CHAPTER III: REVIEW OF LITERATURE

This chapter reviews relevant concepts and theories along with respective empirical research and testable propositions (that state the relationship between dependent variable namely, debt maturity structure and explanatory variable).

For the greater clarity, the variables are classified into four categories. Accordingly this chapter is split into four sections as follows.

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Chapter 31: Traditional Attributes of Firms

This section begins with describing briefly how debt maturity theory evolved from capital structure theories and then gives an extensive overview of various theories of debt maturity structure followed by empirical research. In order to provide a general introduction to the topic of debt maturity structure, a brief summary of the field of corporate finance is presented.

Corporate Finance

Being normative, corporate finance theories provide guidelines to maximize the value of a firm i.e. maximization of shareholder value, through management decisions. Generally, these decisions include investment decisions, financing decisions and finally dividend decisions.

Investment, Dividend and Financing Decisions

The investment decisions are net present value decisions entailing mapping out, measuring and working out indices of project risks, cash flows and the cost of capital. The dividend decisions deal how with the amount and forms in which cash that cannot profitably be put into use by the firm is returned to the owners. The financing decisions, of which capital structure constitute a major branch, are concerned with both the mix of financing sources, such as debt and equity (capital structure), and the maturity structure of financing (debt maturity structure)\(^\text{35}\).

\(^\text{35}\) Globally integrated firms’ mix of financing sources also consists of currency composition i.e. domestic and/or foreign currency/ies, evident from many Indian firms borrowing though Foreign Currency Convertible Bonds (“FCCBs”).
These financing decisions further influence both investment decisions (through changes in cost of capital) and dividend decisions (through its impact on free cash flow). The financing decisions thus include identifying both the optimal capital structure, i.e. optimal mix of financing sources, and the optimal debt maturity structure, i.e. optimal duration of debt. Both capital structuring and debt maturity structuring decisions could potentially influence the value of the firm due to market imperfections.

**Corporate Finance Decisions-Capital Structure and its theories**

The seminal works of Modigliani and Miller (1958, 1963) lays foundation for research on capital structure. Under certain conditions (i.e. perfect markets\(^{36}\)), their models state that a firm's financial structure (defined by dividend policy and choice of leverage) remains irrelevant. The seminal paper of Jensen et al. (1976) on the theory of the firm and agency problems (due to the separation of ownership and control) advances this field. Using the agency theory and making assumption of information asymmetry, Ross (1977) argues that leveraging decisions taken together with self interests of managers acts as signals to investors thereby leading to higher valuations of leveraged firms.

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\(^{36}\)The critical properties of perfect markets are (i) No taxes; (ii) No transaction or distress costs; (iii) common objectives among all decision makers; and (iv) perfect information available.
The main theories of capital structure are: (i) Trade-off Theory; (ii) Pecking order Theory; and (iii) Agency Cost Theory. The capital structure theories are too well-known to be discussed here. Also it is outside the scope of this study.

**Theories of Debt Maturity**

Furthering Ross (1977)’s signaling idea, Myers (1977) develops a theory on corporate borrowing behavior, thus providing one of the first benchmark papers on debt maturity structure. These theories were first developed during 1980s (Barnea et al., 1980; Brick and Ravid, 1985; Flannery, 1986; 1991) and early 1990s (Lewis, 1990; Diamond, 1991).

As the theoretical literature comprises numerous autonomous propositions (relationship between the explanatory variables and the debt maturity structure), there is no integrated approach to these theories. Therefore, the study adopts the groupings followed by Stohs and Mauer (1996), Yi (2005) and Antoniou et al. (2006). Accordingly, the theoretical models to achieve optimal debt maturity structure are grouped into four: (i) Tax-based explanation; (ii) Risk management; (iii) Asymmetric information/signaling model; and (iv) Agency (contracting) costs.

**Tax**

The market imperfections give rise to taxation and subsequent deductibility of interest expenses. The arguments that deal with taxation are referred to as the “tax” argument.

**Risk Management**

The second strand of arguments relates to the risk management. The maturity structure of debt exposes firms to exchange and interest rate risks leading to the risk
of inefficient liquidation. It argues that a trade-off exists between these risks and the costs of both raising and servicing debt. These arguments in this category are referred to as “risk management” arguments.

**Signaling**

These arguments run parallel to the pecking order theory of capital structure. Signaling theory argues that maturities of debt issued by firms provide signals to outside investors who draw inferences on firm quality and the potential of positive or negative private information. These arguments are referred to as “signaling” arguments.

**Agency (Contracting) Cost**

The fourth and final strand is related to agency problems that are arise from the conflicting interests of managers, owners and creditors. According to the theory, the maturity structure of debt affects these conflicts. Subsequently, these arguments are referred to as “agency (contracting) cost” arguments.

The following paras discuss the main theoretical models under each of these arguments first. The focus of this study is on interest rates and term structure of interest rates (the variables that fall in Tax argument theory). Hence, the same are discussed in detail. Each argument’s theoretical concept is followed by the respective empirical research.

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37 It is also known as contracting as it is based on the contract between parties such as shareholders /owners and managers or managers and creditors, etc.
31.1 The Tax Argument

The existence of market imperfections, such as taxes, gives debt financing an advantage over equity due to the tax deductibility of interest expenses. This in turn influences optimal capital structuring decisions. Relaxing the assumptions of perfect capital markets of their earlier work, Modigliani and Miller (1963) incorporates the effect of taxes on capital structure in their revised model, and models the impact of taxes on optimal capital structure.

**Tax, Interest Rate & its Volatility and Term Structure of Interest Rates**

Assuming riskless bonds, Boyce and Kalotay (1979) demonstrate that if both personal and corporate taxes differ, and if the term structure of interest rates is not flat, then debt maturity will affect the after tax cost of debt. That is, the *total tax* benefit of debt is not independent of the maturity structure of debt. In particular they find that a upward sloping term structure of interest implies that long term debt is optimal. Brick et al (1985) have demonstrated the existence of an optimal debt maturity strategy with bankruptcy costs, but they do not develop general conditions to determine which maturity (short or long) strategy is optimal.

Brick and Ravid (1985) provide a tax-based rationale for debt maturity choice. Because the firms can default on its promised debt payments, the expected value of the firm’s tax liability depends on the maturity structure of its debt whenever the term structure of interest rates is not flat. They assume that the probability of default increases with time, and the value of the firm’s interest tax shield go down upon default\(^{38}\).

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\(^{38}\) According to Barclay and Smith (1995), this occurs, for example, if in reorganization, the firm faces binding constraints on the use of tax carry loss carry backs.
If the yield curve is upward sloping, then interest expenses (from long term debt) in the early years are greater than the expected interest expenses from rolling short term debt. Hence, the interest expenses (from long term debt) are less in later years. So issue of long term debt reduces firm’s expected tax liability and consequently increases the firm’s current market value. Conversely, if the term structure is downward sloping, the issue of short-term debt increases firm value. Therefore, the tax hypothesis implies that firms employ more long-term debt when the term structure has a positive slope i.e. they are positively related.

Noting that Brick and Ravid assume that the firm selects leverage before the debt maturity structure, Lewis (1990) challenges them that taxes will not impact the firm value if optimal leverage and debt maturity structure are determined simultaneously.

In a subsequent paper, Brick and Ravid (1991) extends the tax-induced argument of their paper (1985) to allow for the presence of stochastic interest rates, and demonstrate that the preference for long-term debt may be applied to flat, or even downward sloping yield curve when interest rate is uncertain. In other words, a debt capacity factor creates an additional incentive to issue long-term debt under uncertainty.

**Empirical Research**

Boot and Frankfurter (1972), Kane et al. (1984), Mauer and Lewellen (1987), Barclay and Smith (1995), Kim et al. (1995), Guedes and Opler (1996), Stohs and Mauer (1996) examine the relationship between tax and debt maturity structure. None of them have found the same significant.

39 Random
Scholes et al. (1992) propose the *tax clientele* argument to predict the relationship between debt maturity and taxes. It is argued that not all firms can afford to issue (luxury) long-term debt although transaction costs stemming from rolling-over short-term debt become higher. The authors contend that corporations having high marginal tax rates construct a natural clientele of cheap long-term debt (long-term debt yields higher tax shield). They, then, expect a positive relation between debt maturity and marginal tax rates\(^{40}\) as firms can use the ongoing tax advantages of long-term debt. In the Indian context, Majumdar R (2010) finds that contrary to the hypothesis, debt maturity and effective tax rate are positive and statistically insignificantly related.

**31.2 The Risk Management Argument**

The risk management argument hinges on the ideas of immunization\(^{41}\). A hedging strategy is intended to reduce or eliminate interest rate risks by matching assets and debt maturities, and liquidation risk (i.e. the risk of inefficient liquidity). Both these ideas underscore the principle of maturity matching which implies that the debt maturity structure of a firm is determined by its asset structure.

*Asset Structure*

Morris (1976) explores risks associated with various debt maturity structures. The model presented by Morris analyses the effect of bond maturity (short vs. long) and how this affects the variance of net income, which in turn affects a firm’s cost of

\(^{40}\) Harwood and Manzon (1998) show that the firms with high marginal tax rate use more long-term debt than the firms with low marginal tax rate.

\(^{41}\) Making a firm immune to risk
equity. Morris assumes that firms face two types of maturity policies to decide upon, long term versus short term. A long term policy involves maturity matching, where the maturity of assets are matched to the maturity of debt. A key advantage of matching these maturities is increased predictability in terms of cost of financing assets. Furthermore, by holding debt with shorter maturities than the maturities of assets, the firm runs the risk of not being able to meet its commitments, as the assets have not yet generated sufficient cash flows to service the debt. In the opposite case, the firm runs the risk of having no assets that can generate the cash flows necessary to service the debt, as the assets are retired prior to the debt maturing.

Nevertheless, the increased predictability may in fact be sub-optimal for equity holders, implying that breaking the maturity matching principle can be beneficial under certain circumstances. Morris argues that the covariance between net operating income and future interest rates determines when breaking (by financing long term assets with short term debt rolled over) the matching principle is beneficial to equity holders. According to Morris, whenever this covariance is positive the uncertainty regarding future interest costs are countered by a lower volatility in net income. This results in net income and subsequently cost of equity being less variable thereby increases the value of the firm. The reduction in net income will consequently not be as severe when financing with short term debt as opposed to long term debt. Long term debt involves fixed interest payments and therefore a drop in interest costs will not counter a drop in net operating income. In effect, net income becomes more volatile with a long term borrowing policy. However, this result only holds when the covariance is positive. Following a short term borrowing policy when
the covariance between net operating income and interest rates are zero or negative will effectively increase the volatility in net income compared to a long term policy.

Stulz (1996) explores the area of corporate risk management and focuses on the divergence observed between theory and current practice. Academic theory claims that firms can increase their market value through implementing systematic minimum variance hedging schemes that eliminate exposures toward e.g. interest and exchange rates. In practice however, it is observed that firms tend to conduct more of a selective hedging strategy. Besides hedging against various known exposures, such as those mentioned above, firms also use corporate risk management to exploit information asymmetries in situations where managers are convinced that they hold private information that enables them to predict future price movements better than the market in total.

To bridge this gap, Stulz presents a modified goal for corporate risk management, which merges academic theory with that observed in practice, stating that firms should only hedge against costly downside outcomes. Stulz therefore regards this modified goal of risk management as corresponding to purchasing an out of the money put option that limits downside risk while leaving potential upside outcomes unhedged. However, the extent to which firms can benefit from these unhedged upper tail outcomes depend on their financial strength and their ability to withstand situations where the potential upper tail outcomes manifest as negative lower tail outcomes without having notable effects on firm value. The intuition underlying this argument refers to the relation between financial strength and the cost of financial distress; unhedged positions introduce greater variability in cash flows, which increases the probability of default and hence the present value of costs of financial distress increases, causing firm value to drop.
Profitability

In addition to reducing the costs of financial distress, Stulz (1996) argues that corporate risk management can contribute to reduce two other costs related to increased variability in cash flows i.e. (i) increased required return of stakeholders; and (ii) increased tax-payments. Firstly, the increase in required return of stakeholders is particularly apparent in closely held firms where owners have large fractions of their wealth tied up in the firm. Corporate risk management efforts that hedge the financial exposure of such stakeholders will reduce their required return by lowering stakeholders ‘risk. In effect, the present value of the firm will increase as a result of lower return constraints. Secondly, predictability of income is crucial in order to lower tax payments. Most countries (including India) have progressive taxation systems, which imply that firms can minimize tax payments across business cycles by maintaining taxable income within optimal ranges. Stulz (1996) concludes that the managers able to utilize corporate risk management measures to reduce the net effect of these three costs will increase the value of their firm.

To summarize, Stulz (1996) provides general implications of corporate risk management and arguments emphasizing its importance. Furthermore, Stulz claims that corporate risk management is a key to ensure the future existence and prosperity of a firm, by reducing the likelihood of financial distress and in parallel maintaining the financial flexibility to undertake replacement and value creating investments.

Earning Volatility

While the implications presented by Stulz (1996) are general in nature and not directly testable, Morris (1976) offers specific predictions on firm characteristics
assumed to be reflected in the debt maturity structure. It is expected that firms with a positive covariance between net operating income and interest rates to exhibit low variability in net income and larger fractions of short term debt, compared to those with a zero or negative covariance. Firms in the latter two situations are thus assumed to exhibit a greater level of maturity matching and consequently an overweight in long term over short term debt. However, Morris's (1976) predictions can also be formulated and tested in an alternative way. Following Morris (1976) it is expected that firms with an overweight of long term debt to try to match the maturities of debt and assets.

**Empirical Research**

*Asset Maturity*

Jun and Jen (2005) find that firms with a high degree of maturity matching are more likely to stabilize their equity values and hence exhibit lower stock return volatility. Hence asset maturity is considered an important determinant of debt maturity. Majumdar (2010) finds it is negative and insignificant for the Indian firms.

**31.3 The Signaling /Asymmetric Information Argument**

The signaling argument arises due to the existence of private information, or information asymmetries, between firm insiders and firm outsiders.

*Firm Quality*

Building on the logic underlying the pecking-order theory, it is argued that outsiders perceive the issuance of debt as signals revealing information on the quality of firms. Given that the debt maturity structure serves as an indicator on the quality of a firm (credit worthiness and the existence of positive private information), managers will
take this factor into account when issuing debt. The preceding argument can, therefore, be considered as the analogous to the Pecking Order Theory of capital structure decisions.

**Various Signaling models**

Signaling models can be categorized as strict signaling, liquidity risk, and debt seniority model. The research related to liquidity risk and debt seniority does not necessarily adhere to the strict definition of a signaling model, these topics can be grouped similarly because corporate managers seek to convey this asymmetric information to uninformed investors through maturity structure choices.

**Strict signaling model**

Classified by traditional signaling model, strict signaling model can be classified into separating equilibrium and pooling equilibrium model. In separating equilibrium model, investors reason private information held by borrowers, which means that the firm’s choice of debt maturity reveals its type. Whereas, in pooling equilibrium models that may be called adverse selection model, private information is not revealed and maturity is chosen to minimize the effect of private information on financing costs.

**Liquidity**

Myers and Rajan (1998) introduce a paradox theory of liquid assets. Intuitively, highly liquid firms should have ample cash flows to repay their debt. Thus, a firm with a large amount of liquid assets should easily obtain external financing. However, the authors also emphasize the importance of illiquid assets used in the core business. They argue that because illiquid assets ‘are there’, this gives creditors more time to
assess their value and risk and consequently the firm with certain amount of illiquid assets may find it much easier to issue long-term debt. On the other hand, Morris (1992) argues that firms with longer maturity hold greater liquidity in case they cannot meet the fixed payments of long-term debt during economic recessions.

**Leverage ratio**

Morris (1992) argues that long-term debt may help firms to postpone the exposure to bankruptcy risk; therefore, high leverage firms tend to use long-term debt. Stohs and Mauer (1996) indicate that a large proportion of long-term debt inevitably produces a higher value for average debt maturity. Leland and Toft (1996) conclude that the leverage level relies on the debt maturity, and firms with lower leverage level tend to be financed by short-term debt. In contrast, Dennis et al. (2000) shows that the leverage is inversely related to debt maturity. They argue that the negative relationship arises because agency costs of underinvestment may be limited by reducing leverage and shortening debt maturity.

Consistent with the hypothesis those firms lengthen their debt maturities to offset the higher probability of a liquidity crisis due to leverage, Stohs and Mauer (1996) find a positive relation between debt maturity and leverage.

**Age**

Scherr and Hulburt (2001) also argue that age of a firm can be employed as a signaling tool. In these terms older firms are said to signal through their age that they are more stable than younger firms. Therefore older firms are expected to have a larger share of long-term debt than younger firms do
**Equity Share Market Price**

As per the signalling hypothesis, undervalued firms issue short-term debt to signal their undervaluation. The expectation is that these firms will have positive abnormal stock returns at the time of issue. Guedes and Opler (1996) state that past stock returns may be used as predictors of debt maturity as it is generally expected that issuing informationally disadvantaged securities (e.g. long-term debt) precedes share price run-up. Hence a positive correlation between debt maturity and share price performance can be expected.

**Empirical Research**

Antonio et al (2006) shows that the association of debt maturity with share price performance is not uniform across countries.

**Equity Risk Premium**

It measures the cost of equity in relation to the return on risk-free investment. When equity premium is high, firms tend to prefer issuing debt rather than equity. Fama and French (1989) suggest that the premium of long-term share in total debt should have an impact on both equity and debt market. It is argued that expected bond returns are generally low when business conditions are good due to, e.g. the availability of profitable growth opportunities. Under such conditions, one may observe high equity returns. Baker and Wurgler (2000) find that firms tend to issue equity instead of debt when the future cost of equity is relatively low.

Fama and French (1989) also report that expected returns on stocks and corporate bonds move together. Consequently, equity risk premium can be expected to have different impact on debt maturity. For instance, it may be possible due to information
asymmetries that firms issue short-term debt when equity premium is high as high equity premium can imply high premium on long term debt.

**Empirical Research**

Antoniou et al. (2006) show that the association between debt maturity and equity premium is country dependent. It is insignificant in France and Germany, and positive and significant in the UK. These estimates imply that debt markets and equity markets are not integrated in France and Germany. On the other hand, the significant and positive association between these variables in the UK suggests that the UK firms issue long-term debt if equity premium is high. As discussed in Baker et al. (2001), this reflects managers’ attempt to minimize the cost of capital and integration of debt and equity markets. This is consistent with Fama and French (1989)’s view that equity and debt markets move together.

**Firm Quality**

The *signalling hypothesis* implies that firms with high asymmetric information problems and high-quality projects choose to issue shorter-term debt (see Mitchell, 1993). Under asymmetric information, Flannery (1986) argues that long-term debt, which is more sensitive to firm value, can potentially be more mis-priced than short-term debt. Hence, high (low) quality firms are more likely to issue less (more) undervalued (overvalued) short (long) –term debt. Datta and Iskandar-Datta (2000) find a negative relation between long-run abnormal returns and the maturity of debt-IPOs, which is predicted by Flannery (1986). Thus, a negative relationship between firm quality and debt maturity is expected.
Leverage

Leland and Toft (1996) theoretically show that if firms choose higher leverage, they also choose longer maturity and Morris (1992) suggest that firms with higher debt ratios tend to issue longer-term debt in order to delay their exposure to bankruptcy risk. On the other hand, the tax and bankruptcy (trade-off) arguments, implying optimal debt policies, predict a negative effect of leverage on debt maturity.

Stohs and Mauer (1996) find a positive relationship between debt maturity and leverage. Kroner’s study of Czech firms finds leverage to be positively related to debt maturity. Majumdar (2010) finds it is significant and positive for the Indian firms.

31.4 Agency/Contracting costs

The following paras consider growth options, size, and collateralizable assets as the major attributes.

Growth Opportunities (Options)

Myers (1977) and Barnea, Haugen and Senbet (1980) model the relation between agency costs and debt maturity. While Myers (1977) centers his models on the A3 (owners and creditors) problem, the models of Barnea et al. (1980) comprise both the A1 (owners and managers) and the A3 (owners and creditors) problems.

Myers (1977) states that agency costs relating to the issuance of debt can be resolved by shortening the debt maturity. Firms can issue shorter term debt which matures before investment for new growth opportunities is required and hence it can be re-contracted—before the growth option is exercised.

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42 Effect of leverage on debt maturity varies across different theoretical prediction. For instance, liquidity risk hypothesis predicts that firms use more long term debt to avoid exposure to bankruptcy, the agency cost and tax arguments predict an opposite relation.
Similarly, Barnea et al. (1980), also focus on resolving agency problems arising from information asymmetry, risk incentives and underinvestment. However, as opposed to Myers (1977), Barnea et al. (1980) argues that these problems can be resolved by issuing call provisions on corporate debt, as opposed to issuing debt with shorter maturities. Nevertheless, Barnea et al. (1980) admit that the agency problems they explore can equally be resolved by shortening the debt maturity. Corporate debt with call provisions and short term debt consequently represent substitutes as solutions to costs associated with the agency problems explored by Barnea et al. (1980).

While Myers (1977) portrays that there exists an optimal level of promised payments to lenders, Barnea et al. (1980) argues that there exists an optimal expiration date of the call provision. The intuition underlying why firms can eliminate the agency costs through issuing call provisions is as follows; the amount of debt that firms can raise depends upon market expectations toward future performance. Assuming the existence of two projects where one has a greater present value than the other. Firms know that they can invest in the high value project, while the market expects firms to take upon the low value project with greater risk. The amount of debt raised by firms is therefore restricted by market expectations, which in turn affects the value of the firm negatively. Firms can eliminate this cost by issuing call provisions which allows them to repurchase the debt, issued on the back of current market expectations, at future dates. This feature allows firms to benefit from the arrival of new information in the future, which improves the market expectations of the probability that firms are running the high value project. The call provision enables firms to repurchase outstanding debt and reissue new with improved financial terms and thus increasing the amount of debt raised.
Even though Myers (1977) and Barnea et al. (1980) propose different approaches to resolving certain agency problems, the outcome remains the same.

**Firm Size**

Firm size is potentially correlated with debt maturity for several reasons. Issuance costs for public issues have a large fixed component resulting in significant scale economies; they typically opt for private debt with lower fixed costs and frequently lower overall costs\(^{43}\). Small firms that choose bank debt over public debt because of the lower floatation costs will have more short term debt.

**Collateralizable Assets**

The proportion of collateralizable assets (e.g. assets such as premises or inventory that can be mortgaged/pledged in favor of the creditor/s) in the firm’s balance sheet is also believed to have an impact on the debt maturity structure (Whited, 1992). Firms with a higher share of collateralizable assets can pledge these assets in favor of the long-term debt-holders. Holding of these collateralizable assets thus favors these firms in comparison to the firms with fewer collateralizable assets. The firms with fewer collateralizable assets are thus believed to have less long-term debt and more short-term debt. The impact of collateralizable assets is widely accepted, especially in terms of long-term debt discussions. Although short-term financing is to some degree provided on a bianco basis (with no collateral), the bianco approach for long-term debts is very rare and collateral plays a very important role.

**Empirical Research**

**Growth -Investment Opportunities set (Owner and Managers’ Conflict-A1 Type)**

\(^{43}\) Blackwell and Kidwell (1988) find that small, risky firms issue private debt almost exclusively while larger, less risky firms are more likely to issue public debt.
Barclay and Smith Jr. (1995) find empirical support for the inverse relation between growth opportunities and debt maturity structure, predicted by Myers (1977) as a means to reduce the underinvestment problem arising from the conflicting interest between owners and creditors. Barclay and Smith Jr. (1995) also find that regulated firms generally have longer debt maturities, which is regarded as being consistent with the fact that such firms are less prone to the underinvestment problem. However, they do not control for the effect of leverage in their tests.

**Firm Size**

**Large Firms**

Easterwood and Kadapakkam (1994) empirically tests several agency cost hypotheses by removing the confounding effect of leverage. The authors find that debt with shorter maturities is more frequent in situations where the potential of agency costs are higher, especially for larger firms with lower costs of issuing debt.

Stohs and Mauer (1996) carry out broad empirical testing of the determinants of corporate debt maturity structure, including the agency cost, signaling, liquidity risk, maturity matching and tax hypotheses. With regards to the agency cost theory, the authors predict that debt maturity will decrease with decreasing firm size and also with a larger proportion of growth opportunities in the investment opportunity set. Their results provide only limited support for the claim that debt maturity serves as a mechanism to reduce A3 agency conflicts and that small firms tends to hold more short term debt. However, the latter finding provides only limited support for the predictions of Myers (1977), that debt maturity is inversely related to proxies for a firm's growth opportunities.
Ownership- A1 Type (Managers and Shareholders Conflict)

Ang, Cole and Lin (2000) find that external monitoring by banks reduces the agency cost incurred by firms relying mainly on bank debt.

Managerial Ownership

Datta, Iskandar-Datta, and Raman (2005) Benmelech (2006), García-Teruel and Martínez-Solano (2007) and Datta, Iskandar-Datta, and Raman (2005) argue that the conflict between shareholders and managers, A1, over the debt maturity structure is rooted in the inherent preference for less monitoring by self-centered managers. They find that managers with high stock ownership choose shorter debt maturities and thus accept more frequent monitoring. More entrenched managers, holding less equity, choose longer debt maturities. These findings were significant and robust, even after controlling for a number of determinants of debt maturity structure, identified in the literature, and while modeling debt maturity and leverage as endogenous variables.

Similarly, Benmelech (2006) argue that entrenched managers will prefer long term debt financing in order to preserve private benefits of control, even when liquidation is efficient. Benmelech (2006) also provide empirical support for the notion that entrenchment and managerial private benefits are important determinants of debt maturity structure.

García-Teruel and Martínez-Solano (2007) examines the effects of managerial equity holding and the presence of large shareholders on the debt maturity structure of Spanish listed firms. While controlling for known determinants of debt maturity structure they find a non-monotonic or concave relation for both. With regards to the effect of managerial equity holdings, their results correspond to those of Datta,
Iskandar-Datta, and Raman (2005), and Benmelech (2006) despite using a sample originated in a different institutional setting, namely civil law, as opposed to the Anglo-Saxon, or common law, setting often dominating the literature.

**Shareholder Rights-A3 (Shareholders and Creditors) Type**


Adding to the role of influence of the rights of owners and shareholders on debt maturity structure, Jiraporn and Kitsabunnarat (2007) find an inverse relation between the strength of shareholder rights and debt maturity. They contend that weak shareholder rights leads to managers favouring long term debt as this implies less frequent monitoring. Jiraporn and Kitsabunnarat also demonstrate that the use of longer debt maturities is likely to be brought about by weak shareholder rights.

Deesomsak, Paudyal, and Pescetto (2009) argue that when ownership concentration is high, the interest of managers and owners are likely to be more aligned, thus reducing the A1 problem. However, such alignment is argued to increase the A3 problem due to moral hazard and thus increase the cost of debt. Subsequently the moral hazard hypothesis predicts that firms with high ownership concentration will issue more short term debt to mitigate the A3 problem. Shareholder rights and ownership concentration can therefore to some extent be seen as substitutes as both act as mechanisms to ensure that the control of the firm remains within the hands of the owners.
Family Firms

Whereas Schmid et al. (2008) argue that family involvement is an effective governance mechanism resulting in reduced A1 (owners and managers) conflicts, García-Teruel and Martínez-Solano (2007) are unable to find any particular effects when the main shareholder is a family, in their survey of Spanish listed firms.

Empirical Studies-Summary

The empirical studies in the early 1990s focused on firms’ characteristics viz., financial or microeconomic approach to debt maturity structure. The later studies, which are cross country, examine country characteristics such as institutional characteristics, legal and governance, market systems (market based vs. bank based), etc. Over time, the theoretical paradigm has shifted gradually from financial approaches to non-financial approaches, from country-based studies to regional studies, from developed economies to developing economies, and from market economies to transitional economies.

The recent studies have focused on effect of international macro and international finance on the debt maturity structure of the firms. Since international capital flows have attracted attention there is a group of studies that have examined the effect of financial crisis caused by the sudden stopping of international capital flows. The effect have been examined on various such performance of firms, investment, capital structure, debt maturity structure. Within the genre of debt maturity, some researchers have examined the timing of debt issues based on certain macro economic variables such as term structure of interest rates. This section synthesizes and classifies the most significant research literature on debt maturity structure from
the perspectives of how corporate finance, macro economics and international macroeconomics (financial globalization) might influence the debt maturity structure.

In the context of the research question pertaining to the listed Indian companies, empirical research review focuses on three groups of factors namely (i) the traditional attributes of firms; (ii) contemporary attributes of firms; and (iii) macro variables.

**Comprehensive Empirical Research-Traditional Firm Characteristics**

Empirical studies examine various determinants of debt maturity choice of firms. They use various proxies for certain attributes while investigating the relationships. These firm characteristics are financial (debt equity ratio/leverage, liquidity, risk, asymmetric information) and nonfinancial (age, size, ownership-large shareholders or small, sector, listed or unlisted, public or private companies).

Barclay and Smith (1995), Guedes and Opler (1996) and Stohs and Mauer (1996)’s comprehensive studies cover all four arguments.

**Empirical Research- Country and Cross-country Studies**

After the first generation of empirical studies that examine the determinants of debt maturity mainly in the USA, the later studies shifted focus on country studies to test the validity of these theories outside the USA. These include: Schiantarelli and Sembenelli (1997), Demirguic-Kunt and Maksimovic (1999), Ozkan (2000) for the UK, Bancel and Mittoo (2004), Esho, Lam, and Sharpe (2002) for Australia, Fan et al. (2008) , Deesomsak et al. (2009); Antoniou et al.( 2006), Kroner (2007) for Czech firms, Cai et al. (2008) for China, Majumdar (2010) for India. These studies show that corporate financing decisions are determined not only by firm-specific
characteristics, but also by country-specific factors such as economic conditions, corporate governance and institutional environment. Different market conditions can influence firm’s borrowing decisions by affecting the level of long- and short-term debt and by creating incentives for firms to alter the debt maturity-mix. The findings of some of the above are given in the following Table.

Antoniou et al. (2006) examine the determinants of debt maturity choice for firms in Europe -France, Germany and the UK- countries with vastly different financial systems and institutional characteristics.

Demirguic-Kunt and Maksimovic (1999) who investigate capital structure of firms in 30 developing and developed countries during the period 1980-1991 find that the presence of well-developed stock markets is an important determinant of the positive relationship between firm size and debt maturity. They also find that small firms in bank dominated systems tend to use relatively less short term debt.

**Summary**

The major theoretical work is summarized below.
<table>
<thead>
<tr>
<th>Argument</th>
<th>Variable</th>
<th>A Priori Relation</th>
<th>Reference</th>
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</thead>
<tbody>
<tr>
<td>Tax</td>
<td>Term Structure</td>
<td>Positive</td>
<td>(Brick and Ravid 1985)</td>
</tr>
<tr>
<td></td>
<td>Term Premium</td>
<td>Positive</td>
<td>(Brick and Ravid 1985)</td>
</tr>
<tr>
<td>Risk</td>
<td>Asset Structure</td>
<td>Positive</td>
<td>Morris 1976</td>
</tr>
<tr>
<td>management</td>
<td>Earnings volatility</td>
<td>Positive</td>
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<td></td>
<td>Concave</td>
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<td>Flannery 1986</td>
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<td></td>
<td>Negative</td>
<td></td>
<td>Diamond 1991</td>
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<tr>
<td>Agency</td>
<td>Underinvestment</td>
<td>Negative</td>
<td>Myers 1977 and (Barnea, Haugen, and Senbet 1980)</td>
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<tr>
<td>problem</td>
<td>Overinvestment</td>
<td>Negative</td>
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<td></td>
<td>Asset Substitution</td>
<td>Negative</td>
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<td></td>
<td>Probability of Financial Distress</td>
<td>Negative</td>
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</tbody>
</table>

Source: Own Compilation based on the theories
Chapter 32: Contemporary Variables

32.1 Market Power

Market power means control of a firm over price or volume of production, or both. In operational terms, market power implies a firm’s monopolistic, oligopolistic or competitive power.

32.1.1 Tobin’s Q\textsuperscript{44} Ratio


Rathnasamy, Krishnaswamy and Mantripragada (2000) opine that market structure (power) could be measured by the Lerner index\textsuperscript{45}, or the Herfindahl-Hirschman index\textsuperscript{46}, or Tobin’s Q. Lindenberg and Ross (1981) show that Tobin’s Q (or simply

\textsuperscript{44} Named after James Tobin

\textsuperscript{45} Named after the economist Abba Lerner, it describes a firm's market power defined by }L=P-MC/P, \text{ where } P \text{ is the market price set by the firm and } MC \text{ is the firm's marginal cost. The index value is from 1 to a low of 0, with higher numbers implying greater market power. For a perfectly competitive firm (where } P=MC), L=0; \text{ such a firm has no market power.}

\textsuperscript{46} “A commonly accepted measure of market concentration, it is calculated by squaring the market share of each firm competing in the market and then summing
Q) is theoretically a sound and practically the most powerful indicator of a firm’s market power. In a competitive market, all firms will have q equal to one. Firms with Q higher than one are expected to command competitive advantage either oligopoly or monopoly power. In developing/emerging countries like India, price and quantity or segmental data are not available for measuring the Lerner index or the Herfindahl-Hirschman index. The theoretical definition of Q is the ratio of market value of the firm to replacement cost of assets. The data on replacement cost are not readily and publicly available in India. According to Chung and Pruitt (1994), Q could be measured and defined as the sum of market value of equity and book value of long-term debt and net current assets (current assets minus current liabilities). In a competitive market, the Q of all firms will be equal to one. Firms with a Q higher than the resulting numbers. For example, for a market consisting of four firms with shares of thirty, thirty, twenty and twenty percent, the HHI is 2600 (30^2 + 30^2 + 20^2 + 20^2 = 2600). The HHI takes into account the relative size and distribution of the firms in a market and approaches zero when a market consists of a large number of firms of relatively equal size. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. Markets in which the HHI is between 1000 and 1800 points are considered to be moderately concentrated and those in which the HHI is in excess of 1800 points are considered to be concentrated. Transactions that increase the HHI by more than 100 points in concentrated markets presumptively raise antitrust concerns under the Horizontal Merger Guidelines issued by the U.S. Department of Justice and the Federal Trade Commission” http://www.justice.gov/atr/public/testimony/hhi.htm
one are expected to command competitive advantage in the form of either oligopolistic or monopolistic power. Hence, market power is defined here in terms of Q. There is also a practical reason for using this definition of market power. In developing countries like India, price and quantity or segmental data are not available for measuring by way of the Lerner index or the Herfindahl-Hirschman index. All these studies establish a linear relationship, either positive or negative, between capital structure and market structure. Contrary to the linear relationship, Pandey (2004) ’s study of 208 non financial companies on Kualalumpur Stock exchange, Malaysia, between 1994 to 2000 shows a cubic relationship, due to the complex interaction of market conditions, agency problems and bankruptcy costs.

The theoretical definition of Q is the ratio of market value of the firm to replacement cost of assets. It is not easy to get replacement cost data in developing countries. Chung and Pruitt (1994) show that Q could be effectively defined as the sum of the market value of equity and book value of long-term debt and net current assets (current assets minus current liabilities) divided by the book value of equity, long-term debt and net current assets. Like Rathinasamy, Krishnaswamy and Mantripragada (2000), the current study uses this measurement. Since capital structure and Tobin’s Q are related, it is expected that debt maturity structure and Tobin’s q are also related.

Further since capital structure and market power are inversely related (Firms with more market power will have lower leverage), it is expected that firms with higher market power will have more of short term debt. This is evident from balance sheets of companies such as Hindustan Unilever Ltd. As on March 31, 2010, HUL had short term debt and no long term debt.
32.1.2 Market Power Index

For instance, MNCs such as Hindustan Unilever Ltd. (“HUL”), Pfizer Ltd. et al. have market power so that their balance sheets have insignificant debt as part of their total liabilities or have insignificant amount of short term debt. For instance, as on March 31, 2010, HUL’s had no long term borrowings. HUL had short term borrowings that too for working capital requirement. Since FY 2005, Pfizer has no debt. Also companies that have market power are able to obtain trade deposits from their dealers/distributors. Moreover, many companies can get even advances on their revenue account from their customers.

32.2 Uniqueness

Companies that have royalty payment might have contemporary technologies to incorporate into their product/service offerings. Also companies such as Dr Reddy’s Laboratories Ltd. spend larger proportion of their sales on research and development than bulk drug companies. Some companies such as Infosys Ltd.’s good corporate governance and their business model finds reflection in their high proportion of intangible assets in their market capitalization. These firm characteristics have not been investigated for debt maturity structure.

32.3 Global Integration

In the context of firms, globally integrated companies have global linkages in its entire value chain more particularly product and input (financial and money) markets as well as operations.

Globalised companies either export their goods/services or produce the same and sell them in overseas markets or both. Also such companies have access to international financial (capital, bonds and syndicated/bank loan markets) markets.
Many are also listed on overseas stock exchanges such as New York Stock Exchange (Infosys Ltd.), London Stock Exchange (“LSE”) (India Hospitality Corporation, Symphony International Holdings Ltd, Vedanta Resources Plc), Alternate Investment Market “AIM”) of LSE, Luxembourg Stock Exchange, Singapore (Meghmani Industries Ltd.) through their issue of American Depository Receipts (Infosys Ltd.) or Global Depository Receipts (Garden Silk Mills Ltd.).

This globalization\(^{47}\) index is made of

1. Access to Loan funds such as External Commercial Borrowings (“ECBs”)
2. Access to overseas bond markets via Foreign Currency Convertible Bonds (“FCCBs”)
3. Access to overseas capital markets via American Depository Receipts (“ADRs”) or Global Depository Receipts (GDRs”)
4. Overseas product market i.e. Exports (companies that have 2% or more of their sales from exports are classified as “exporting companies”)
5. Indian multi-national companies (Companies that have investment overseas are classified as MNCI)

Each of the sample companies is given 1 (if they belong to that category) else zero (0).

**Globally Integrated Companies**

**MNCs-Foreign**

\(^{47}\) The inspiration for constructing globalization index came to the author after reading Patnaik and Shah (2010) though they stop short of constructing the index by itself. So the errors in constructing this index can be attributed only to the author of this study.
Desai et al (2003) investigate how finances of US MNCs are vastly different from those of local companies in countries that they operate in. According to this study, these companies rely on “internal capital and money markets” for their requirement. Stylized facts mentioned earlier also support that MNCs Foreign have different capital structure with zero or negligible debt. These companies are generally characterized by low debt equity ratio and low long term debt in their total borrowings.

**Indian MNCs**

Large amounts of outward FDI since the late 1990s have given rise to what are called “Indian MNCs”. Many empirical studies are available that investigate the phenomenon of Indian MNCs (represented by likes of TATA Motors Ltd., TATA Steel Ltd. Ranbaxy Laboratories Ltd. Infosys Ltd).

Patnaik and Shah (2010) define those companies who have two or more percent of their total assets outside India as MNCs. This study, however, has classified those companies with non zero investment outside India as the Indian MNCs.

** Tradable vs. Tradable**

This is an important distinction. The companies with tradable output have earnings in foreign exchange and are able to hedge their foreign currency borrowing

**Access to Overseas Funds**

Globalised companies have access to overseas funds- loan (such as syndicated loan market of banks), debt and capital markets. The companies which have borrowed ECBs get score of 1 and others get zero. Likewise the companies that have borrowed through FCCBs get score of 1 and those who have not get zero. As
per the recent news item, Indian companies have outstanding Foreign Currency Convertible Bonds (FCCBs) of about Rs.31,500 crores

**ADRs/GDRs**

CMIE Prowess Database does not provide this information. This data base provides data on shareholding by custodians. Since there is a high correlation between shareholding by custodians and the listing overseas, the study has made an assumption that in case there is non-zero shareholding by custodians, the firm has raised funds through ADRs/GDRs. It may be noted that custodians hold shares on behalf of not only ADR/GDRs holders but also on behalf of other category of shareholders such as mutual funds.

**Holding by FIIs**

Since the focus of the study is on financial liberalization i.e. international capital flows and considering that FIIs are a conduit of these international capital flows, their shareholding in the sample companies is taken as a measure of globalization. The study has given a score of one to a company which has non-zero FII shareholding and zero to that which does not have FII shareholding.

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48 “Cos to face $7bn FCCB challenge”

Chapter 33: Macro Variable/s

Macro variable that is of interest and focus of the study is interest rate/s.

33.1 Interest Rate

Theory

The theories of interest rate determination are well known and hence not described and reviewed here.

Empirical Research

Money Market Interest Rate Determination

The literature on the money market interest rate determination in a semi-open economy can be classified under two main strands.

First, there is the approach that money market rate can be taken as a weighted average of the interest rate level determined through uncovered interest parity arbitrage. Various models of interest rate determination for economies with different degrees of financial openness have been developed (Edwards and Khan, 1985; Haque and Montiel, 1991). In some models, time-varying estimates of degree of openness are used as measures of the progress in the liberalization of the capital account of the balance of payments (Reisen and Yeches, 1993; Dooley and Mathieson, 1993).

An alternative approach for modeling interest rate determination has been proposed by Chinn and Maloney (1998). In these models, domestic interest rate is determined simultaneously as an outcome of a portfolio choice between non-interest bearing
money, domestic currency bonds, foreign currency-denominated bonds and domestic real assets

The value of the openness coefficient depends on the degree of substitutability between the domestic currency bonds and foreign currency. When the degree of substitutability between these securities is high, any differential between the domestic interest rate and the foreign interest rate would induce uncovered arbitrage activities. The resultant capital flows, by eliminating the initial portfolio stock disequilibrium, determine the level of the domestic interest rate.

**Economy Model -Fully Open Economy**

Gupta (1986) also (like Bhole and Sebastian 1996) tries to explain the behaviour of ex-ante real interest rates in Singapore during the period 1961-1981. He examines the determinants of nominal interest rates using a general equilibrium model incorporating the IS-LM model, the uncovered interest rate parity theory. He finds evidence that expected inflation, exogenous expenditures, monetary variables; supply shocks; inflation uncertainty and foreign interest rate determine nominal interest rates.

**Economy Model -Fully closed and fully open**

Edwards and Khan (E-K) (1985) estimated a reduced form equation, which allows for both open and closed economy factors to influence the domestic interest rate in the short run. The model was then tested for two countries, Columbia (1968-82) and Singapore (1976-1983). The results indicated that for Columbia both domestic and foreign factors were important. The openness parameter was found to be 0.84 which showed that Columbia was much more opened than one could tend to believe.
However, for Singapore foreign factors are dominant and the openness parameter was equal to unity.

**Economy Model-Transition-Fully closed to Open**

A number of researchers have extended the E-K framework to analyze the behaviour of interest rates. Bar-Efrat (1993) uses a modified demand for money function within the E-K framework analyses the extent to which world interest rates determine domestic lending rate in the case of Israel over the period 1973-90. He finds that the transition between extremely tight regulation regimes to a more liberalized one increases the dependence of domestic interest rate on world interest rate. He also finds that no such clear difference exists between a partially and a fully liberalized policy regime, and once financial channels are opened agents find their way around existing regulations. Gochoco (1991) also uses the E-K framework to analyze the determinants of interest rates in Philippines following liberalization. He finds that the relative importance of domestic versus external factors in determining domestic nominal interest rates depends on the degree of openness of the capital account. When capital flows are totally unrestricted, the domestic interest rate would be determined by the external factors via the uncovered interest parity relationship. If the capital account were completely closed, the domestic interest rate would be determined predominantly by domestic conditions via the Fisher effect.

On the other hand, Zilberfarb (1989) examines the determination of interest rate in a high inflation economy taking the case of Israel. He analyzes the importance of the liquidity effect, inflation uncertainty and supply shocks as determinants of interest rates. He finds that a significant liquidity effect exists when broad money is taken. Moreover, the strength of the liquidity effect is negatively related to the level of
inflation. Interest rates are determined by inflation uncertainty and positively related to supply shocks.

**Economy Model-Semi Open Economy**

Edwards and Khan (1995) develop an empirical model to analyze the behavior of nominal interest rates in a small semi-open economy. He investigates the role of world rate of interest rate, expected rate of devaluation and some more traditional domestic monetary conditions in influencing interest rate behavior. He tests the model using quarterly data for Columbia for 1968-1982 and finds evidence that the differentials between domestic nominal interest rates and world interest rates plus expected devaluation would lead to a higher domestic rate of interest. Moreover, excess in the supply of real money would exert significant negative pressures on the nominal interest rates. Unanticipated changes in nominal quantity of money will have a negative pressure on nominal interest rates whilst actual increases in the rate of growth of nominal money supply will leave the rate of interest unaffected.

**India (Economy Model-Semi Open/closed-Large Economy)**

Bhole and Sebastian (1996) analyze the determinants of interest rates in a deregulated open economy taking the case of India. Using a capital market integration model and the ratio-cum graphical analysis, they find that the Indian economy is partially deregulated and open. Inflation rate, exchange rate, international capital flows, interest rate margins and the need to foster savings have determined interest rate policy.

Ghosh and Acharya (2010) investigate the relationship between Overnight Interest rate Swaps and financial variables. They find that G-sec rate and call rate have
positive and significant correlation with the OIS rate, while Inflation rate is not contemporaneously related with the OIS rate. According to them, the other factor that significantly causes the OIS rate movement is the liquidity conditions in the Indian money market, measured by the difference between the call and repo rate. They also claim that the above factors remained crucial even during and in the aftermath of the global financial crisis.

Conclusion

The upshot of the preceding literature review is that research on interest rate determination in emerging markets including India has been quite limited.

33.2 Interest Rate Volatility

In their paper Bo and Sterken (2002) analyze the joint impact of the interest rate volatility and debt on firm investment. They derive an investment model taking account of the risk attitude of the owners of the firm. Using a panel of Dutch listed firms in the period of 1984–1995, they find that the cross-effect of the interest rate volatility and debt on investment is positive. This effect is more important for highly indebted firms than for less-indebted firms. The results are robust to different measures for the interest rate volatility. They interpret this finding by the tradeoff between the effect of the interest burden and the effect of debt revaluation.

In their paper Nengjiu Ju and Hui Ou-Yang (2005) develop a model in which an optimal capital structure and an optimal debt maturity are jointly determined in a stochastic interest rate environment. The model yields leverage ratios that are consistent in spirit with empirical observations. The maturity and the credit spread of an optimally issued debt are found to be smaller than the commonly observed values, indicating that factors not considered in a typical capital structure model play
important roles in determining them. They find that the long-run mean of the short-term interest rate process is a key variable in the determination of both the optimal capital structure and the optimal maturity structure. In addition, the volatility of the interest rate process and the correlation between the interest rate process and the firm’s asset value process play important roles in the determination of the debt maturity structure.

The traditional capital structure models, as represented by Brennan and Schwartz (1978), Leland (1994), and others, assume constant risk-free interest rates. Leland (1994) show that the optimal capital structure is very sensitive to the changes in the level of the interest rate. In other words, the level of the interest rate is a key input in those models. In the absence of explicit modeling of the interest rate process, however, the traditional capital structure models do not provide any guidance on which interest rate, such as the spot rate, the yield-to-maturity (YTM) of a risk free bond, or other interest-related variables, to use in the determination of the optimal capital structure. Because their results depend critically on the interest rate, without knowing which interest rate to use, the traditional capital structure models cannot be employed directly to explain the empirical observations. Another restrictive assumption that limits the applicability of the traditional models is that debt maturity is exogenously specified. Because the leverage ratio and the credit spread depend crucially on debt maturity, it is of great importance to determine jointly the optimal capital structure and the optimal debt maturity. In the absence of an optimal maturity structure, the optimal capital structure, as obtained in the traditional models, is of limited empirical relevance.

India
Considering that interest rate volatility in India is a phenomenon of 2000, there is limited empirical research. Patnaik and Shah (2004) examine interest rate volatility for identifying risk in Indian banking.

33.3 Term Structure of Interest Rates

33.3.1 Concept and Theories

There is not a single rate of interest. Instead there is a wide spectrum of interest rates representing variety of financial instruments, maturities, borrowers and lenders in the world. The yield\footnote{Yield is different from the coupon rate of interest as it is return on investment. For instance, the yield on the 7.8% GOI Bond due May 2020 was 7.60% as on July 7, 2011 (Bloomberg). Yield to Maturity is the yield an investor would receive in the bond is held to maturity. Yield Curve is the return on debt securities with different maturities, for a level of default risk.} curve (also called the term structure of interest rates in the academic parlance) is a graphical representation of the relationship between the interest rates of a homogenous (risk) type of (financial) instruments for a given borrower in a given currency for with various maturities. Since in reality, the yield curve function is actually only known with certainty for a few specific maturity dates, the other maturities are calculated by interpolation. Yield curves continually move all the time that the markets are open, reflecting the market's reaction to news. A further "stylized fact" is that yield curves tend to move in parallel (i.e., the yield curve shifts up and down as interest rate levels rise and fall).

Types of Yield curves and Borrowers

As there is no single interest rate, there is no single yield curve describing the cost of money for everybody. Different institutions borrow money at different rates, depending on their creditworthiness. The yield curves corresponding to the bonds
issued by governments in their own currency are called the government bond yield curve (government or sovereign yield curve\(^{50}\)). Large banks with high credit ratings borrow money from each other in international market at the LIBOR\(^{51}\) rates. These yield curves are typically a little higher than government curves. They are the most important and widely used in the financial markets, and are known variously as the LIBOR curve, etc.

Besides the government curve and the LIBOR curve, there are company i.e. corporate bond curves. They are constructed from the yields of bonds issued by companies. Since corporations have typically lower credit rating (than most large banks and governments), these yields are typically higher. Corporate yield curves are often quoted in terms of a "credit spread" over the relevant government /other curve. Spreads are quoted as basis points ("BPS") which are percentage points.

**Shapes of the Yield Curve**

It can have several shapes (inverted, flat, normal/upward sloping). As per the theory, since the long term bond will have higher interest rates and therefore higher yields than those for the short term, the yield curve which is upward sloping is called normal or concave. When long term interest rates are lower than short term rates, the yield curve is downward sloping or convex.

Before the deregulation of interest rates in India, all India financial institutions used to give term loans of five to seven years at 14% per annum while banks used to lend

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\(^{50}\) For Government of India, it is G-Sec Yield curve and for the USA Government, it is Treasury Yield Curve

\(^{51}\) London Inter Bank Overnight Rates
short term funds for working capital requirements at 19% per annum – a case of inverted or convex yield curve.

Source: http://yieldcurve.com/

Theories
The main theories that attempt to explain the differences in the yields are (1) Expectations Hypothesis; (2) Segmented Markets theory; (3) The Liquidity Premium theory; and (4) The Preferred-Habitat theory.

Historical Evolution
The collapse of the Bretton Woods System in 1970 i.e. delinking exchange rate from the gold standard made bond traders led by Liebowitz to think of bond markets in terms of plotting all yields along a curve with those near to zero known as short end and those farther as long end. The academics played catch up with Czech mathematician Vasicek developing one factor model of the yield curve in 1977.

33.3.2 Empirical Research
The study’s focus is on investigating the effect of financial liberalization on the yield curve in the first instance (in the macro part of the study) and then the effect of yield
curve on real economy, represented by the firms (investigated in the second part i.e.
firm level study).

The empirical research can be grouped into various categories as discussed below.

**Mathematical & Econometric models**

The first focus on the mathematical and econometric aspects viz., methodological aspects of the yield curve and hence is concerned with measuring, modeling and identifying the related issues. Starting in 1970s with the formulation of one factor model of Vasicek model (1977) and Cox-Ingersoll-Ross Model (1985)\(^5\), parsimonious models like Nelson-Siegel (1987) or Svensson’s fail to offer insight into the nature of the underlying economic forces that drive the movements of the yield curve.

**Testing of Hypotheses**

Macroeconomists focus more on the role of fundamentals of economy such as expectations of inflation and future growth, unlike financial economists whose prime focus is interest rate forecasting or bond pricing or market surveillance. Hence this strand tests various theories (such as expectations) of term structure of interest rates.

**Volatility of Interest Rates and the Yield Curve**

“The relative attractiveness of bonds with different maturities and coupons depends not only on the expected movements of future interest rates but also on the uncertainty surrounding these movements” Litterman et al. (1991).

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\(^5\) These models consider only market risk to be the principal reason behind the changes in interest rates.
Litterman and Scheinkman (1991) show how most of the variations in fixed income securities such as treasury securities\(^5\) can be explained in terms of three factors or “attributes” of the yield curve i.e. the level, slope/steepness and curvature.

**Yield curve –As a Repository of Information (Macro finance Model)**

Subsequent to the above interpretation by Litterman and Scheinkman (1991), Knez et al. (1994), Duffie and Kan (1996), and Dai and Singleton (2000) develop what are called “factor models”. However these models lack good macroeconomic interpretations.

**Uni-directional Model-Macro to Yield Curve**

Ang and Piazzesi (2003), Hördahl, Tristani, and Vestin (2002), and Wu (2002) explicitly incorporate macro determinants into multi-factor yield curve models. However, these papers only consider a unidirectional macro linkage because output and inflation are assumed to be determined independently of the shape of the yield curve, but not vice versa.

**Uni-directional Model-Yield Curve to Macro**

In contrast to this assumption of a one-way macro-to-yields link, the opposite view is taken in another large literature typified by Estrella and Hardouvelis (1991) and Estrella and Mishkin (1998), which assumes a yields-to-macro link and focuses only on the unidirectional predictive power of the yield curve for the economy.

**Bi-Directional Models-Macro finance models**

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\(^5\) US Government Securities

With a view to providing a characterization of the dynamic interactions between the macro-economy and the yield curve, Diebold et al.(2003) model with latent factors that summarize the yield curve (namely, level, slope, and curvature) as well as observable macroeconomic variables (real activity, inflation, and the stance of monetary policy). They find strong evidence of the effects of macro variables on future movements in the yield curve and much weaker evidence for a reverse influence.


Though the focus of Dewachter and Marco (2006) is on modeling consistently long-run inflation expectations simultaneously with the term structure, they also provide a macroeconomic interpretation for the latent factors (the level factor represents the long-run inflation expectation of agents; the slope factor captures business cycle conditions; and the curvature factor expresses a clear independent monetary policy factor) found in standard finance models of the yield curve.

**Yield Curve –As a Transmission Channel for Monetary Policy**

The central bank transmits its monetary policy through short term interest. In countries with well-developed financial markets, short term interest rate gets transmitted to along the entire yield curve and hence to long term interest rates.
When the central bank wants to adopt a tight monetary policy, it will sell government bonds/instruments, reducing the liquidity in the system. Likewise, the central bank can infuse the liquidity buying back government bonds/instruments. When the market expects the central bank to cut rates the shorter term instruments become expensive as they continue to offer higher interest or coupon rates. As a consequence, the yield declines, adjusting to the lower interest rate environment and the yield curve becomes steeper. On the contrary, when the market expectation is that the central bank will increase interest rates, the price of the debt instruments fall causing the yield to increase, and the yield curve flattens. The central bank’s decision to increase or decrease interest rates depend on the economic scenario in the country. If there is growth prospect in the economy, investment activity will be buoyant, resulting in increasing demand for money. This might lead to constant inflationary pressures. In such cases the central bank adjusts the fast rise in demand to the slower growth in supply, increasing the cost of money. Economic growth and inflation affect the yield curve as the monetary policy is largely influenced by the health of the economy.

Turnovsky (1989) analyzes the effects of monetary and fiscal policy shocks on the term structure of interest rates.

**International Capital Flows and Yield Curve**

*This strand* has Warnock and Warnock (2006) estimate that had there been no foreign official flows into U.S. government bonds over the past year, the 10-year Treasury yield would currently be 90 basis points higher.

**Yield Curve and Micro level Effects**
In the next strand, the *micro level*, Baker et al. (2003) argue that since they can time the market, corporate finance managers issue short-term debt when the expected return on short-term debt is below the expected return on long-term debt, and vice-versa. Refuting this, Butler, Grullon, and Weston (2006) argue that corporate finance managers do not have an edge over the sophisticated bond investors (such as PIMCO\(^{54}\)). Greenwood et al. (2008) agree with Baker et al. (2003) that corporate managers do have an advantage. However, they differ on the type of advantage and suggest that what corporate managers have is a comparative advantage viz., as providers of macro liquidity.

**India**


\(^{54}\) Pacific Investment Management Company (“PIMCO”) is an asset management company overseeing investments totaling more than $1 trillion on behalf of a wide range of clients, including millions of retirement savers, public and private pension plans, educational institutions, central banks, foundations and endowments, among others.
instruments. There have been similar studies by Bhoi and Dhal (1998) that provide evidence of the integration of financial markets in India. In the Indian scenario, the work by Kangasabapathy and Goyal (2002) closely resembles the study by Estrella and Mishkin (1998). Kangasabapathy and Goyal (2002) found yield spread, defined as the difference between long-term and short-term, to be a good predictor of real activity. Since bond and money markets began to acquire depth and breadth, the mid 2000s saw research in money market rate of interest rates structure (Shivam and Jayadev (2004) and also (Das (2009)) on how term structure responds to monetary policy actions in India. The most recent work is that of Kanjilal (2011) who investigates the dynamic linkages between the estimated parameters of a zero coupon yield curve and macroeconomic variables like inflation, gross domestic product growth in the presence of a monetary policy indicator in India for the period July 1997 to February 2004. This study finds that there exists strong causality from financial factors, defined by three parameters of the yield curves (‘Level’, ‘Slope’, ‘Curvature’) to macroeconomic factors; growth, inflation and monetary policy indicators (changes in the call money rate). However, the causality in the opposite direction is found to be weaker. Besides limitation of relatively short period of her study, Kanjilal (2011) does not consider the effect of international macroeconomic factors and shocks to economy (caused by the sudden stop of international capital flows). Perhaps the longer sample period from post Liquidity Adjustment Facility till 2010 might give different results.

**Micro Level**

includes Treasury bill yield, the Treasury bond yield, and the volatility of the yield curve) on the debt equity choice. Controlling well-known microeconomic determinants of financing decisions, he documents that as the T Bill yield rises, the incidence of debt financing increases. However, as T Bond yield or its volatility rise, the likelihood of debt financing drops. He finds that information content of the term structure of interest rates regarding aggregate corporate profitability (i.e. aggregate default risk) accounts for most of the observed effects. He also finds that tax shield distortions induced by change of interest rates marginally affect the leverage choice. Additionally, inflation cyclicality, corporate credit spreads, mortgage rates and personal income tax rates partially appear to affect the firms’ financing decisions materially.

**Conclusion**

No study in India has examined the nexus between the term structure of interest rates and firms.
33.4 Co-integration of Interest Rates Theory of Market Integration

The law of one price (LOOP) constitutes the fundamental principle underlying financial market integration. According to this law, risk-adjusted returns on identical assets should be comparable across markets in the absence of administrative and informational barriers. While the LOOP provides a generalised framework for financial market integration, finance literature provides alternative principles, which establish operational linkages among different financial market segments.

Term Structure of Interest Rates

Based on the principles of expectations, liquidity, market segmentation and preferred habitat, term structure of interest rates establishes integration across the maturity spectrum i.e. short, medium and long ends of financial market (Blinder 2004). Since the term structure of interest rates of government or sovereign yield curves are the most important as they are default free ("risk free"). Yield curve, as the study has discussed in the earlier section, contains useful information about future path of inflation and growth. Second, CAPM widely is used for pricing financial assets. CAPM uses risk free interest rate thereby establishing a link between risk free instruments (such as government securities) and market instruments (such as corporate bonds, commercial papers, etc.). Third, the Black- Scholes' principle of option pricing postulates linkage between derivative products on the one hand, and cash/spot market of underlying assets on the other. The often quoted put-call parity principle in finance theory states that a derivative instrument can be replicated in terms of spot price of an underlying asset, coupled with some borrowing or lending activity when no arbitrage opportunities exist. The forward-spot parity relation is used...
widely for analysing linkages between foreign exchange forwards and the money market instruments.

Apart from economic and financial principles outlined above, information efficiency (brought about by transparency and technology) can also enable financial markets as economic agents form expectations about future course of policy and real sector developments.

**Domestic Financial Integration**

“Domestic financial market integration entails horizontal linkages of various segments, reflecting portfolio diversification by savers, investors and intermediaries. Under horizontal integration, market interest rates typically revolve around a basic reference rate, which is defined as the price of a short-term low-risk financial instrument in a competitive and liquid market. It typically provides the basic liquidity for the formal financial system and central banks often use it to gauge the tightness of monetary policy. Domestic markets may be closely integrated because intermediaries operate simultaneously in various market segments; for instance, commercial banks operate in both the saving (deposit) and loan markets”\(^{55}\).

**Global Financial Integration**

“It refers to the opening up of domestic markets and institutions to the free cross-border flow of capital and financial services by removing barriers such as capital controls and withholding taxes. A deeper dimension of global integration entails removing obstacles to movement of people, technology and market participants

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\(^{55}\) Adapted from “Financial Integration” Chapter VIII RBI Report on Currency and Finance 2007
Global integration is promoted through harmonisation of national standards and laws, either through the adoption of commonly agreed minimum standards or the mutual recognition of standards (Reddy, 2005c).  

Empirical Studies

Many studies have examined India’s integration with the world economy. However, few have examined in the context of interest rates. Those who have examined global integration have focused on interest rate parity (Virmani). The study did not find any empirical research investigating domestic financial market taking interest rate except those contained in various publications of RBI mainly Report on Currency and Finance.

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Ibid
Chapter 34 Financial Liberalization

34.1 Concepts

34.1.1 Financial Liberalization

Financial liberalization has come to be typically associated with interest rate liberalization. However, financial liberalization includes a much broader set of measures. These measures may include those pertaining to the banking sector, the external sector, and the institutional framework of monetary policy.

Financial repression

Financial repression\(^{57}\) refers to an economic environment (typically found in developing countries) where “the financial system…is repressed (kept small) by a series of government interventions that have the effect of keeping very low (and often at negative levels\(^{58}\)) interest rates that domestic banks can offer to savers”\(^{59}\). The most common form of these interventions could be interest rate regulations, directed credit schemes\(^{60}\), and high reserve ratios\(^{61}\).

Motives for Financial Repression

\(^{57}\) Originated in the works of McKinnon R. I. (1973) and Shaw (1973)

\(^{58}\) Even today interest rates (4% per annum) on savings accounts are regulated and are negative in India

\(^{59}\) Agenor and Montiel (152:1996)

\(^{60}\) Indian banks still have to lend 10% to “priority” sector

\(^{61}\) Indian banking sector’s reserve (known as Statutory Liquidity ratio aka SLR) ratio was as high as 37.5%. Now it stands at 24%.
At the back of financial repression, motive is fiscal. Governments in such countries want to promote development while not having commensurate resources. Hence by imposing large liquidity and reserve requirements, it impounds resources. By issuing its own bonds (in India Government of India’s treasury bills and dated securities) in return for these reserves, governments create a captive demand for its own (interest bearing or non interest bearing) financial instruments and uses resources garnered to finance its own priority lending. Also governments put a cap on interest rates creating excess credit demand.

**Financial Repression-Cause of Distortions in Economy**

Financial repression causes distortion in an economy. McKinnon-Shaw hypothesized, repressing the monetary system fragments the domestic capital market with highly adverse consequences for the quality and quantity of real capital accumulation (McKinnon, 1988, McKinnon, 1993).

This would happen primarily through four channels:

1) the flow of loanable funds through the organized banking system is reduced, forcing potential investors to rely more on self-finance

2) interest rates on the truncated flow of bank lending vary from one class of favored or disfavoured borrowers to another

3) the process of self finance is itself impaired; if the real yield on deposit is negative, firms cannot easily accumulate liquid assets in preparation for making discrete investments; and

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62 Agenor and Montiel (152:1996)

63 All India Financial Institutions (such as the erstwhile IDBI, IFCI and ICICI) used to lend term loans with an interest rate of 14% per annum.

64 Loans to priority sector in India still carry lower interest rates than to non-priority sectors
4) Significant financial deepening outside of the repressed banking system becomes impossible when firms are dangerously illiquid and/or inflation is high and unstable; robust open markets in stocks and bonds, or intermediation by trust or insurance companies, require monetary stability.

**Solution - Deregulation of Interest Rates**

Since the regulated interest rates are a problem in financially repressed economies, the solution is obvious - deregulating i.e. liberalizing free interest rates rapidly, reducing reserve requirements, and eliminating directed credit schemes, while stabilizing the price level, say in the context of a strong disinflation program. It is expected that these measures would help countries grow faster. The logic being that subsequent to financial liberalization, investment and growth would pick up either because of a “complementarities effect”, i.e. the need to accumulate funds to undertake lumpy investments would make money and capital complementary (rather than substitutes) or because of a “credit availability effect”, i.e. increased savings into the banking system would increase investment through enhanced credit availability.\(^{65}\) In essence, to achieve all this, real interest rates must be kept positive by way of the freeing of rates while stabilizing the price level.\(^{66}\) Positive real interest rates resulting from financial liberalization is supposed to lead to financial deepening (or a higher level of intermediation), as demand for money, defined as savings and term deposits as well as checking accounts and currency increases as a proportion to national income, which in turn, is supposed to promote economic growth. Given

\(^{65}\) Agenor and Montiel (474:1996)

\(^{66}\) That is what Reserve Bank of India is trying to do
the important role played by interest rates in all this, removal of controls over interest rates has become the centrepiece of the liberalization process\textsuperscript{67}.

\textit{Financial Liberalization-Broader than mere Interest Rate Liberalization}

Today the term financial liberalization encompasses broader set of measures. Apart from interest rate liberalization and elimination of directed credits and high reserve requirements, financial liberalization entails a wide set of additional measures; both in internal and external sector.

\textit{Financial Liberalization-Internal Sector}

These could include the easing of portfolio restrictions on banks, changes in the ownership of banks, enhanced competition among banks, integration of domestic entities to international markets, as well as changes in the monetary policy environment. Agenor and Montiel (1996), following Park (1991), prefers to draw a distinction between \textit{monetary reform}, defined as an increase in controlled interest rates to near-equilibrium levels, and \textit{financial liberalization}, a much more ambitious set of reforms, directed at removing at least some of the restrictions on bank behavior (p.473).

\textit{Financial Liberalization-External Sector}

Of these, \textit{external sector reforms} go hand in hand with financial sector reforms because removing restrictions on exchange and payments system and establishing a freely functioning foreign exchange market are central to removing distortions that

\textsuperscript{67} Ucer (Undated unpublished)
limit portfolio behavior. Broadly, reforms involve two phases: removal of all restrictions on current payments and transfers, and capital account liberalization; the latter, by enhancing country’s integration with the rest of the world, imposes perhaps the strictest limits on financial repression. The objective of (financial) integration with the global economy (“globalization”) can be achieved through allowing (partly or completely) international private capital flows for investing in country’s economy.

**Institutional Reforms**

The reform of the institutional context of monetary policy implementation primarily entails increased independence for the central bank and a regime switch from direct instruments of monetary. Control (interest rate controls, bank-by-bank credit ceilings, statutory liquidity ratios, directed credits, bank-by-bank rediscount quotas) to indirect instruments (such as reserve requirements, credit auctions, primary and secondary market sales of bills, foreign exchange swaps and outright sales and purchases). The central idea here is for central banks to stimulate the growth of money markets and instruments with a view to allowing greater play of market.

In conclusion, while the early literature concentrates mainly on interest rate liberalization, the scope of financial liberalization extends into a number of more modern themes, most notably banking & financial crises and the liberalization of the capital account.

**Assessment of Financial Liberalization**

*Difficulty in Measurement*

It is difficult to make an assessment of the record of financial liberalization. Firstly, most experiences are of recent vintage while it takes several business cycles to
assess whether efforts have been successful or not (Atiyas, Caprio, and Hansen, 1994). And secondly, measurement creates a problem. It is difficult to determine exactly when liberalization efforts might have started and ended. Also, it is difficult to come up with single empirical that can measure the nexus between financial liberalization and performance under financial liberalization.

*Interest Rate and Performance*

If one were to construe financial liberalization as freeing of interest rates then performance of financial liberalization *is quite poor, in that “it appears to have been heavily associated with banking crises. However, financial liberalization, to the extent that it leads to financial deepening and development, appears to promote growth”* 68

*Early Record of Financial Liberalization*

It is known that the early record of financial liberalization, taken as an abrupt freeing of interest rates, is not that bright, as high interest rates, distressed borrowing, and numerous episodes of banking crises followed, most well-known examples being the early Latin American experiences of the late 1970s and early 1980s (e.g., Argentina, Chile, Uruguay) 69. These countries made serious efforts to end high inflation and to deregulate and privatize their banking systems. Interest rates on both bank deposits and loans were completely freed, with the latter often increasing to unexpectedly high levels in real terms. These attempted financial liberalizations generally ended in failure with an undue build up of foreign indebtedness and government intervention to prop up failing domestic banks and industrial enterprises.

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68 Ucer (Undated unpublished)

69 Ucer (Undated unpublished)
Sequencing of Financial—a Prerequisite for Success of Financial Liberalization

It seems then that, financial liberalization causes banking fragility, but through financial development, it tends to promote growth. How to reconcile these two conflicting arguments? Well, the conciliatory view seems to be that financial liberalization did not work because countries did not get the “initial conditions” nor the “sequencing of policies right”.70

What went wrong?

Research that tried to identify what went wrong with initial episodes focused on the peculiar characteristics of the financial markets. In hindsight, they argued, the key to the failures was ignoring a host of asymmetric information problems, of Stiglitz-Weiss variety, i.e. the so called “adverse selection” problem, aggravated by “moral hazard” as well as the weaknesses in the regulatory environment of banking systems in developing countries.

70 Indian policy makers appear to have learnt these lessons well as they have been sequencing measures (such as on capital control). This appears to be the reason perhaps India has managed to remain relatively unscathed by crises.

71 Asymmetric information often leads to a market problem that is known as adverse selection. Adverse selection occurs in a market when buyers or sellers would, on average, be better off trading with someone selected at random from the population than with those who volunteer to trade. It is a situation where sellers have information that buyers don't (or vice versa) about some aspect of product quality.
http://www.investopedia.com/terms/a/adverseselection.asp#ixzz1XiWSpLBz

72 People respond to incentives, and incentives are determined by costs and benefits. Because insurance changes the costs of misfortune, insurance should change people's behavior. They should make less effort to avoid misfortune, and this change in behavior is called moral hazard. For example, if an accident costs a person $1000 but insurance pays $900, the insured person has less incentive to take steps to avoid the accident or misfortune.
34.1.2 Financial Liberalization and Corporate Balance Sheets

The relative recent drive for financial reform in most countries has been spurred by the belief that the existing financial structure was not adequate to promote and assist growth in real economy (Schiantarelli et al, 1994). Therefore many developing countries moved away, in different degrees, from this structure labeled as “repressive financial structure” and introduced liberalization so that the market could play a greater role in the determination of interest rates and allocation of financial resources.

The advocates of financial globalization argue that the integration of countries with the world financial system can have many benefits, particularly for emerging economies with segmented financial markets. In a global financial environment, firms from financially underdeveloped economies gain access to mature financial markets, which are liquid and offer long-term financing. This integration also facilitates development of the domestic financial systems. As a consequence, the cost of capital decreases and financing constraints are relaxed. Furthermore, by issuing debt in foreign jurisdictions, with better contract enforcement institutions, the level of risk for lender decreases and borrowers have greater access to long term borrowings.

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73 At the macroeconomic level, international capital mobility could lead to a more efficient allocation of world savings, boost growth and investment, and help smooth consumption [Bekaert, Harvey and Lundblad (2004), Henry (2000a, b), and Obstfeld (1998)].

74 Fischer (1998) and Mishkin (2003)

75 [Bekaert and Harvey (2000), Edison and Warnock (2003), Lins, Strickland and Zenner (2003), and Stultz (1999)]

76 De la Torre and Schmukler (2005)
As a result of these perceived potential advantages, most emerging economies have liberalized their financial systems around the first half of the 1990s. Increasing financial integration of emerging countries with world financial markets has been made possible by lifting partly or fully restrictions on international capital flows ("ICFs") during the 1990s. The Foreign Direct Investment ("FDI") and portfolio investment form the major components of these international capital flows to emerging economies like India. As a result, companies from emerging economies have become active participants in international financial markets.

As these markets became increasingly reliant on these capital flows, crises began to erupt time and again in Mexico (1994), Thailand (1997), Russia (1998) culminating into the Global Financial Crisis ("GFC") which affected emerging economies in varying degrees.

The crises that started in the mid 1990s with the Mexican devaluation have, however, raised concerns that globalization increases risks, making emerging economies vulnerable to financial distress. Different risks are usually associated with globalization and crises. A central risk is the maturity risk, arising from the shortening of the maturity structure that exposes borrowers to potential rollover difficulties and interest rate fluctuations77.

77 A second risk commonly related to globalization is the over-borrowing syndrome, which arises because financial liberalization can generate lending booms and over-investment under the presence of moral hazard as in case of South Korea. As the expected rates of return are not realized, over-borrowing increases the chances of crises, McKinnon and Pill (1997). The third risk typically mentioned is the exchange rate mismatch, which occurs because of the increase in foreign currency debt, while the income of borrowing countries remains in domestic currency.[Jeanne (2000a and 2003), Eichengreen and Hausmann (1999), and Frankel and Rose (1996)].
The risk of maturity mismatch for emerging market firms has received considerable attention of researchers in recent years. The Asian Financial Crisis of 1997 sparked substantial interest in the nexus between financial globalization (more particularly financial liberalization) and corporate debt maturity.

Indeed, short-term debt has played an important role in the crises of Mexico (1994-95), East Asia (1997-98), Russia (1998), and Brazil (1998-99). The higher exposure to risks that globalization could bring about has led many economists to argue that countries should liberalize their financial systems gradually, and that those that have already liberalized might consider imposing some type of capital controls.

The international finance literature offers different explanations to why globalization might expose emerging economies to maturity risk. This literature argues that globalization can increase the maturity risk if it leads to exposure to international investors with information disadvantages, which may choose to lend short term to better monitor and discipline borrowers. Also, if international investors are more risk averse than domestic investors, the maturity structure would shift to the short term, as foreign investors would charge borrowers from emerging markets a higher risk premium on long-term issues than domestic investors. When short-term lending takes place, abrupt changes in market sentiment may trigger financial crises, as it becomes too costly for countries to roll over maturing debt. Bussiere et al. (2006) argue that if lenders are risk averse, higher uncertainty can (i) lower the total debt level a country is able to borrow and (ii) tilt the debt profile towards short-term debt.

It has also been argued that financial liberalization led to the shortening of debt maturity, as both firms and banks had increased access and hence choice over financing without proper regulatory systems. This led to increase in macroeconomic
fragility. Researchers and policy makers started to view financial liberalization through a new prism. On the aggregate (macro) level, reliance on short-term external debt may render the entire economy vulnerable to a collapse in output and investment due to reversals of international capital flows. Sachs et al. (1996), Furman and Stiglitz (1998), Radelet and Sachs (1998), and Chang and Velasco (1999) argue that excessive reliance on short-term external debt leaves emerging economies vulnerable to “financial panic” (Diamond and Dybvig 1983). Kaminsky and Schmukler (2001) synthesize the effects of financial liberalization that entail both short term pain and long term gain.

**Corporate Balance Sheets and Macroeconomy**

The relationship between corporate finance (balance sheets) and a country’s macro economy received increased attention from policymakers in many countries, especially those most affected by the Asian crisis.

Gray and Stone (1999) sets up the following links between the corporate sector and the macro economy are two-way.

**Macroconomy to Corporates**

First, macroeconomic developments can affect the health of the corporate sector, especially if corporates are highly leveraged and do business in an environment that does not promote sound corporate governance.

- Changes in world interest rates and country risk premiums can alter the cost of borrowing for corporates burdened by foreign debt.
• Rapid exchange rate depreciation can increase the debt servicing costs of firms with large foreign debts, destabilize the corporate sector and even threaten the viability of many firms.

• A high level of short term corporate debt denominated in foreign currency increases the vulnerability of the macro economy to exchange rate depreciation and sudden capital outflows.

• The adverse impact of tight monetary policy and high interest rates on domestic demand and bank lending, which have been used to stem rapid exchange rate depreciation, is amplified by high corporate debt and can therefore worsen the corporate sector’s financial situation.

**Corporates to Macroeconomy**

Second, the corporate sector can affect the macro economy through the following linkages.

• The restructuring of overleveraged corporates struggling to stay afloat financially can magnify an economic downturn by triggering the rapid disposal of assets at “fire sale” prices and prompting large investment contractions. In post-crisis Asia, the contribution of investment to real GDP in the highly leveraged countries is negative and very large.

• A squeeze on credit to corporates arising from a short fall of bank capital can force governments to divert their financial resources to their bank recapitalization.
Should the corporate sector get into insolvency, lower investment and the prolonged period needed for corporate restructuring can significantly impair real economic growth.

Analysis of corporate balance sheets, according to Schmulker and Vesperoni (2003) has several advantages. First, firm-level data facilitates investigations of effect of firms’ access to international markets on their debt structure ratios. All firms may not have equal access (both due to their inherent firm profile and characteristics and regulatory framework of the country) to international capital markets, even when the financial sector is liberalized. If markets are segmented and globalization opens new financing opportunities only to some firms, there will be differences in the financial structure of firms with and without access to international markets. Second, firms’ balance sheets have received increasing attention as their health is key to achieve financial stability. Further, as Krugman (1999) argues, deteriorated balance sheets can play a crucial role during crises and in their aftermath, as became evident in the South East Asia. Third, aggregate data on debt maturity of the private sector are not available in India (as in many developed and developing countries) on debt maturity structure, so firm-level data presents a unique opportunity to study this issue.

78 In India, not all firms can raise equity through American Depository or Global Depository issues And not all firms can raise borrow through “External Commercial Borrowings” given the Indian capital controls. Only those who meet certain “eligibility” conditions can do so.
34.2 Empirical Studies

The following paras review empirical studies that investigate balance sheets effects particularly debt maturity structure of various financial crisis. The review first discusses research carried out overseas and then in India.

Schmukler and Vesperoni (2001, 2006) investigate whether integration with global markets affects the financing choices of firms from the East Asia and Latin America. Using a firm-level panel for the 1980s and 1990s, the study examines how leverage ratios, debt maturity structure, and sources of financing change when economies are liberalized and when firms access international equity and bond markets. Based on their evidence, they show that integration with world financial markets has uneven effects on firms. On the one hand, the debt maturity for the average firm shortens when countries undertake financial liberalization. On the other hand, domestic firms that actually participate in international markets obtain better financing opportunities and extend their debt maturity. Additionally, firms in economies with more developed domestic financial systems are less affected by financial liberalization. Finally, the paper finds that leverage ratios increase during crisis times. A summary of these empirical studies is given at Table No.:

<table>
<thead>
<tr>
<th>Author(s)/Year</th>
<th>Region-Countries</th>
<th>Type</th>
<th>Obs/Sample</th>
<th>Yrs/Period</th>
<th>Variable</th>
<th>Findings</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schmukler and Vesperoni (2004)</td>
<td>Latin America and Asia-Argentina, Brazil, Indonesia, Malaysia, Mexico, South Korea, and Thailand</td>
<td>NCFs-Listed</td>
<td>686</td>
<td>1980-1996</td>
<td>LTD/STD/TD</td>
<td>Significant effect of globalization: Shorter maturity structure for an average firm. Firms relying on domestic markets shorten their maturity. Firms with access to international markets lengthen it</td>
<td>OLS</td>
</tr>
<tr>
<td>Guerriero, Federico (2007)</td>
<td>South Korea</td>
<td>NCFs-Listed</td>
<td>1275</td>
<td>1990-1994</td>
<td>LTD/STD</td>
<td>Increases in financial liberalization that accompanied the more general process of financial globalization have significantly reduced</td>
<td>OLS-Fixed Effects; Random Effects Tests</td>
</tr>
<tr>
<td>Iannacito et al. (2007)</td>
<td>Thailand</td>
<td>NCFs-Listed</td>
<td>284</td>
<td>1990-2001</td>
<td>LTD/STD</td>
<td>Debt maturity structure matters only during the sudden stop period</td>
<td>OLS</td>
</tr>
<tr>
<td>DHBencharit et al. (2009)</td>
<td>Asia-Australia, Malaysia, Singapore, Thailand</td>
<td>NCFs-Listed</td>
<td>1726 (Thailand)/403 (Malaysia)/116 (Singapore)</td>
<td>1993-2001</td>
<td>Firm and Country Inflation, Term Structure</td>
<td>The relationship between debt maturity structure and many of its determinants changed significantly after the crisis, both in size and direction</td>
<td>OLS-GMM</td>
</tr>
<tr>
<td>Bakos and Cowan (2010)</td>
<td>15 emerging markets</td>
<td>NCFs-Listed</td>
<td>3000</td>
<td>1980-2002</td>
<td>CA-CL Firm Characteristics</td>
<td>The effect of short term maturity on median is statistically zero, contrary to the prediction, for the whole sample as well as in both regions individually</td>
<td>OLS</td>
</tr>
</tbody>
</table>

Note: None of them includes India

Source: The Author's own based on review of these empirical research
As can be seen from the above, most studies pertain to the South East Asia. Of all countries affected by the Asian crisis of 1997-98, Thailand faced one of the largest capital inflow reversals\textsuperscript{79}. Firms that were highly leveraged found themselves highly constrained and had to make distress/fire sale of their physical assets. The debt maturity of Thai firms in the run-up to the financial crisis has been investigated by Charumilind et al. (2003) who find that firms with close relationships with banks are more likely to resort to borrow longer term. Iannariello et al. (2007) who investigate relationship between debt maturity structure and financial distress, find that the tradable sectors which had significant amounts of short term debt—about 80 percent of total debt prior to the crisis period, significantly worsened their balance sheets once capital inflow reversals took place.

Guerrero and Parker (2006) find a reduction in firms’ debt maturity prior to the Asian financial crisis for publicly traded firms of the South Korea. This study traces the origins of the shortening of corporate debt maturity in the South Korea back to the early 1990s when the process of globalization first gained momentum. Globalization is captured in their paper with variables such as financial liberalization, increased access to international bond and equity markets, and the increase in the development of the domestic equity and financial markets. A main finding is that a crucial factor behind the shortening of corporate debt maturity during the early stages of globalization was financial liberalization.

\textsuperscript{79} Iannariello et al.(2007) “Furthermore, Calvo and Reinhart (2000) estimated that the country had cumulative inflows as a percent of GDP of approximately 51.5 percent between the period 1988 and 1994 and that it suffered from reversals of 26 percent between 1996 and 1997.”
Closet to this study is that of Deesomsak et al. (2009) who investigates the effects of firm-specific and country-specific characteristics, and the 1997 Asian financial crisis on the debt maturity structure of firms in the Asia Pacific region. They indicate that firms in this region have a target optimal debt maturity structure, and the maturity structure decision of a firm is driven by both its own characteristics and the economic environment. Moreover, they also reveal that the crisis had significant effect on firm’s debt maturity structure and their determinants.

Using a large sample of 1500 and later 3000 publicly listed firms from fifteen (15) emerging markets\(^{80}\) (focus on Latin America and the East Asia) Bleakley and Cowan (2003, 2010) examine under capital-account volatility and find that the effect (of short term maturity on investment) is statistically zero, contrary to the prediction, for the whole sample as well as in both regions individually.

**India**


Schiantarelli and Srivastava (1996) investigate the determinants and consequences of the term structure of debt. Using a rich panel of data on privately owned Indian companies for the period 1980-89 (when interest rates were still regulated), they also examine the influence of debt maturity structures on those firms’ performance, especially on productivity. The results are not conclusive, but seem to support conventional beliefs about the importance of long term finance to firm performance.

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\(^{80}\) Does not include India
Heavy leveraging, however, has a strong negative impact on productivity. They base their econometric evidence on estimates of a maturity equation and of a production function augmented by financial variables. The data on which these results are based have been generated by a financial system in which there is little competition, in which state-owned financial institutions are not guided by the profit motive and have no control over interest rates, so one cannot say whether short term finance would have been more beneficial in a less regulated system. Moreover, by the end of the 1980s, the capital base of India’s government-owned financial institutions had been severely eroded and they carried a heavy burden of nonperforming assets. This means that the benefits of long term finance must be weighed against the costs.

Bhaduri, S. (2000) examines debt intensity in the wake of India’s financial liberalization by decomposing debt at aggregate level and its effect on capital structure. It attempts to decompose aggregate into “intensity” (to capture changes in intensity of debt within various industry sectors) and “structural” (to changes in debt due to changes in asset structure that might have occurred due to financial liberalization – leading companies to move towards more capital intensive industries, for instance). They find that changes can be attributed to the intensity instead of structural effect.

Prasad and Ghosh (2005) have examined the association and corporate behavior for a sample of manufacturing firms in India for the post-reform period 1992-2003. Their findings suggest that a contractionary monetary policy lowers overall debt including bank debt, although the lagged response is positive, and listed firms increase their short-term bank borrowings, after monetary tightening. The response of corporates to a monetary contraction in the post-1997 period has been more pronounced. A disaggregated analysis of responses of firms according to size and leverage largely
validates these findings. Based on this analysis, they derive 2 policy implications- the interest rate transmission channel has strengthened since 1998, and second, corporates in India, especially listed ones, seem to exhibit relationship lending.

Using panel data from 450 firms for a period of 12 years during 1992-93 and 2003-3004 Guha-Khasnobis and Kar (2006) identify factors (role of age of the firm, long term borrowing and net sales) which could explain the pattern of financing of manufacturing firms in India and key determinant of their debt structure. The focus of their study is on capital structure. Hence dependent variables are leverage and total borrowings with long term borrowing as one of the explanatory variables. They find that age displays a negative and non-significant impact on both the dependent variables (total debt and leverage), while long-term borrowing continues to be positive and significant all through. They conclude that while leverage as the more accepted measure of a firm’s debt market participation depends crucially on the level of the firm’s long-term borrowing and sales performances,

Majumdar (2010) examines the determinants of debt maturity structure determinants, using a sample of 366 (and 1830 observations) companies from two broad indices, viz., the BSE 500 and the CNX 500 index. The study results suggest that collateralizable assets and leverage are the important determinants of debt maturity choice. Size and firm quality have the predicted effect on debt maturity; however, results are statistically significant only in the case of fixed effect firm and time model. It finds no evidence of the impact of effective tax rate, asset maturity, and growth prospects on debt maturity in the Indian context.

Summary

As can be observed from above, there is no study investigating long term effect of financial liberalization and/or that of global financial crisis of 2008-9 on debt maturity structure of firms. Also there is no previous empirical study that examines the nexus between macro variables and corporate balance sheets.

Though there are different arguments on the impact of globalization on debt maturity, the empirical evidence is still scarce. This paper tries to fill this void by studying the effects of globalization on the debt maturity structure of firms operating in emerging economy like India. Financial globalization means the integration of countries with the international financial system. This integration is driven by two factors: (i) financial liberalization policies implemented by governments, and (ii) the actual use of international financial markets by firms. The focus on debt maturity is interesting because, as discussed above, the literature gives mixed predictions. Some arguments suggest that the maturity structure lengthens with globalization, while others predict a rise in short-term debt. The actual impact on debt remains an empirical question, which is the subject of this paper. This study tests the effects of financial liberalization by studying the behavior of debt as reported in firms’ balance sheets.