

# CAPITAL STRUCTURE DECISION – THEORETICAL UNDERPINNINGS AND EMPIRICAL EVIDENCES

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**Abstract** *The objective of the paper is to survey the theories on the capital structure with objective to ascertain whether the capital structure decision is relevant for a firm. The theoretical underpinnings have been surveyed from the theory of irrelevance by Modigliani and Miller to recent theories like Pecking order and Market Timing theory of capital structure. The theoretical underpinnings have been substantiated with empirical evidences from developed and developing economies.*

**Keyword:** *Capital Structure, Value of Firm, Theory of Irrelevance, Pecking Order*

## INTRODUCTION

The capital structure of firm is in the left side of the balance sheet. The debatable question in the academic world of corporate finance is whether the structure of left side of balance sheet has any impact on the value of the firm, whether firm can optimize its capital structure and the more relevant question is whether there exists an optimal capital structure for the firm. The optimal capital structure is one which maximizes the value of the firm by lowering the average cost of capital, but it remains a question whether any optimal capital structure exists which firms can pursue to achieve maximum value for the firm. This is very relevant question for a firm as to how a firm should manage its financial policy. Modigliani and Miller (1958) wrote a seminal paper on the irrelevance theory of capital structure and argued that in the perfect capital market, the decision of capital structure was irrelevant and did not affect the value of firm. This theory since then has been criticized, modified, improvised and new theories like pecking order theory by Myers (1984) and market timing theory of capital structure by Baker and Wurgler (2002) have been proposed to better explain the relevance of capital structure decision. The empirical literature has either substantiated or refuted these theories. In the first section, paper surveys the seminal papers on the theories of capital structure and in the second section, empirical findings from developed and developing countries have been examined. The last section concludes the literature survey.

## THEORETICAL UNDERPINNINGS

This section reviews the four widely acknowledged theories of capital structure viz., Irrelevant theory of capital structure by Modigliani and Miller (1958, 1963), Trade-off theory of capital structure, Pecking order theory of capital structure by Myers (1984) and Market timing theory of capital structure by Baker and Wurgler (2002).

### Irrelevance Theory of Capital Structure

The capital structure irrelevant theory of Modigliani and Miller (1958) proposed that capital structure decision has no impact on the value of the firm making the assumptions of some homogenous expectations of investors regarding the future stream of returns from firm. Based on this, a firm can belong to an investment category, and under the perfect market conditions, two commodities with perfect substitutes of each other must sell at same price in equilibrium. They proposed three propositions while neglecting the taxes. Proposition 1 says that market value of the firm is independent of its capital structure and the value of firm depends only on two things- one being the expected return and second being the capitalization rate. The capitalization rate will depend upon the category a firm belongs to, which will be based on the expected return. This will happen due to the process of arbitrage, in which an individual would try to maximize his personal gain by arbitrage opportunity available in capital market. Proposition 2 provides that if proposition 1 holds

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true then cost of equity capital is linear increasing function of debt/equity ratio and the cost of equity will increase as the firm resorts to debt financing and individual investor will also lever his position by incorporating debt in his portfolio. They assumed similar rate of interest of debt for both individual and corporate investors. Proposition 3 says that regardless of financing used, the marginal cost of capital to firm should be equal to the average cost of capital which is capitalization rate for an unlevered stream of cash flows in the category to which the firm belongs.

The assumptions of this model, like no transaction cost, no taxes, symmetric information, no agency cost or frictions in the market, have been criticized (Modigliani and Miller, 1963; Jensen and Meckling, 1976; Myers, 1984). Modigliani and Miller (1963) revised their model with relaxation of assumption of no tax in the perfect market. The modified version by them introduced the effect of “tax shield” and hence the tacit admission that the capital structure affects the value of the firm. In their own words, “*the deduction of interest in computing taxable corporate profits will prevent the arbitrage process from making the value of all firms in given class proportional to their expected return generated by their physical assets*”.

### Trade-off Theory of Capital Structure

The trade-off theory has been developed by various authors as a consequence of debate over Modigliani-Miller theorem. This theory’s main proposition has been that a firm evaluates various costs and benefits of alternative capital structures (with different leverage position). We will discuss here both static and dynamic version of trade off theory of capital structure.

The static trade off theory says that firm has optimal capital structure which is determined by trading off costs against the use of it. Debt though provides tax advantage but has cost in the form of financial distress associated with it. This leads to trade-off between tax benefits and financial distress cost. The other cost involved is agency cost. Agency costs occur due to conflict of interest between different stakeholders of firm due to asymmetric information (Jensen and Meckling, 1976; Jensen, 1986). So the firms target their capital structure as a trade-off among various costs and benefits like tax advantage, financial distress and agency cost.

Warner (1976) questioned whether bankruptcy costs are large enough to be significant. Myers (1977) argued that trade-off theory is ‘*not complete and sensible explanation of corporate debt policy*’. He assumed that firms are valued as going concerns and their valuation reflects the expectation of continued future investment. According to his theory, there is no direct relationship between debt financing and financial distress cost. The extent of leverage in the firm is inversely

related to ratio of discretionary expenditures to total asset value.

The dynamic trade-off theory recognizes the role of time. This theory considers that the correct financial decision depends on the financing margin that the firm anticipated in the next period. Kane *et al.* (1984) and Brennan and Schwartz (1984) provided dynamic trade-off models with tax savings and bankruptcy costs. They analysed continuous time models with uncertainty, taxes, bankruptcy cost. They assumed no transaction cost for financial decision making. According to them, firms react to adverse financial conditions and rebalance their debt position and maintain high levels of debt to gain tax savings. Goldstein *et al.* (2001) and Brennan and Schwartz (1984) considered this situation as option value embedded in leverage decision for the next period. So firms with an option to increase leverage in the future tend to move away from optimal capital structure today. The dynamic trade-off models of capital structure well explain the empirical reality that most of the firms don’t operate on optimal capital structure level.

### Pecking-order Theory of Capital Structure

The pecking order theory proposed by Myers and Majluf (1984) and Myers (1984) suggested the hierarchy of firm preferences with regard to the financing of their investments and there is no well-defined target debt ratio. Firms prefer internal financing resources over the external financing resources. They assumed perfect financial markets but with information asymmetry. The fact that equity issue leads to fall in stock price and debt issue, does not imply that valuation error is less in debt financing than equity financing. Issuing debt minimizes information advantage to corporate managers. This leads to pecking order in financing, that is, firms prefer internal to external finance, dividends cuts are not preferred to finance expenditures, when external finance is required debt is preferred over equity, and each firm’s debt ratio reflects its cumulative requirement for external financing. The theory explains why firms resort to debt financing even though it causes financial distress. The main criticism of pecking order theory is that it does not show how information differences can affect financing.

### Market Timing Theory of Capital Structure

The market timing theory of capital structure argues that firms time their equity issue. They issue new stock when the stock prices are perceived to be overvalued and buy back their own shares when there is undervaluation. Graham and Harvey (2001) found in a survey of CFOs that two-third agreed

that the amount by which stock is under/overvalued is an important criteria while making equity issue announcement. According to the rational economic agent's assumption, firms issue equity after positive information is released in the market and this reduces the information asymmetry between potential investor and management. Baker and Wurgler (2002) assumed irrational economic agent. Due to this managers issue equity only when it is considered that it cost is irrationally low. They showed that low leverage firms were those which have raised funds when their market valuations were high compared to high leverage firms which raised funds when market valuations were low. The leverage is strongly negatively related to measure of historical market valuation. Thus past market valuation has strong effect on the present capital structure of the firms.

The theoretical analysis shows that Modigliani and Miller (1958) proposed theory of irrelevance of capital structure decision in perfect capital markets but Modigliani and Miller (1963) made tacit admission that there is effect of tax which results in increase in value of firm with incorporation of debt. What level of debt should a firm incorporate? The literature mentions trade-off between cost of bankruptcy and tax benefits. Myers and Majluf (1984), and Myers (1984) argued that there is no definite target debt level but hierarchy of funds. Firms prefer internal source and then debt and in the last, they prefer to issue equity. But market timing theory by Baker and Wurgler (2002) suggested that it is market timing and risk premia associated with equity issue that decides whether firm would prefer equity or debt source. The theoretical underpinnings have been tested empirically in both developed and developing countries with different financial systems. A brief discussion on empirical literature is provided in next section.

## EMPIRICAL EVIDENCES

The empirical literature on the decision of capital structure by firm examined applicability of capital structure theories to predict level of debt in the firms. The empirical research question intended towards twin issues, first being related to 'what' can best explain the existing capital structure decision that is, testing theoretical models in empirical world. The second issue is determinants of capital structure. The literature has identified several variables like size of the firm, cost of borrowing, cost of equity, profitability of firm, expected growth rate of firm, value of tangible assets, liquidity, and non-debt tax shield known to predict the level of debt in the firm. The capital structure theories explain direction of determinants in order to ascertain the optimum level of debt for firm. A brief review of expected sign of each determinant in capital structure theory has been provided by Chen (2004). He has shown from the existing literature that highly profitable large size firms will have lower debt ratio

in pecking order theory but higher debt ratio with trade-off theory. The empirical literature provides contradicting evidence on the applicability of theoretical models in context of industry, region, culture, and legal framework of different countries.

Modigliani and Miller (1963) and trade-off theories later proposed the relevance of capital structure decision due to presence of taxshield for debt. The level of debt is determined by cost-benefit analysis for tax considerations and bankruptcy cost. The positive effect of taxshield confirms trade-off theory. The effects of tax shield on capital structure have been empirically examined by the researchers and have found the contrary results. DeAngelo and Masulis (1980) argued that existence of large tax shields relative to expected cash flows would induce firms to use less borrowed funds. There is expected negative relation between level of debt in firm and non-debt tax shield. Masulis (1993) estimated the impact of change in debt level on firm value. He examined two forms of capital structure changes on the firm value-issuer exchange offers and recapitalizations. He found that the tax-based theories of capital structure are valid, as positive debt level information effect were observed on the value of the share. Boquist and Moore (1984), Hatfield *et al.* (1994) and Fama and French (1998) found no inverse relation between tax shield ratio and leverage ratio. Boquist and Moore (1984) attributed the difference in findings due to methodological differences and variable choice. Hatfield *et al.* (1994) found that firms do not seek optimum debt level as theoretically proposed by trade-off theories. Fama and French (1998) found that dividends and debt convey information about profitability and this obscures any tax effects of financing decision.

In the literature, the firm related variables are regressed on the level of debt for either in cross-section or in panel data form to study the determinants of capital structure and applicability of theoretical models. Titman and Wessels (1988) empirically found that firms with unique/specialized products have lower debt ratio. Also, smaller firms tend to use more short-term debt as compared to long-term and convertible debt. They found no relation between debt level and expected growth rate, non-debt tax shield, volatility or tangible asset value. Further profitable firms employed more debt. Shyam-Sunder and Myers (1999) empirically analysed theories of static tradeoff and pecking order model. With the statistical powers of the tests, they found that the pecking order model is more powerful than the static trade-off model. Regarding the relationship between size of firm and level of debt, Chung (1993) argued that large firms have lower agency costs associated with asset substitution and underinvestment problems. Ozkan (1996) argued that smaller firms are more likely to be liquidated when they are in financial distress. Benito (2003) explained capital structure decision of firms while applying trade-off theory and pecking-order theory.

Since two approaches propose contrasting relationship between debt and cash flow and investment, he proposed that firms targeting capital structure with different level of free cash flow and investment requirement will have different signs for coefficients for these two variables in both theories. He found that pecking order theory better explains the capital structure of the firms. The results show that higher cash flows or profitability lead to less leverage ratio, that is, firms resort to inexpensive internal funds. He incorporated asymmetric information hypothesis by considering firms in two financial systems with bank-dominated financial system in Spain and market-based financial system in UK. Even with considering information asymmetry being less in Spain, the results favour pecking order theory. Gaud *et al.* (2003) studied determinants of capital structure for Swiss companies for the period 1991-2000 using panel data regression. The results show that size of company, tangible assets, and business risk are positively related to leverage whereas growth and current profitability are negatively related to leverage. There is short-term pecking order behaviour towards target ratio. Muradoglu and Sivaprasad (2006) linked the empirical corporate finance issue with investment analysis. They found that the low-debt companies have significant abnormal returns, which are extremely high for small companies.

Empirical studies have found the effect of imperfections in the capital market on the debt levels and value of the firm. A firm can take the advantage of the imperfections in the capital market only if it senses the need of the class of investors for whom perfect investment alternative is not available. But firm's chance to take advantage is limited to the extent that it is among the first ones to issue the debt instrument. Murphy *et al.* (1975) studied the relationship between the capital structures of two firms within a single risk class and their market values. The change in capital structure generally alters the absolute market value of firm, if firm's change in capital structure creates a new type of bond which had not been previously traded in the market. The market timing theory of capital structure proposes that market-to-book value of firm plays significant role in decision to issue equity. Hovakimian *et al.* (2004) examined the case of dual issue firms from perspective of trade-off, pecking order and market timing theory. They found that market-to-book ratio plays important role as high market-to-book ratio firms have good growth opportunities and hence low target debt ratio. This raises the chance of issuing equity than debt. Further, profitability has no effect on target leverage. The unprofitable firms to offset their accumulated losses tend to issue equity than to issue debt. There is evidence of preference of internal financing with reference to time the market that is, selling new equity when share price is relatively high along with maintaining target debt-to-equity ratio. Leary and Roberts (2005) examined whether firms engage in dynamic rebalancing of capital structure. They found that adjustment cost have implications on capital

structure decision. They were of the opinion that earlier findings of persistent effects of shocks on leverage can be due to adjustment cost than indifference towards capital structure. Strebulaev (2007) explored the empirical implications of behaviour of leverage of firms in the dynamic economy. He also questioned the dynamic trade-off applicability. Huang and Ritter (2009) analysed time series patterns of external financing decisions among publically-traded US firms in context of trade-off theory, pecking order theory and market timing theory. They found that results were more consistent with market timing theory. Firms tend to resort to equity financing when expected risk premium is lower. Further, firm's historical equity risk premia has long-lasting effect on leverage as impact of equity financing on leverage reduces only gradually. The speed of adjustment varies from 17.0% per year for book leverage and 23.2% per year for market leverage. Only during the high equity risk premium period, for instance, 1974-84, firms behaved as if following pecking order model. Kasbi (2008) examined market timing theory of capital structure. Using decomposition of market-to-book ratio into misevaluation and growth opportunities, he found negative relation between historical market-to-book ratio and leverage cannot be only due to growth opportunities. It also reflects persistent impact of past timing attempts. Frank and Goyal (2009) studied publically-traded US firms to ascertain the factors that plausibly have reliable relation with market-based leverage. They found that industry leverage (+ effect), high market-to-book ratio (- effect), tangible assets (+ effect), profit (- effect), size (+ effect), and inflation (+ effect) have significant relationship with capital structure of the firm. Trade-off theory provides better explanation to examine the effect of these variables as compared to others.

According to Godfred (2009), financial markets in the developing countries are characterised by more information asymmetry and hence level of debt is generally high in companies from developing countries. Chui *et al.* (2002) examined the effect of country culture on the adoption of debt policy by firms. Using a sample of 5591 firms across 22 countries, they found that countries that are high on conservatism and mastery tend to have low debt ratios.

Chen (2004) studied determinants of capital structure among Chinese firms. They found that neither pecking order nor trade-off theory in their traditional form explains capital structure decision of Chinese firms. These firms seem to follow 'new pecking order' as retained profit, equity and long-term debt. Deesomsak *et al.* (2004) studied determinants of capital structure in Asia-Pacific countries, namely, Singapore, Thailand, Malaysia and Australia. The study reported positive effect of size and negative effect of growth opportunities, non-debt tax yield, liquidity, and share price information on leverage. Further, capital structure decision is not only result of firm-characteristics but corporate governance, legal framework and institutional

environment in which firm operates. The trade-off theory is more applicable in explaining the firm's specific determinants of capital structure.

Huang and Song (2006) analysed the capital structure of Chinese firms. They found that leverage ratio decreases with profitability and increases with size. Quick sale growth firms tend to have higher leverage ratio than high growth opportunity firms. Further, higher state shareholding firms have lower debt ratio. Chinese firms tend to have lower long-term debt component as compared to short-term debt component as most firms enjoy high stock price when they go for equity financing and also due to weak bond market in China. The empirical evidences support trade-off theory than pecking order. Ebaid (2009) examined the effect of level of debt on firm's performance in listed companies in Egypt. He found negative effect of short-term and total debt on return on assets but no effect of long-term debt.

Chowdhary and Chowdhary (2010) tested the influence of debt-equity structure on the value of shares in Bangladesh. They found the positive relationship between the two. Cheng *et al.* (2010) investigated the existence of level of optimal capital structure using advanced panel threshold regression model of Hansan for Chinese listed firms for the period of 2001-2006. The results confirmed the existence of inverted 'U-shaped' correlation between leverage and the value of the firm. Chen and Chen (2011) applied pecking order theory to test the debt decision of Taiwanese firms for the year 2009. They found that firms prefer to use their earnings to finance business activities and thus use less debt capital. Nawaz *et al.* (2011) examined the effect of capital structure decision on firm's performance in Karachi stock exchange listed companies. They found positive effect of incorporation of debt on firm's performance.

Pratheepkanth (2011) found negative relation between leverage level and performance of firms in Srilanka. Chinaemerem and Anthony (2012) examined the effect of capital structure on firm performance on 30 Nigerian companies. They found negative effect of debt to equity ratio on return on assets and return on equity. Al-Qaisi and Shubita (2013) found negative relationship between firm profitability and debt level in listed companies of Palestine for the period 2003-07. They found that listed companies of Palestine generally have low leverage ratio and their long term debt is almost negligible. Bayrakdaroglu, Ege and Yazici (2013) tested the pecking order theory and trade-off theory to explain the capital structure of Turkish companies. Using panel data approach for the period 2000-2009, they found that trade-off theory does not explain the debt behaviour of companies where as pecking order theory is more valid in case of Turkish firms. Chieh (2013) surveyed Taiwanese firms to study the effect of capital structure decision on firm performance through the channel of corporate innovations. He found that capital structure has positive effect on firm

performance as measured through Balanced score card and also the corporate innovation channel does plays its role.

In India, Dhankar and Boora (1996) empirically tested whether any optimal capital structure exists in Indian case. According to them, there is no definite relationship between change in capital structure and the value of the firm. The same have been confirmed by Majumdar and Chhibber (1997). They did cross section analysis of the capital structure of 1000 firms in India in one of the years between 1988 and 1994. They also found the negative correlation between leveraged firm and the value of the firm. They cited the reason for this as the government regulated Indian debt markets. Babu and Jain (1998) conducted primary survey on Indian firms to know their preference of financing sources. The study found that there exists pecking order hypothesis and managers prefer internal to external financing. Debt is still considered as relatively cheaper source of finance and long term debt is preferred by Indian firms. Bhole and Mahakud (2004) analysed the trends in the corporate capital structure in India for both public and private limited companies. They found that leverage ratio for type of companies increased significantly during the period 1966-2000. The public limited companies are more dependent on debt than private limited companies. They found that large firms have higher debt ratio as they can manage bankruptcy cost better than small firms. Also high debt firms are less profitable and have less growth though statistically insignificant. Bhaduri and Majumdar (2005) argued that in the emerging economies like India, bank and public debt need to be considered separately as India has hybrid model of financial system. They studied the determinants of corporate debt structure among non-financial India firms. The major source of long-term finance in India is banking debt. It is negatively related to age, size, volatility of earning growth and leverage and is positively related to level of tangible assets in the firm. For the Indian firms, agency-theoretic and information-based models of capital structure are applicable. Rajagopal (2005) examined the applicability of models of capital structure in context of India. He found that explanatory variables like fixed asset ratio, firm size, profitability, market-to-book ratio, non-debt tax shield and earnings volatility are valid in explaining cross-sectional variation in financial leverage with expected signs.

Mukherjee and Mahakud (2010) tested dynamic trade-off theory of capital structure for Indian manufacturing companies for the period 1993-94 to 2007-08. They examined both firm specific characteristics and time specific factors on target leverage. They found that results were consistent with dynamic trade-off theory and has implications for managers that they should consider various adjustment costs while altering financing structure of the company. Azhagaiah and Gavoury (2011) analysed effect of capital structure decision on the profitability of Indian IT firms for the period 1999-

00 to 2006-07. They divided the firms into groups based on business revenue and size. They found that increase in debt-to-equity ratio tends to decrease net earnings relative to capital employed. Further, profitability measured by return on capital employed is significantly negatively affected by used of debt for small size firms. The large IT firms tend to employ less debt in their capital structure. Thus study reported negative influence of incorporation of debt on profitability in IT industry in India. Pathak (2011) examined the relation of major determinants of capital structure with leverage ratio among Bombay stock exchange listed Indian firms. The results indicate that size, tangibility, and growth rate has positive relation with leverage ratio. Decline in business risk, profitability and liquidity lead to increase in leverage ratio. Adhegaonkar and Indi (2012) examined the capital structure decision in India and found that tangibility, non-debt tax shield and interest coverage ratio has linear relation with capital structure.

The empirical findings of developing countries differ from developed countries as pecking order is different in particular in China and India. The trade-off theory and pecking order theory has been found to be more relevant in case of developing countries.

## CONCLUSION

The paper attempted to analyse the theories related to capital structure and the empirical evidences on to what extent theories are relevant in real world. The modern theory of capital structure started with paper by Modigliani and Miller (1958) which proposed that in perfect financial market, financing decision is irrelevant. They modified their own theory by incorporating tax savings on debt and proposed that capital structure affects the firm value. Many authors motivated by this proposition attempted to find that if debt is desirable then why not many firms resort to large values of debt in their capital structure. The trade-off theory of capital structure proposed that it is cost-benefit decision and debt is incorporated to the extent that financial distress cost and agency costs are minimized. Dynamic trade-off theory proposed that firms chase optimum capital structure and adjust their capital structure with market conditions. Thus capital structure decision is futuristic and firms maintain that level of debt which can provide them the option to avail favourable market conditions. The only cost which needs to be considered is the adjustment cost. The pecking order theory proposed that capital structure decision is hierarchal and firms prefer internal financing to external and debt to equity in order. The market timing theory extended dynamic trade-off theory but it proposed that capital structure decision is backward looking and historical leverage and valuation affect the capital structure decision. Firms time the market and issue equity when it is beneficial to do so. The empirical

results show that capital structure does affect the value of firm and there is reportedly positive as well as negative effect of debt on firm's profitability. The empirical testing of theories provides evidence that dynamic trade-off theory and market timing theory capital structure well explain the financing decision of firms.

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