage is directly related to the amount of managerial equity ownership. In contrast, Friend and Lang³¹ found no such correlation between the leverage and the amount of managerial equity ownership.

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