CHAPTER I

THE DETERMINANTS OF CORPORATE CAPITAL STRUCTURE

Review of Literature - Theoretical Background

1.1 INTRODUCTION

The Capital Structure problem deals with the firm's choices of the types of securities to issue. The theories that seek to explain how the financing mix is determined can be classified into three basic groups.

1) Frictionless market theories, which share the assumption that individuals and firms can buy and sell securities without incurring transaction costs.

2) The "Financing hierarchy" or "Pecking Order" theory, under which notion, internal funds are preferred by firms, up to a point, and thereafter debt financing and finally external equity. Thus the debt issuance at any time period depends on the investment opportunities and the internal funds.

3) The cost of transaction theories, where the initial advantage to debt financing is countered by increased costs of transaction associated with issues of the securities and the bankruptcy risk associated therewith. Each firm thus tries to optimise the debt level which depends on such factors as its business risk, the potential severity of the
share-holder and bondholder conflicts, the proportion of its assets suitable for use as collateral and its own specific attributes determined internally.

1.2 REVIEW OF THE LITERATURE ON THE VARIOUS THEORIES THAT HAVE DEVELOPED

1.2.1 FRICTIONLESS OR PERFECT MARKET THEORIES

Frictionless markets refers to markets where there are no costs incurred in making transactions in any market. In particular, there are no information costs, brokerage fees and other costs associated with the purchase or sale of securities or other assets. Modigliani and Miller (1958) first presented their seminal theory based on such perfect markets and proposed their "Capital Structure Irrelevance Theorem". This theory was based on a no-taxation valuation model under which in the absence of corporate taxes, the market value of the firm's share price is independent of the capital structure of the firm i.e the debt-equity mix. This was followed by Modigliani & Miller (1963) tax-corrected valuation model according to which, Modigliani and Miller further proved that if corporate taxation is introduced into the capital structure, their earlier theory will stand slightly amended only to the extent of taxation involved. In other words, the extent of gain from corporate leverage is directly proportional to the proportion of the debt in the capital structure. The theories are covered in detail later
on. Miller (1977) in his presidential address to the American Finance Association presented yet another "Debt & Taxes" general model for a world with both personal and corporate taxation. This model, unlike other models, hypothesizes an optimal debt-to-equity ratio for the market as a whole. As per this model incomes of investors is distributed across various tax brackets, while that of the corporate sector is fixed. The tax bracket of the investor hence influences his preference for the different types of securities offered by the firm and hence the investment made by him in corporate securities. The companies thus face varying demand for their securities from these investors and hence will have to change the debt-equity mix to cater to the demand. There thus will exist some optimal capital structure which will reflect the distribution of aggregate savings across the spectrum of personal tax brackets. De Angelo and Masulis (1980) introduced the idea of tax shelters, where they derive a theory of optimal capital structure as a result of the trade-off between the cost of bankruptcy and the tax benefits accruing due to a firm's utilisation of non-debt tax credits (such as investment tax credits).

1.2.1. CAPITAL STRUCTURE AND MARKET VALUES

The effects of the financing decisions of firms on the market values of their securities is analysed in the context of the entire process by which the equilibrium holdings and prices of holding by all investors in all firms
are simultaneously determined in the capital markets. Fama & Miller (1972) adopt an equilibrium two-period model for the analysis in contrast to the highly specified "states of the world" model of Arrow (1964), Debreu (1959), Hirschleifer (1966) and others and the original "risk class" model of Modigliani and Miller (1958).

All the three models are set in the background of a perfect capital market, which is defined as under:

1. The capital market is frictionless in the sense that all securities are infinitely divisible, information is costless and available to everybody, and there are no transaction costs and taxes.

2. All financial arrangements available to firms are equally available to individuals; that is, any claims that a firm can issue at period 1 against its probability distribution of market value at period 2 can also be issued by any investor who holds an equivalent distribution.

3. In choosing among available probability distributions on market value at period 2, investors are not concerned with whether a distribution is issued by an individual or a firm.

4. Investors perceive that there are always perfect substitutes for any securities issued by an individual investor or firm, and individual investors and firms are "atomistic competitors:"

5. Investors are assumed to protect themselves against any sort of "financing decisions" by individuals or firms that have the effect of expropriating their positions without appropriate compensation.
Variable $I_i$ is the return on shares issued by any firm $i$ which is perfectly correlated with the return on the shares issued by any other firm $j$ in the same risk class.

i.e. $I_i(t) = Y_{ij} I_j(t)$ \ldots \quad (1)$

where $Y_{ij}$ is the proportionality factor
Modigliani & Miller (1958) theorize that for any given set of operating decisions by firms at period 1, when the capital market is perfect, the equilibrium total market value of any firm at period 1 is unaffected by its financing decision. Modigliani & Miller derive the market prices of a firm's securities by comparing them with prices of identical positions in other firms of the same risk class.

Two firms $i$ and $j$ are in the same risk class if for all $t$,

$$X_i(t) = Y_i X_j(t) \quad \text{and} \quad I_i(t) = Y_i I_i(t) \quad \ldots \quad (1)$$

where $X_i(t)$ and $X_j(t)$ are the net cash earnings, before interest, of the firms at $t$, and $Y_i$ is the proportionality factor. Thus they assume that the return on the shares issued by any firm in any given class is perfectly correlated with the return on the shares issued by any other firm in the same class. Accordingly, if the difference in scale is adjusted, by taking the ratio of the return to the expected return, the probability distribution of that ratio is identical for all shares in the class. The shares of firms are thus uniquely characterised by the class to which it belongs and the expected return.

From the above definition of homogeneous risk class, it follows that the price of a share must be proportional to its expected return. If this proportionality is denoted for any class $k$, by $1/P_k$, then, if $P_j$ denotes the price and $X_j$ the expected return per share of the $j$th firm in class $k$, then according to Modigliani & Miller,

$$P_j = 1/ P_k X_j \ldots \ldots \ldots \ldots \ldots \ldots \ldots (2).$$
i.e. \( X_j/P_j = P_k \) a constant for all firms \( j \) in class \( k \).

\( 1/P_k \) is nothing but the price an investor is willing to pay for a unit of expected return in class \((k)\) and \( P_k \) is the expected rate of return of any share in class \( k \) and in case of perpetual bonds, the market rate of capitalization of the expected value of the uncertain streams generated by the \( k \)th class of firms.

Introduction of debt in the capital structure of firms, gives rise to different probability distribution of returns, even for firms of same the risk class. If \( D_j \) is the market value of the debts of the firm, \( S_j \) is the market value of its common shares, and \( V_j \) the total market value of the firm, then \( V_j = S_j + D_j \), the three propositions put forth are

i) \( V_j = (S_j + D_j) = X_j / P_k \) \( \ldots \ldots \) (3)

for any firm \( j \) in class \( k \)

i.e. the market value of the firm is independent of its capital structure and is given by capitalising its expected return at the rate of \( P_k \) proportion to its risk class.

ii) \( X_j/(S_i + D_i) = X_j/V_j = P_k \) \( \ldots \ldots \) (4)

for any firm \( j \), in class \( k \), i.e. the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class.

The cut off point for investment in the firm will in all cases be \( P_k \) and will be completely unaffected by the type of security used to finance the investment.
The relation between leverage and cost of capital is depicted in figure 1.1. Initially, as more and more debt is added, the average cost of capital will start to decline due to the fact that the interest on debt being interest bearing, the firm will be entitled to tax deductions of interest expense, which will reduce effective cost of capital. As more and more debt is added, however, a point will be reached (S) wherein, the shareholders will, due to their having a limit to risk taking capacity, demand higher returns to them (by way of pay-out/dividends, etc.,) which will increase the average cost of capital. The bottom of the trough (S) would be the theoretical optimal level of debt a firm would desire to have without increasing the cost of capital to shareholders.

The second line in the graph, MM is the Modigliani-Miller position when there are no taxes and there will be no effect on cost of capital when debt is introduced in the capital structure.
Even if one considers the wide spectrum of prevailing interest rates for borrowing funds, economic theory and market experience suggest that the yields demanded by lenders tend to increase with the debt-equity ratio of the borrowing firm, and if this yield curve, $r = r(D/S)$, is the same for all borrowers, in the MM situation while the rate of interest (average cost of borrowed funds) may rise with leverage, the average cost of funds from all sources will still be independent of leverage (apart from the tax effect). This conclusion follows directly from the ability of those who engage in arbitrage to undo the leverage in any financial structure by appropriately mixing their portfolio of stocks and bonds. Because of this ability, the ratio of earning (before interest charges) to market value (i.e. the average cost of capital from all sources) must be the same for all firms in a given class. In other words the increased cost of borrowed funds as leverage increases is offset by a corresponding reduction in the yield of common stock.

The relation between leverage and the cost of capital is depicted in the figure 1.1.

Figure 1.2 explains the relation between the expected yield on common stock to leverage. If $r$ increases with leverage, the yield $i$ will still tend to rise as $D/S$ rises, but at a decreasing rate. Beyond some level of leverage, the yield may start to fall. The relation
Figure 1.2 explains the relation between expected yield on common stock to leverage. In the absence of taxes, as more and more debt is introduced into the capital structure, the shareholders would demand compensation for risk (bankruptcy) due to leverage and in effect the price of stock will automatically adjust to provide for the demand. If \( r \), the expected return to lenders, will increase as debt-equity ratio increase, as yield demanded by lenders increase, according to market experience. The line ML' is the position of risk free return to shareholders and MM' shows the increase in yield to them as added risk premium for using debt. As \( r \) (return to lenders) also increases with leverage along with \( i \) (return to shareholders) there will be trade off between the yields and beyond some point, the yield to shareholders \( i \) will begin to drop. This is depicted by the curve MD.
Ratio of Expected return to Market Value

\[ x_j / v_j \]

Average cost of capital

Ratio of Debt to Total Market Value \( D_j / V_j \)

Figure (1.1)

Expected Yield on Common Stock

Debt to Equity Ratio \( D_j / S_j \)

Figure (1.2)
would take the form as shown by the curve MD. The relation between yield and leverage would hence be linear (MM') in contrast to the constant relation in case of the fixed interest (uniform) interest case.

Introduction of taxes (MM 1963) changes the expected returns to investors and if \( p_t \) is the rate at which the market capitalises this return of an unlevered firm, of size \( X \) in class \( k \),

\[
P_t = (1-t) \frac{X}{V_u} \quad \text{(5)}
\]

or

\[
V_u = (1-t) \frac{X}{P_t} \quad \text{(6)}
\]

If \( r_B \) is the rate at which the market capitalised the sure streams generated by debt (interest on bonds),

\[
r_B = \frac{R}{B} \quad \text{or} \quad B = \frac{R}{r} \quad \text{(7)}
\]

If the firm has a permanent level of debt \( B \) in its capital structure, then the value of the levered firm 'j', \( V_j^L \) is given by

\[
V_j = (1-t)X/r_B = tR/r_B = V_j^U + tB_j \quad \text{(8)}
\]

Hence the tax advantage of debt is due solely to the fact that deductibility of interest payments implies a higher level of after-tax operating income for any given level of before tax earnings, by an amount given by \( tB \).

Miller (1977) in a subsequent version, has modified his earlier stand and argued that if personal taxes is introduced into the earlier equation, under market equilibrium conditions, even in the presence of personal and corporate taxes, capital structure choice would remain a matter of indifference to its owners. However, unlike in the cases considered there far, there is an optimal debt-equity
ratio in the market as a whole. This optional aggregate capital structure will in turn, reflect the distribution of aggregate savings across the spectrum of personal tax brackets.

Testing their own theory on Electric & Oil (Utility) industries (assumed as homogeneous risk class), Modigliani and Miller found the influence of leverage on the cost of capital to be insignificant. When common stock yield was regressed against leverage, positive and highly significant correlation coefficients were obtained for both industries.

The departure of the propositions from real world conditions lies on their assumption of a perfect market and no growth, though the latter is not explicit. Implied in their agreement is that price has been assumed to equal book value (as long as book value is defined in terms of replacement value) David Durand (1959) was one of the first to counter their theory by drawing its irrelevance to actual situations, where prices may differ greatly from book values and that "growth" which is inherent in most corporations was completely ignored. But MM argued that "the essence of growth" is not expansion, but the existence of opportunities to invest significant quantities of funds at higher than normal rates of return. But since growth, so defined, depends on monopolistic advantages for some firms, it is a market imperfection - if only temporary. Even so, it is an imperfection of great practical interest, for the effects of
investing significant quantities of funds at supernormal rates can be dramatic, especially if the opportunities are sufficiently long range.

In Modigliani and Miller (1959), Modigliani and Miller suggested that they could tolerate temporary departures from normal, and in these terms one may rationalize Modigliani-Miller's "monopolistic opportunities" as passing phenomena. In the long run, however, these special opportunities may pass away, leaving all assets earning the market rate and all prices equal to book value. But, in the interim, as research and development creates new opportunities, while competition eliminates old ones, monopolistic opportunities will continue to be the order of the day, and will pose practical problems delimiting the scope for market values to anywhere equal book values.

When Modigliani and Miller introduced personal taxes, they arrived at the equilibrium values for the levered firm as

\[
V_j^L = \frac{X_j(1-t_C)}{1+r_E} \left[ \frac{1}{1+(1+r_B)(1-t_C)} \right] B_j
\]

\[
= \frac{V^u_j}{1+r_E}
\]

(9)

If we substitute \( r_B = r_B^* = \frac{r_E}{(1-t_C)} \)

\[
V_j^L = X_j (1-t_C) = V^u_j
\]

(10)

Miller's equation for tax advantage to debt is given by

\[
V_d = \frac{[1 - (1-t)(1-t_e)] B}{1+t_d}
\]

(11)
t - Corporate income tax rate

t_e - personal income tax rate on dividend income

t_d - personal tax rate on bond income

If the equilibrium interest rate in the bond market
is \( r_B^* \), Miller derives the value of the firm in the presence of tax

\[
V_j^L = X_j(1-t_c) + \frac{1 - (1+r_B^*)(1-t_c)}{1+r_E} - (V_{ju}) \quad \ldots(12)
\]

(Gain from leverage)

where \( r_E \) is the return to the common stock holders (equilibrium common stock yield), \( t_e \) is the corporate tax rate, and \( t_p \) is the personal tax rate. If we substitute

\[
r_B^* = \frac{r_E}{(1-t_p)}
\]

the gain from leverage disappears such that

\[
V_j^L = V_j^U \quad \ldots(13)
\]

Miller argued that, the market valuation of leverage must reflect the personal tax of the marginal holder of corporate debt, and (given the availability of tax exempt securities), the marginal rate must rise continuously as the quantity of debt outstanding rises. If the supply of debt is infinitely elastic and the top personal tax rate exceeds the corporate rate, then in equilibrium, the market value of leverage must be zero.

Miller's thesis, relied on the consideration that, contrary to the MM assumption, the personal taxation of
Bond Market Equilibrium with Corporate Taxes (Miller 1963)

Figure (1.3)

Bond Market Equilibrium with Personal and Corporate Taxes (Miller 1977)

Figure (1.4)
equity returns is typically lower than that of interest and the differential is larger the higher the tax bracket. Now, if the supply of debt has costs, then the demand and supply can only come at a point where debt is valuable at the margin, and therefore leverage is an important issue. Further the existence of tax exempt securities whose rates are determined exogenously and the wide range of rates for both personal and corporate taxes could lead to unstable corner solutions.

DeAngelo and Masulis (1980) utilised the legal limit imposed on a firm's ability to use tax credits to offset taxable income to define a limit on the firm's willingness to use debt financing. According to them, a firm benefits from use of debt as long as it can take advantage of the tax deductibility of interest. They noted that the firm's ability to utilise its investment and other tax credits was limited by the availability of taxable income i.e. the ability to utilise its interest expense as a tax-deductible item depends on the fraction of allowable deductions, the level of the firm's taxable income and the amount of tax-deductible expenses and credits it accrues from its operations (such as depreciation on fixed assets and investment tax credits).

The value of utilised tax credits is given by,

\[ \min \{ Y t_c (X_j - \Delta j - r_B B_j) T \} \] ................................(14)

(due to statutory ceilings on usable tax credits to a fraction Y of the gross tax liability)

where,
\[ \Delta_j \] is the tax deductions resulting from non-cash charges such as accounting depreciation and other tax credits (like investment tax credits from purchase of new plant and equipment),

\[ X_j - r_B B_j \] is the firm's taxable income,

\[ T_j = t_c (X_j - \Delta_j - r_B B_j) \] is the gross tax liability,

If the value of debt is \( B_j^* \), if the firm uses the tax credits fully is then

\[ T_j = Y t_c (X_j - \Delta_j - r_B B_j^*) \] ........................(15)

or \( B_j^* = X_j - \Delta_j - (T_j/Y t_c) \)

\[ \frac{r_B}{1+r_E} \] ........................(16).

All tax credits are fully utilised for all \( B_j \leq B_j^* \), and partially utilised for \( B_j < B_j^* \). Thus the value of the firm if \( B_j \leq B_j^* \) is

\[ V_j = B_j + \frac{X_j - (1+r_B) B_j - t_c (X_j - \Delta_j - r_B B_j) + T_j}{1+r_E} \] ........................(17)

and if \( B_j > B_j^* \)

\[ V_j = B_j + X_j - (1+r_B) B_j - (1-Y) t_c (X_j - \Delta_j - r_B B_j) \]

\[ \frac{1}{1+r_E} \] ........................(18)
As we expect the firm to select $B_j$ such that it maximises its value, $dV/dB=0$ for both cases

i.e. if $B_j=B_j^*$, $dV_j/dB_j=1- \frac{1+r_B(1-t_c)}{1+r_E}$ (19)

if $B_j>B_j^*$, $dV_j/dB_j=1- \frac{1+r_B[1-(1+r)t_c]}{1+r_E}$ (20)

To derive the firm's demand for debt, then, the value maximising level for each $r_B$ should be found.

**Case 1.** If $r_B=r_E/(1-t_c)$.

$dV_j/dB_j=0$ for both cases shown in equations 1 and 2 and all debt levels between 0 and $B_j^*$ are optimal and tax credits are fully utilised.

**Case 2.** When $r_E/(1-t_c)>r_B>r_E/[1-(1-Y)t_c]$

$dV_j/dB_j$ is positive for $B_j=B_j^*$ and negative for $B_j>B_j^*$. Hence $B_j^*$ is the optimal debt level and the firm just utilises its tax credits.

Since $B_j^*=X_j-\Delta_j-T_j/Yt_c$

$r_B$

$B_j^*$ increases as $r_B$ decreases in this range.

**Case 3.** When $r_B=r_E/[1-(1-Yt_c)]$.

$dV_j/dB_j$ is positive for $B_j=B_j^*$ and 0 thereafter and no debt level $>B_j^*$ are optimal.

All the above cases are depicted by means of graphs in the subsequent page.
Firm Valuation and the use of Debt Financing

Case 1. $r_B = r_E / (1 - t_C)$

Figure (1.5a)

Case 2. $r_E / (1 - t_C) > r_B > r_E / [1 - (1 - Y) t_C]$

Figure (1.5b)

Case 3. $r_B = r_E / [1 - (1 - Y) t_C]$

Figure (1.5c)
In the market for securities, the demand for bonds is as shown in Figure (1.5d). The demand and supply curve intersect in the Case 2 region of the demand function and this equilibrium will determine an optimal level for each firm, and firms will fully utilise their tax credits. De Angelo and Masulis showed that in a world where tax credits are limited, there will be an optimal capital structure for the market as a whole, but there will also be an optimal capital structure for each firm. The latter entails use of that level of debt financing for which the firm's total tax credits are the maximum allowable under the tax code.

It is interesting to note that should the equilibrium bond rate occur in the perfectly elastic segment of the demand for bonds \( r = r / (1 - t) \), we get the Miller (1977) result, i.e. there will exist an optimal capital structure for the market as a whole, but no such level for an individual firm.

Researchers following Modigliani-Miller(1958), Miller

We find that there is no tax advantage to any individual firm associated with corporate leverage. If this is so, then the question as to why do firms which seek to maximise shareholders' wealth issue risky debt is to be analysed. At the macro level, there is still an optimal level of aggregate borrowing for the corporate sector as a whole. This optimal aggregate corporate borrowing may be viewed as an optimal trade off between the economy wide tax savings from Corporate borrowing and the economy wide loss of value due to costs associated with risky debt (bankruptcy, etc.) leverage induced sub-optimal investments, and monitoring and bonding costs. It might be argued that some firms issue risky debt due to other competing factors that influence debt decisions viz., financial leverage clientele phenomenon expounded by Kim, Lewellen and McConnel (1979), or the Investment tax credit model of DeAngelo and Masulis (1980), Agency Cost Theory of Jenson & Meckling (1976), Moral Hazard
Theory of Leland & Pyle (1977) & Myers and Majluf (1983), the Pecking Order Theory of Myers (1984), signaling hypothesis of Ross (1979). These theories try to balance the costs associated with debt with the tax advantage of issuing debt and strike to arrive at a theory of optimal capital structure. However as empirical evidence show (covered in more detail later on), the theories only to some extent explain corporate behaviour in taking debt/equity decisions and there are still other attributes specific to each firm which have significant impact on firm borrowing decisions.

1.2.1a LEVERAGE BUYOUTS AND CORPORATE RESTRUCTURING

Through most of this century, corporations were run by professional managers and financed by shareholders who took little interest in corporate governance. This was obviously the result of separation of ownership from management since management owns only a small portion of the shares of the company and since shareholders are not organised to oppose management decisions. The managements were therefore running the corporations to their benefit and the only way for the shareholder to effect any change is to vote with their feet and to sell their shares and buy shares in a company whose management is more to their liking.

The situation today is vastly different with more and more industry restructuring on a massive scale, not only through traditional means of mergers and acquisitions, but through leveraged (debt financed) transactions such as leveraged buyouts, leveraged re-capitalisation, leveraged share
purchases and leveraged cash outs. Not only are new subsidiaries being acquired but those that no longer meet corporate goals are being divested to free cash for other purposes. This restructuring has been brought about partly through increasing competitive pressure and deregulation, but also as a result of corporate financial innovation such as junk bond financing and bridge financing. This practice which became very popular in Europe and the USA has become attractive in developing countries like India also due to the encouragement given for such transactions by the corporate financiers in the investment banking community who have facilitated the corporate restructuring.

Many of the restructuring have broken the link between cash generation in the corporation and re-investment of cash in new projects and acquisitions. Instead, cash generated by existing projects is channeled back to the financial marketplace through, for example servicing payments and reallocation by investors, rather than incumbent management, to those projects that investors choose. This competitive tendency of the management has thus returned corporate re-investment decision to the market place. To foster growth and at the same time achieve better results to the shareholders, managements adopt various strategies such as increasing earnings per share by reducing the number of shares through issue of bonds with buy-back option which is equivalent to issuing debt now to buy back shares later (as the Company Law in India does not provide for buying back of
the company's own shares). This would temporarily increase the debt ratio and make takeover more expensive to the bidder. The price paid for the debt is a function of the risk perceived by those who hold it. This risk is a part of the perceived gearing ratio of the company. Thus obtaining finance for highly leveraged transactions is difficult. However it is possible to raise 'mezzanine finance' for such deals whereby banks syndicate to lend money at the time of takeover and then restructure the debt later on depending on other goals. An alternative method is to use preference shares, although the interest cost is not tax-deductible. This makes such form of financing quite expensive.

1.2.2 FINANCING HIERARCHY/ PECKING ORDER THEORY

Donaldson (1961) found in his study of corporate financing practices of U.S. Corporations that managers had a strong preference for internal funds and felt sudden need for external funds in bulges. Established firms were found to normally avoid new equity issues and borrowing tended to be determined as the residual between desired investment and a relatively inelastic supply of retained earnings. Myers (1984) characterised the behaviour of the firms in his "Pecking Order Theory", Myers theorizes that 1. Firms prefer internal sources of funds their anticipated investment opportunities, although dividends are sticky and target payment ratios are only gradually adjusted to shifts in the extent of valuable investment opportunities.
3. Sticky dividend policies, plus unpredictable fluctuations in profitability and investment opportunities, mean that internally generated cash flow may be more or less than investment outlays. If it is less, the firm first draws down its cash balance or marketable securities portfolio.

If external finance is required, firms issue the safest security first. That is, they start with debt, then possibly hybrid securities such as convertible bonds, then perhaps equity as a last resort. There is thus no well-defined target debt equity mix, because there are two kinds of equity, internal and external, one at the top of the pecking order, and one at the bottom. Each firm's observed debt ratio reflects its cumulative requirements for external funds.

Myers' argument stems from the asymmetric information associated with use of external funds and the costs of relying on debt. Thus the firm faces two increasing costs as it climbs the pecking order: it faces higher odds of incurring costs of financial distress and also higher odds that future positive NPV projects will be passed by because the firm will be unwilling to finance them by issuing common stock or any other risky securities. Myers argues that the firm may choose to reduce these costs by issuing new stock even though it is not needed immediately, just to move the firm down the pecking order.

According to Myers, therefore, an unprofitable firm is likely to have a relatively high debt ratio and if it is high enough as explained earlier, the firm may (or may not)
re-balance its capital structure by issuing equity.

Myers' theory has been able to explain Donaldson's (1961) observation of why firms prefer to finance investments from out of internal funds. It explains why companies keep target dividend payments low enough to avoid having to make regular stock issues and why firms whose debt equity ratios are high do not immediately issue stock or buy back debt. It explains the high performance of stock price movements as a timing variable in cross sectional studies (Marsh (UK,1982), Taggart (USA,1977) in explaining stock issues during periods of high stock performance. It explains Long & Malitz (1983), Williamson (1981) observation that firms holding valuable intangible assets (or growth opportunities) and investment in Research & Development tend to borrow less, and the level of borrowing is positively related to the rate of investment in fixed plant and machinery. Masulis (1980 & 1983) observes that the firm's willingness to exchange debt for equity might signal that the firm's debt capacity had, in management's opinion, increased. That is, it would signal an increase in firm value or a reduction in firm risk. Thus, a debt for equity exchange would be good news, and the opposite exchange bad news. This "information effect" for exchange offers also finds an explanation in Myers theory.

1.4 TRANSACTION COSTS, AGENCY COSTS, ASYMMETRIC INFORMATION, SIGNALING IN A WORLD OF UNCERTAINTY .

While Modigliani-Miller (1958), Miller (1977) argue
in favour of a Leverage Irrelevance Proposition for Corporate debt equity choice, DeAngelo and Masulis (1980) explains existing Corporate behaviour as a result of the firms taking advantage of tax shelters and Myers (1984) conceptualises a 'pecking order' for choosing funds, preferring internal funds first and external equity last. While these theories explain or describe financing practice more or less accurately, none explain why such policy is 'optimal' or even desirable. Jenson & Meckling (1976) first introduced "Agency Costs" as a possible explanation, while Leland & Pyle (1977) first attempted at applying the notion of moral hazard and asymmetric information to the firm's financing choice between debt and equity. Myers and Majluf (1983) offer yet another attempt to develop the implications of asymmetric information for corporate financing decision. While the aforesaid two papers support the firm's preference for internal over external funds as well as for debt over new equity issues, the inherent transaction costs and costs of financial distress associated with risky debt in a real world situation, create the problem of debt limitation. Kraus & Litzenberger (1973), Lee and Barker (1977), Kim (1978), Haugen & Senbet (1978) utilise bankruptcy costs to explain firm's limitations to debt financing.

According to Jenson and Meckling (1976) agency costs arise from differing incentives among claim holders of the firm and as the ratio of debt to outside equity rises, the agency costs associated with debt will increase, but those associated with outside equity will decline. If the
total agency costs (including bankruptcy costs), as a function of the debt-to-outside equity ratio, have an interior minimum, the resulting ownership structure will consist of internal equity, outside equity and debt. Jenson and Meckling define these agency costs to include:

1. the principal's monitoring expenditure (for observing and controlling the agents' behaviour)
2. the agents bonding expenditures and
3. the residual loss suffered from imperfect monitoring (incomplete fulfillment of the contracted task).

Higher the proportion of external financing the greater will be the agents consumption of "perks". There will thus exist a trade-off between the benefits of utilising external finance (such as ability to take advantage of positive NPV investment opportunities that outstrip the firm's ability to finance them through retained earnings) and the added costs of agency associated with increased reliance on such sources. The optimal level of debt financing is that ratio of debt/external equity at which the agency cost is minimised.

Optimal Capital Structure determined by minimising Total Agency Cost
Figure (1.6)
Agency costs of external equity are assumed to decrease as the percentage of external equity decreases and the agency costs of debt are assumed to increase. The figure depicts a case where the agency costs are minimised with an optimal capital structure between 0% and 100% - an interior solution. If the agency costs of external equity are very low, as may be the case for a widely held firm, then optimal capital structure can result as a trade off between the tax shelter benefit of debt and its agency costs.

Titman (1984) suggests that agency costs are important for contracts between the firm and its customers and between the firm and its employees. According to him, firms producing durable goods requiring future services (like repairs, etc) would carry less debt (as customers would assess their bankruptcy probabilities while purchasing the products). So also firms using larger percentage of job specific human capital will also carry less debt. as labourers will charge higher wages in firms that have higher bankruptcy risks, due to costs associated with having to seek alternate employment in the event of firm failure. Scott (1976) shows that optimal leverage may be related to the collateral value of the tangible assets held by the firm, as in the event of bankruptcy debt holders can reduce their loss by salvage value of the property held in the firm. Another method is 'leasing' especially in small firms, as the leased assets are literally the property of the lessor and can be repossessed in the event of default on the lease.
payment. Secured debt reduces debt holders' monitoring costs as secured creditors are less likely to require restructure in loan agreements. More importantly, secured debt makes it advantageous for shareholders to undertake positive NPV projects. According to Shultz & Johnson (1985), secured debt actually increased the value of the firm, rather than merely redistributing wealth among various claim holders.

Leyland & Pyle (1977) use information asymmetry influences to rationalize the existence of financial intermediaries. They argue that not transaction costs but informational asymmetries explain their existence. According to them, information on assets (of individuals and firms) not publicly available, but valuable to potential lenders, would be developed by such financial intermediaries. Availability of information on firms' assets already with financial institutions from whom they have borrowed reduces informational problems and firms would prefer repeated relationship with lenders. Financial intermediaries' willingness to invest/finance firm's investments also serves as some sort of signaling. But this theory does to some extent explain the increased reliance on existing sources of finance by firms (by way of raising additional funds from financial institutions or issue of rights for equity issues in the case of smaller firms which are closely held).

Ross (1977) uses signaling mechanism to deal with information asymmetry. Ross assumes that Managers have information on the firms that outsiders do not have and investors use the face amount of debt or dividends the
Myers and Majluf (1984) in their signaling hypothesis, predict that managers are expected to know more about the firm than the shareholders about the future value of the firm. They establish a rational expectations equilibrium, wherein, issue of new equity shares signals "bad News" to outsiders and the insider (existing shareholder) cannot take advantage of this inside information as the very act will reveal their information to the market, thereby reducing share prices when equity issues are announced. However when positive NPV projects are financed by equity issues which are bad news, the signal now will be mixed. Unless one can separate them, the market will not be able to interpret the issue of equity shares as "good news", and any expected benefits to existing shareholders that may be derived from increase in stock prices, if the signal is interpreted correctly (expansion in positive NPV projects which will add to value) will vanish. The firm can reduce this problem by resorting to financing that is not subject to information asymmetry (i.e. internal funds, secured debt, unsecured debt, convertible debt and equity issues, in that order of preference.) This is again the Pecking Order referred to by Myers (1984) for corporate capital structure.
managers decide to issue as a signal of firm type. With reference to a critical level of debt, the market perceives the firm to be a risky or not risky one. By changing the level of debt, the manager-insider alters the market's perception of the firm's risk and therefore its current value. This process produces a unique optimum level of debt financing for each firm type. Manager of a firm with debt level below critical will not have an incentive to signal falsely that his firm is of type whose debt is above critical level, as the penalty built into the incentive structure would reduce his compensation.

Myers and Majluf (1984) present a signaling model that combines investment and financing decisions that is rich in empirical implications. Managers are assumed to know the "true" future value of the firm and of any project it might undertake. They are assumed to act in the interest of the "old" shareholders who are assumed to be passive (i.e. who do not actively change their personal portfolios to undo the decisions of management). They establish a rational expectations equilibrium wherein, issue of new equity shares signals 'bad news' to outsiders and the insider (original) share holder cannot take advantage of the inside information (when they think the firm is over valued) as the very act of issuing equity reveals their information to the market, and the value of their share will fall when equity issues are announced. When positive NPV projects (good news) are financed with equity issues (bad news) the signal is mixed, and unless one can separate them, the market will not
vanish. The firm can reduce this problem by resorting to financing that is not subject to information asymmetry (i.e. internal funds, secured debt, unsecured debt, convertible debt and equity issues in the order of preference). This leads to the pecking order theory of Myers (1984) for capital structure.

If equity issues convey bad news to outsiders and reduces the market value of the firm, then debt issues should have the opposite effect. However, despite this, we find that firms do come up with periodic issues of debt and borrowing. If as according to Modigliani-Miller, debt is riskless, there would be no limit to debt financing, if the value of investment exceeds internal funds. However, this is not so, in a world with transaction costs. When we consider bankruptcy costs, the value of a firm in bankruptcy is reduced by the fact that payments must be made to parties other than bond/debt holders or shareholders. A number of theorists have considered the role of financial distress costs on the firms optimal capital structure. Baxter (1967) was the first to suggest the possibility of an optimal capital structure due to costs like trustee fees, legal fees, and other reorganisation costs associated with bankruptcy which reduce the value of assets available to bondholders. Different treatments were offered for considering bankruptcy costs - Stiglitz (1972), Kraus & Litzenberger (1973), Kim (1978), Lee and Barker (1977), Haugen and Senbet (1978).
VITS is the additional value which the levered firm has due to usage of debt caused by the tax deductibility of interest payments for tax purposes.

VEBC is the loss in value which a debt using firm suffers due to increase in bankruptcy risk and the attendant cost of bankruptcy i.e it reflects the Expected Bankruptcy Costs.

The value of the levered firm (V_{jL}) vis-a-vis that of an unlevered firm (V_{jU}) is given by

\[ V_{jL} = V_{jU} + VITS - VEBC \]

Figure 1.7 interprets this model. VITS increase with use of leverage, while VEBC also increases with leverage but at a slower rate. While V_{jU} (value of unlevered firm) is constant, (V_{jL}) the value of the levered firm initially increases with use of leverage and beyond a point , due to high bankruptcy costs (high bankruptcy risk associated with large debt), the value starts declining. The optimal capital structure is that at which the value of the levered firm is maximised \( (D^*) \). At this point the marginal benefit due to debt usage equals the marginal cost of debt (bankruptcy).

i.e. \( d \) VITS/ \( dD \) = \( d \) VEBC/ \( dD \)
The fundamental model is given by
\[ v_j^L = v_j^U + \text{VITS} - \text{VEBC} \] \hspace{1cm} (21)

Figure (1.7)

Given the firm's probability distribution of cash flows, the increased use of leverage, other things being equal, will increase the probability of bankruptcy. The optimal financial structure, then, will result, where the firm's value is maximised

\[ \frac{dV}{dD} = \frac{d\text{VITS}}{dD} - d\text{VEBC}'dD = 0 \] \hspace{1cm} (22)
\[ \frac{d\text{VITS}}{dD} = \frac{d\text{VEBC}}{dD} \] \hspace{1cm} (23)

The marginal benefit of debt = the marginal cost of debt

The analysis thus reduces to a trade-off between the rising expected cost of financial distress and the increasing benefits accruing from the use of financial leverage.
1.2.4 CONCLUSION

Starting with Modigliani-Miller Theory of capital structure irrelevance to financing and investment decisions, there has been a burgeoning literature on the subject. While Modigliani-Miller theory totally contradicts the traditional theory of optimal capital structure, Miller (1977) proved that even in the presence of corporate taxes, under certain conditions, the tax advantage of debt financing at the firm level is exactly offset by the tax disadvantage of debt at the firm level. Theorists like DeAngelo & Masulis (1980), Kim (1978), Kraus and Litzenberger (1976), Jenson & Meckling (1976), attempt to reconcile the Miller model with the balancing theory of optimal capital structure. The general result of their work is that if there are significant "leverage related" costs such as bankruptcy costs, agency costs of debt, loss of non-debt tax shields, and if the income from equity is untaxed, the marginal bondholder tax rate will be less than the corporate tax rate and there will be a positive net tax advantage to debt financing. The firm's optimal capital structure will involve the trade off between the tax advantage of debt and various leverage related costs. As the subsequent chapter reveals, there is much published evidence that the theories have empirical validity.

Myers (1984) in the lines of Donaldson (1961) however appears to describe the corporate practice, by resorting to a "Pecking Order" framework, according to which established firms normally avoid new equity issues and borrowing tends to be determined as the residual between desired investment and
a relative inelastic supply of retained earnings. But this theory again suffers from lack of compelling rational theoretical justification apart from the problems associated with asymmetric information, signaling, tax advantage of debt and transaction costs.

Thus the theories while supporting the belief of leverage related costs and the attendant tax advantages of debt only suggest the possibility of optimising the net benefits of debt which would in turn be reflected in firm value in the market place. However empirical evidences indicate that several institutional characteristics play a dominant part in debt financing decisions of firms. Further, the theories, uniformly resort to firm valuation in the market place, which is a function of various other parameters apart from leverage and which is exogenous to their decisions. As mentioned later, market value has performed well more as a timing variable for debt equity decision and the only values that the firm can control and has access to are "book values", and corporate financing decisions should make note of this fact.

Further the theories are proposed on a static framework. While signaling and asymmetric information lend credibility to the pecking order framework, they still do not explain for the variation in debt ratios across firms and industries and the presence of zero debt companies and the still more basic question of why firms issue debt.
1.3 EMPIRICAL EVIDENCE OF CORPORATE DEBT PRACTICES

A number of studies have attempted to explain the financing decisions of individual firms. Some of the studies have employed the variables as determined by the theories, while others have introduced some more variables considered traditionally as having an influence on financing decisions. The studies can be classified to two types.

(a) Cross sectional studies - studying the influence of some fundamental variables based on theories or considered as having a bearing on debt-equity choice.

(b) Event studies - studying the influence of financing decisions on firm value.

As the thesis is concerned with the determinants of capital structure design rather that their impact on firm value, the cross sectional studies will alone be covered in this chapter.

1.3.1 INDUSTRY INFLUENCE

Schwartz & Aronson (1967) followed by Scott (1972) were the first to investigate the usefulness of industry classification as a predictor of financial structure. While they found a significant link between industry class and financial structure, the explanatory power was only 50%. Further pairwise comparisons of industry financial ratios frequently have yielded insignificant differences, i.e. only some industry financial ratios differ. Martin et all (1979), Friend & Hasbrouck (1986) found that industry classification serves actually as a proxy for a number of fundamental factors related to the firm's size, earnings volatility,
in lower leverage ratios. On the other hand, a high growth associated with a large-sized corporation results in moderate leverage ratios.

Hurdle (1974) tested the influence of market share, growth in sales, profitability, firm size, earnings volatility and asset turnover. While she hypothesized a positive relationship between market power and debt ratios, she found a negative relationship, while growth, profitability, size and volatility had a significant positive, negative, positive and negative relationship respectively on the debt ratios (defined by Total Debt/Total assets. Sullivan (1974) also found a negative relationship between barrier to entry and industry concentration, on debt ratios defined as total debt/total Invested Capital.

Baxter and Cragg (1967) looked directly at debt equity choice. They analysed 230 security issues made in 1950-65 by American companies using Logit and Probit Analysis. Martin & Scott (1974) used Multiple Discriminant Analysis to examine 112 issues made in 1971. Taub (1971) used Logit Analysis to examine 172 issues made in 1960-69. All three studies indicate that companies which are small, which have high price earnings ratios and which have high gearing are most likely to issue equity. Coverage ratios and risk had no significant impact on debt/equity decisions. Baxter & Cragg found companies raising large amount of funds to favour debt and those with high market capitalisation to total assets favouring equity. This could reflect timing consideration or the difficulties of funding future growth
opportunities with long term debt (Myers 1977). Martin & Scott found high payout, low profitability and high proportion of fixed assets to indicate debt issues. The profit variable could have been proxying for timing effect as profitable firms tend to influence market price, while high payout could indicate low risk.

A number of cross-sectional studies provide direct evidence on the determinants of the debt ratio. Chudson (1945), Bray (1967), Lev (1969), Scott (1974), Carleton & Silberman (1977), Ferri & Jones (1979) found that higher operating risk companies tend to carry lower debt in their capital structures. British studies by Brealey, Hodges and Capron (1976) and Briscoe & Hawke (1976), German studies by Schmidt (1974) and two international studies by Stonehill et al (1974) and Toy et al (1979) also support the theoretical view that company size and asset composition influence debt ratios. Chudson found that companies with high proportion of fixed assets tended to use more long term debt, while Bray, Schmidt and Ferri & Jones all found negative correlation between total debt and the proportion of fixed assets. International study by Stonehill et al evidences that executives ranked liquidity of assets highly as a debt ratio determinant. Brealey, Hodges & Capron found larger UK Corporations having more long term debt. This contrasts the finding of Gordon (1962) but confirms the finding of Gupta (1969), Chudson (1945), Bray (1967), Toy et al (1979), Ferri & Jones (1979) and Schmidt (1974). This
presumably reflects that access to capital markets, flotation costs and asset composition are influenced by company size.

Studies by Bray (1967), Gordon (1962) Toy et al (1979) Schmidt (1974) Carleton and Silberman (1977) found debt ratios negatively related to profitability, as they lead to higher retained earnings and lower book value of the ratios, or equity issues could follow abnormal performance. As growth was found to have a positive correlation (Bray, Gupta, Toy et al) it could also mean that high growth companies experience need for higher current assets than fixed assets and hence prefer to finance from short term funds and not resort to capital market. Many other studies by Schwarz & Aronson (1967) Lev (1969) Scott (1972) Ferri & Jones (1979) have found significant industry effects on debt ratios.

Apart from Toy et al (1979) tax has not been found to be an important decision variable, as the tax advantage will be common across all companies at a particular point in time. Toy et al in their interview with executives, however, found tax to be an important debt ratio determinant.

Titman & Wessels (1984) using linear structural modeling observed the following results.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation</th>
<th>Proxy used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uniqueness</td>
<td>negative</td>
<td>quit rates/ R&amp;D Expenditure</td>
</tr>
<tr>
<td>Firm Size</td>
<td>negative</td>
<td>Sales</td>
</tr>
<tr>
<td>Profitability</td>
<td>negative</td>
<td>operating profit/ Invested Capital</td>
</tr>
</tbody>
</table>
They found no significant impact of non-debt tax shields, volatility in earnings, collateral value or future growth on debt ratios, perhaps because the indicators employed did not correctly capture the attributes. The result supports Myers (1984) Pecking Order Theory and Titman's (1984) idea that firms with unique assets carry less debt owing to agency costs. Baskin (1989), empirically investigated the Pecking Order Theory of Myers (1984) and concluded that debt leverage varies positively with past growth and inversely with past profits. High dividend pay outs lead to higher future borrowings. Chaplinsky (1983) used analysis of variance (ANOVA) to examine debt ratio determinants and found significant industry effect for the entire sample. She found a positive relation between leverage and volatility.

Bradley, Jarrell & Kim (1988) regressed leverage against earnings volatility, non debt tax shields (depreciation plus investment tax credits) and advertising and research expenses (non collateralizable assets). The first and third valuables were significantly negative while the second was significantly positive. Long & Malitz (1985) also found similar relationship between leverage and non-debt tax shields.

In their study of influence of financing constraints on investment, Fazzari, Hubbard and Peterson (1988) found that large firms with easier access to capital markets are more likely to issue equity often than small firms. This is because the larger firms face more agency
problems and equity markets could provide the marginal source of external finance for them.

So far the empirical literature on capital structure were reviewed. The empirical studies, other than that of Modigliani-Miller (1958) and Weston (1959) have not attempted to replicate the attempts to prove the validity of the MM Model. Research has been focussed on not whether leverage influences market value (MM) or cost of capital, but have focussed on how firms take debt equity decisions. The resulting evidence have been conflicting. Multiple factors have been introduced and complicated models have been employed. The complexity and subtlety of the models involving concepts such as asymmetric information and signaling or agency compound the problem of empirical testing.

The studies reviewed so far were performed with data of other countries mostly American, British and other European countries. The studies are significant only to the extent that they introduce competing theories and attributes which are considered as having a dominant influence on firms' capital structure decisions. But the very fact that a firm's choice of the type of financing itself depends on the state of development of the loan, bond and equity markets of the respective countries, indicate that studies performed in different countries are bound to produce different results. Hence the studies performed in the Indian context have to be reviewed for a better understanding of the validity of the existing capital structure theories in India.
Sarma and Rao (1968) were the first to attempt to find the validity of the Modigliani-Miller propositions. Using 2 stage least squares technique, they estimated (with data of 30 Indian engineering firms for three years) the relationship between leverage and cost of capital and found that the explanatory variable has a coefficient larger than the tax rate, concluding that debt has an advantage (over and above the tax consideration), thus concurring with the traditional view.

Krishnamurthy and Sastry (1975) examined the economic motivations that underline investment and financing decisions of the Indian Private Corporate sector for the decade 1960-1970, using regression analysis. They suggested that financial factors seem to carry more weight in entrepreneurial investment decisions. Decisions relating to investment, dividends and finance are independent and profitability is a crucial factor in such decisions. The study also throws light on the structure of corporate decisions relating to investment and growth.

Chakraborty (1977) investigated debt equity ratio in the private sector in India. He calculated the cost of capital for 22 firms under consumer, intermediate and capital goods class and found that it was lowest for consumer goods and highest for intermediate goods, due perhaps to the lower debt usage by the former firms. He also found that for all the 22 firms, cost of capital did not change significantly with leverage in consonance with Modigliani-Miller
proposition. Using a questionnaire survey, he identified factors that are considered by companies to influence decisions and tested the relationship empirically. He found that age, retained earnings and profitability to be negatively correlated with leverage, while total assets and capital intensity were positively correlated. He also attempted to derive industry specific multiple regression equations for the debt/equity ratio using RBI data. Using RBI & IIMC sample he also found business risk to be negative correlated with debt equity ratios of firms. He found that contrary to expectation, his analysis did not provide any support to the hypothesis that inflation, measured by price indices, has had a causal effect on the debt/equity ratio in Indian industry.

Bhat (1980) in his paper, concerning the impact of size, growth, business risk, dividend policy, profitability, debt service capacity and the degree of operating leverage, on debt equity ratios for 57 firms, using multiple regression analysis, found, business risk, profitability, dividend payout or debt service capacity to be significant determinant of corporate leverage. The results of his study may be summarised as follows: (a) firm's leverage is not related to size (b) the negative correlation between leverage and risk, shows that risky firms are more likely to employ less debt in their capital structure (c) growth has no influence on leverage (d) dividend payout and leverage are negatively correlated though the causal relationship is not clear (e)
profitability has a strong negative relationship with leverage (f) operating leverage has no influence on the use of debt (g) financial leverage and interest coverage ratio is negatively related to leverage. More than 61% of the total variation in financial leverage is explained by institutional factors (the variables discussed above).

Pandey (1981) established an empirical relationship between financial leverage and the cost of capital. The study was the first of its kind with Indian data. Multiple regressions for 3 years (1968, 1969 and 1970) as well as for the pooled data, were run with cost of capital as the dependent variable and leverage, size, growth, dividend payout, liquidity and earnings variability as independent variables. The study also used two types of leverage, one using preference equity in the debt portion and the other using preference equity as part of equity. He used data of 4 industries viz., Cotton (47), Chemicals (32), Engineering (32) and Electricity generation (20). Because of the substitutability of short term loans for long-term loans in India, debt included both short-term and long-term debt. The average cost of capital was found to decrease with leverage, when the other variables were held constant, consistent with the traditional position. Modigliani-Miller's (1963) article, which corrected their earlier proposition for tax, stated that leverage does not affect cost of capital even if corrected for deductibility of interest charges for tax purposes. Pandey's study showed that even with a modified model, the coefficients of leverage variables were
significant and negative in sign. A third regression model was used for determining the empirical relationship between cost of equity and leverage. Pandey in his study explored the possibility of the cost of equity declining with leverage up to a certain level, as he contented that leverage could accelerate growth in earnings and if growth in earnings is higher than the risk, then cost of equity could decline with leverage. This hypothesis could be established only in the case of electricity industry. In case of other industries, the cost of equity remained constant up to a level of leverage change. Thus his findings, in general were in conformity with the traditional view.

Pandey's (1984) further study on practicing manager's view on corporate borrowing, revealed that corporate managers generally prefer borrowings over other means of financing, subject to internal and external constraints. This was due to the attendant tax advantage of debt and the issue costs and complicated procedures for raising equity. In the light of such attitude, Pandey (1985) conducted a further study to examine the industrial pattern, trend and volatilities of leverage, and the impact of size, profitability and growth on leverage. He used data of 743 companies in 18 industrial groups for the period 1973-1981. About 72 to 80 percent of the assets of these companies were found to be financed by external debt (including current liabilities). Companies employed trade credit as much as borrowing. There was no consistent pattern of leverage even
for companies of the same industry group. But large companies tended to concentrate in high levels of leverage, that it was difficult to say conclusively that size has an impact on the degree of leverage, since a large number of small firms were also found to employ high leverage. While the levels of leverage in the industries in moving upwards, the large majority of companies financing/leverage decisions seem to be independent of their size, profitability, growth and industrial variations, although overtime, profitability, and growth have improved. Majority of the profitability and growth group companies are found concentrated within narrow bands of leverage.

Venkatesan (1983) attempted to explore the relationships of certain defined exogenous variables empirically, to financial leverage. Data used covered companies in the following industry groups: Metal mining (13), Paper and Allied Products (16), Chemicals and Allied Products (14), Blast Furnace and Steel Works (23) and covered the time period 1977 to 1980. The independent variables used were industry categorisation, operating leverage, debt coverage, cash flow coverage, business risk and growth, while leverage, the dependent variable used was total debt to total assets at book value. Except for the chemical industry, there was no clear general influence of industry class on financial leverage. In the case of the former, the leverage levels were found to be clustered around a narrow band. Multiple regressions were run for the cross sections in each industry group. The null hypothesis that size does not have any
relationship with leverage could not be rejected for any of the industries perhaps because due to being the expansionary period for all the industries, firms could have had easier access to debt capital. Even in the case of marginal firms, operating leverage was not found to be significantly related in mining, paper or steel and in the case of chemicals it was highly significant at 0.05% level.

Debt coverage ratios (cashflow coverage) revealed significant relationships in all industries, with financial structure at 0.5% level and was negatively correlated. So was the cashflow coverage ratios which were found to have a higher significance than debt coverage perhaps as it captured the attributes better than the traditional coverage based on earnings. Interestingly business risk had not significant relationship to any of the industries studied, but was negative in case of paper and positive in case of mining and chemical, lending support to a possible explanation of coverage being more dominant than risk in the case of the industries. Growth again did not significantly affect leverage except steel where it was positively related. The pooled regression for all industry groups indicated the following for firms in low leverage groups (less than 40% debt):

(a) firms with high operating leverage tend to rely less on debt and vice versa

(b) debt service coverage has an inverse relationship with debt ratio

(c) firms with higher risk use less debt.
In case of medium leverage (40% - 60%) and high (above 60%) no conclusive relationships emerged, perhaps because of the small number of firms in the sample (20 & 31). Cash flow was however found to be a significant variable at 0.52 level in the case of the medium leverage group. The study thus leads to the conclusion that cash flow coverage is a significant factor in debt financing decisions.

In all the studies, the influence of technology and financial institutions on the capital structure, the desire of management to retain control, the bankruptcy costs attendant with debt, have not been included, due to the non availability of a proper data and measures. Srivastava and Oza (1980) have conducted a study to analyze the financial institutions experience with respect to (a) stipulation of convertibility options and (b) decision criteria used for the exercise of options and related problems and suggest alternative criteria which can incorporate risk and uncertainty involved in decisions to convert in case of profitable and loss incurring companies at the time of decision making. The study revealed that the financial institutions do not gain from conversion on an average. This is because, conversion is mainly opted only in case of loss making companies who have defaulted in payment of loans (profitable companies repay the loans promptly) and it is only the loans of such companies that are converted into equity. The question, however is whether, the inclusion of such clauses in loan agreements, in the case of large (mature) companies and the inherent fear of exercise of the
option by the financial institutions has caused any significant changes in capital structuring of large corporations.

From the summarised empirical findings presented in Table 1.1, it can be observed that growth, size and dividend payout have the opposite relationship with leverage, though that of the first two factors is not significant in all studies, while large and small firms appear to cluster around a narrow band of leverage. Growth could not perhaps be explained as the variable used (usually annual compounded growth in assets or sales) did not correctly capture the relationship.

1.5 CONCLUSION

The contradicting findings of the researches when compared to theoretical hypotheses, on the determinants of capital structure choice leads to the conclusion that there are other factors at play and perhaps an even more dominant influence of financial/regulatory framework is at work. The need therefore arises to analyze the influence of the fundamental determinants of a firms capital structure choice, in the light of the environment in which the firms are functioning. The theories that have developed in advanced economies have been propounded in the background of the also advanced state of the capital markets where both firms and lenders (individuals) have free access to funds. In developing economies, one must be sensitive to the fact that institutional factors play a crucial role in firm financing
decisions and any analysis should take note of the numerous constraints that the corporate sector has to contend with.

There is thus scope for further research therefore as to why corporate managers prefer certain types of finance, in contrast to theoretical predictions and how far availability of funds from external sources, the financial status of the company, existence of competing securities in the market, their own risk attitude, the desire to retain control, their financial objectives, the level of investment and the financial needs due to liquidity constraints influence the choice of capital structure mix, in the context of the regulatory framework, the state of the capital markets and the performance of the companies own shares in the secondary market. These factors outlined above have not been a topic of research in the studies on indian companies.

The scope of the analysis in the succeeding chapter is to empirically build a simple model using multiple regression technique introducing additional firm level attributes and other exogenous factors which could influence the financing decisions of firms. The chapter following, with the help of a questionnaire technique, analyses the qualitative reasons for the financing behaviour, covering those factors that cannot be quantified and measured for use in a mathematical model. It is felt that a combined study of this nature which is supported by practicing managers rational for using different forms of financing is likely to explain corporate financing behaviour under the present environment more accurately.
**TABLE 1.1**

**Fundamental Factors influencing Capital Structure Design in India**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Hypothesized sign</th>
<th>Observed sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth^{2}</td>
<td>+</td>
<td>- Not significant</td>
</tr>
<tr>
<td>Profitability^{3}</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Size^{4}</td>
<td>+</td>
<td>- Not significant</td>
</tr>
<tr>
<td>Business Risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Earnings volatility)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Operating leverage</td>
<td>+</td>
<td>+ Not significant</td>
</tr>
<tr>
<td>Debt service coverage</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cash flow coverage</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Capital intensity</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Asset composition</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(Fixed assets)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retained earnings</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dividend payout</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

1 Dependent variable used here is debt/net worth, though a number of measures have been used.

2 Growth is measured using total assets

3 Gross profit before interest and depreciation scaled by total assets

4 Size is taken as natural logarithm of either total assets or net sales.
Notes

1. Eugene F. Fama & Merton H. Miller "The Theory of Finance"
2. Atomistic competition is one where the activities of individual investors in the capital market have no effect on the prices of securities issued by other investors and firms.
5. Myers argues that Managers have more information on the firm's investment and feel that the firms' shares are undervalued at the market (as the latter does not have their special information) and will refuse to issue shares when the share is undervalued.
Jensen (1986), in his Free Cash Flow theory of takeovers predicts that value increasing takeovers occur in response to breakdown of internal controls informs with substantial free cash flows (in excess of that required to fund projects that have positive net present values when discounted at the relevant cost of capital). The theory explains the benefits of debt in reducing agency costs of free cash flows, how debt can substitute for dividends, why diversification programs are more likely to generate losses than takeovers/ expansion in the same line of activity and why bidders and some targets tend to perform abnormally well before takeover. Free cashflow theory predicts which merger or takeover is likely to destroy rather than create value, and how managers of firms with unused borrowing power and large free cash flows are likely to undertake non-beneficial mergers.

Fischer, Heinekel and Zechner (1989) in their paper develop a dynamic capital structure choice model in the presence of recapitalisation costs. The theory provides the optimal dynamic recapitalization policy as a function of firm-specific characteristics. Even small recapitalization costs were found to swing the firm's debt equity ratio over time. Rather than static leverage measure, the authors use debt ratio range of a firm as an empirical measure of capital structure relevance. The empirical results of their study
strongly supports theoretical model of relevant capital structure in a dynamic setting.

Dammon and Senbet (1988), analyze the effect of corporate and personal taxes on the firm's optimal investment and financing decisions under uncertainty. The paper extends the DeAngelo and Masulis capital structure model by endogenizing the firm's investment decision. They show that investment related tax shields due to changes in corporate tax codes need not be associated with reductions in leverage at the firm level. In cross-sectional analysis, firms with higher investment related tax shields need not have debt-related tax shields (normalised by earnings), unless all firms use the same production technology. Thus cross sectional relationships between investment related tax shields and financial leverage may be misspecified if they do not adequately control for differences in production technologies across firms.

Pilotte (1990), studied the effect of the Economic Recovery Tax Act of 1981 on leverages of firms, in U.S.A., an event which accelerated depreciation write-offs for most firms. Pilotte examined the impact of the act on the change in leverage of firms, by studying the changes during the periods before and after introduction of the Act. Predicting that according to DeAngelo and Masulis, other factors held constant, a firm which experiences a reduction in non debt tax shields will increase its usage of debt financing, Pilotte finds his regression results consistent with the hypothesis. Pilotte also examined the validity of the Pecking Order Theory of Myers, using cross sectional data of the
firms’ external funding requirement (based on the excess of capital expansion over internal funds available) and the internal funds using cash flow generation of firms. Since stock market dictates timing of share/bond issues, Pilotte used a stock price measure to predict preference of equity over debt for financing investment. Pilotte’s results were in conformity with the predictions of Myers’ Pecking Order Theory and firms preferred debt to equity during falling stock prices and vice-versa and passage of the Tax Recovery Act resulted in usage of less tax shield benefits by firms. The study showed that there was negative relationship between change in leverage and the ability of firms to generate internal funds, and there was preference for debt over equity when external funding was required and there was negative relationship between change in leverage and the level of firms’ stock prices.