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Substitution between Debt and Trade Credit in the Capital Structure Decision of Indian Firms

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Abstract

We examine leverage choice issues of private vs. public, and group vs. non-group Indian firms during the preceding two decades. We include trade credit in measuring leverage as it is an extensively used form of debt financing in India. Indian firms employ high levels of leverage. Unlisted firm exhibit higher leverage, but such firms have moderated their use of leverage over the sample period. The difference in leverage across listed and unlisted firms is significant after controlling for the well-known determinants of capital structure. Access to capital via listing or group membership is thus a systematic determinant of leverage in India with listing status being more important than group membership. Listed firms exhibit higher variation in their leverage consistent with value-maximization; they use more (less) debt when the cost of equity is high (low).

JEL codes: G31, G32, G38

Keywords: Capital Structure, Group Affiliation, Unlisted Firms, Determinants of Leverage

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I. Introduction

There is an extensive body of theoretical and empirical literature in finance that attempts to explain the capital structure choices that firms make. Empirical studies have examined various aspects of such choices across different time periods, countries, and under differing market conditions to infer the rationale underlying the choice of a corporate capital structure. We examine the capital structure choice made by firms in an emerging economy: India.

India provides an interesting laboratory to study capital structure choices as the country has undergone substantial changes in economic policies and regulatory climates since 1991. We examine the evolution of corporate capital structure during the past two decades in response to policy changes while controlling for the known determinants of leverage. We focus on two broad classification variables: groups versus non-group affiliations, and listed versus unlisted firms, and examine their impact on the firm's choice of capital structure. The classification variables are proxies for firm's potential access to sources of external financing. Unlisted firms are unable to access capital from equity markets. Their access to bank and trade financing leads to higher levels of leverage in their capital structure. Group firms have the potential to take on higher leverage due to the higher debt capacity arising from coinsurance effects of group affiliation, implicit guarantees provided by group reputation, and the potential for preferential financing via intra-group transactions.

The impact of listing and group affiliations can be viewed from the context of the capital structure theories. Traditionally, the choice between debt and equity is viewed as a trade-off arising from market imperfections such as tax, agency, and bankruptcy costs. Asymmetric information between managers and outside investors leads to the pecking order theory of Myers and Majluf (1984) which claims that firms use internal funding first, external debt next, and equity as a last resort (see, Lemmon and Roberts, 2009 for the role of debt capacity). The agency theory proposes that debt reduces manager-investor conflicts and debt covenants are effective policies for monitoring

managerial activities (Jensen and Meckling 1976; Jensen, 1986). The three traditional capital structure theories implicitly assume that the capital structure is determined by the firm's demand conditions.

Faulkender and Peterson (2006) propose that companies with easier access to public debt exhibit higher leverage; a conclusion that is not forthcoming from the presented theories. They show that easy access to debt leads to higher levels of observed leverage. Managerial market timing effort may also lead to a capital structure which is an outcome of historical efforts and thus market cycles may influence the capital structure (Baker and Wurgler, 2002) – a view which is not forthcoming from the preceding theories. Implicit in the theoretical arguments cited earlier is the assumption that firms can issue equity. Firms without access to market capital face limited choices in their capital-raising efforts.

Non-listing or non-group status in India may pose difficulties in accessing capital. Non-listed companies are limited to the use of internal funds (profits), debt, and private equity. Existing owners of non-listed firms may be unable or unwilling to supply additional equity capital, and the prospects of attracting new shareholders may be remote. Further, listing status reduces the information asymmetry between shareholders and bondholders as more public information is available for listed firms, and managers can be monitored more effectively leading to lower costs of debt and equity. Higher debt capacity coupled with lower cost of debt may lead to the use of a higher level of leverage by listed firms. Conversely, listed firms having access to cheaper public equity capital may choose to employ lower levels of leverage.

A second issue arising from unlisted firms' limited access to equity is the impact on the speed at which the capital structure of such firms evolves over time. Unlisted firms are likely to exhibit sticky capital structures since they are able to leverage up more easily than they can leverage down. Unlisted firms may, therefore, choose to operate at a lower level of leverage than feasible and maintain greater financial flexibility. Given these arguments, the difference between the capital structure of listed and unlisted firms becomes an empirical issue.

Group firms have the ability to draw on the resources of the other member firms in the group including implicit guarantees, group reputation benefits, and potential inter-group credits which are easier to generate than bank loans. These factors may lead to an increase in the leverage of group associated firms, with unlisted member firms exhibiting higher levels of leverages.

Indian firms, on average, employ substantially higher levels of leverage compared to firms in the U.S. or in other developing countries. Firms tend to employ higher leverage in economies where banks are the major source of funding. Prior to the economic liberalization in 1991, banks were the primary source of capital to firms in India (Mohan, 2004). Fan, Titman, and Twite (2012) provide evidence that Indian firms use high levels of leverage with the median leverage of Indian firms being approximately two times that of U.S. firms. They state that "firms in countries that are viewed as more corrupt tend to use less equity and more debt."

Over the span of the previous two decades, the Indian economy has grown at a robust rate. Healthy levels of profits (internal funds) generated by economic growth coupled with easier access to market equity capital has caused a decline in the aggregate level of leverage, although the aggregate leverage continues to be substantially higher than that observed in the U.S.

The general availability of capital in the economy, due in part to the prevailing economic growth and regulatory policies, is likely to have an impact on the observed leverages. During the past two decades, the intended economic policies of the government have at times inhibited the corporate sector's access to capital. A market, subject to temporally varying policy constraints on access to capital with uneven impact across firms, provides a rich setting to study capital structure issues. In addition to the demand for debt based on the characteristics of the firm, controlling the structural constraints via listing status and group affiliation status provides richer insight into the capital structure issue.

Overall, we find that the aggregate level of leverage depends on the listing status and group affiliations in addition to the well-known determinants of capital structure such as profits, tangibility, size, growth, and average industry leverage. Because firm characteristics mostly control for firms' demand, our use of additional classification variables enable us to draw conclusions regarding the

importance of capital supply. We also find evidence supporting the "market timing" activity among firms who have access to the capital markets.

We provide a brief review of the liberalization of Indian markets and present our hypotheses in the next section. We summarize the data, sample selection procedure and related statistics in Section III. Our results are presented in section IV and concluding remarks are given in section V.

II. Economic Liberalization in India

2.1 The environment:

Until 1990, the state of financial sector in India could be characterized as a classic example of "financial repression" with administered interest rates and substantial micro-regulation of financial intermediaries. Firms obtained their debt from nationalized banks (Mohan, 2005). Extensive and complex regulations governed new equity issues and there was little transparency or depth in the secondary markets. The balance of payments imbalance faced by the country led to a major international payment crisis during 1989 – 1990 and it forced the body politic into relaxing various aspects of the economy. The Government of India promulgated extensive policy liberalizations with substantial impact on the economy, international trade, corporate, and financial sectors.

Economic liberalization started in 1991 and for a period extending beyond the next decade, many important policy changes were undertaken and policies unfriendly to economic growth were jettisoned. The economic liberalization eventually led to capital market liberalization and allowed many Indian companies to issue their securities in the market. Reforms in the banking sector, the industrial corporate sector, and the securities exchange were undertaken which permitted firms to have easier access to capital domestically and enabled firms to raise capital from abroad. New banks were allowed to prosper. Non-nationalized banks, however, accounted for less than 20% of the total bank assets in the Indian economy by 2010 (Herd *et al*, 2011).

The liberalization process was not a smooth process. Marisetty and Subrahmanyan (2010) discuss that there were three distinct phases of economic liberalization in India. The onset of liberalization (1990-1995) is considered a period of boom in the IPO market. IPO excesses including

insider trading eventually led to rule changes promulgated by the Securities and Exchange Board of India (SEBI) starting 1995. The new SEBI regulations made the IPO process more onerous, and led to increased restrictions on raising capital and a decline in the IPO activity and investor participation in the capital markets. Thus, the period 1996-2000 was a restricted phase for capital access and this had predictable consequences regarding the corporate capital structure during the period.

Subsequent to 2000, the third phase of economic liberalization started. Regulators learnt from their earlier mistakes of excessive tightening and made new rules to boost investor confidence and participation. Rule changes since 2001 have simplified some earlier rules and improved corporate access to capital markets. We find that, the aggregate leverage of listed firms in our sample changes in a manner that is consistent with the three distinct periods identified in Marisetty and Subrahmanyan (2010).

In the first period, with the IPO boom in the economy the aggregate level of leverage declines among listed firms; and the decline is reversed in the second period when IPO issuance is curtailed. In the post-2000 phase the decline in corporate leverage continues with normal levels of IPO activity and healthy levels of internal profit. Consistent with the hypothesis that unlisted firms tend to maintain financial flexibility, we observe that the leverage of unlisted firms appears to be less sensitive to the identified three phases but shows a gradual decline over the twenty year period.

2.2 Listing status and ownership affiliations:

We examine the capital structure of firms that are unlisted and those listed on exchanges. The listing decision, which is not endogenous in this study, has an impact on potential access to capital and on the debt-equity choice. Goyal *et al* (2011) study the differences in capital structures between listed and unlisted firms in eighteen European countries. We are not aware of any studies examining the listing effect on capital structure in the context of emerging economies. We expect unlisted firms to use higher levels of leverage compared to listed firms.

A “group” is a multi-company entity which operates in different product markets under common entrepreneurial and financial control. The group structure provides internal capital and

managerial resources to member firms when needed to overcome market imperfections in resource allocation. Large group companies in India are well positioned to create value in many corporate activities because of their superior managerial ability, processes, and ability to exploit the regulatory structure (Khanna and Palepu, 2000; Marisetty and Subrahmanyan, 2010).

The performance of Indian groups contrasts with the weaker performance of conglomerates in developed economies reported in the diversification discount literature. Khanna (2000) argues that belonging to groups affects management and capital raising processes and since firms are aware of this impact, they choose to be in groups. Manos, Murinde and Green (2007) examine the capital structure choice among Indian group-affiliated and independent companies, using a smaller sample covering a shorter period, and interpret the results to suggest that groups create internal capital markets and tend to employ higher amounts of debt.

Following these studies, a firm's leverage decision appears to depend on its ownership structure. Groups can provide explicit or implicit guarantees for their affiliated firms, and they may have internal capital market for members. Group-affiliated firms can reduce risk via coinsurance and experience a lower cost of default by having guarantees from other group companies. Thus affiliation with a group is expected to influence the capital structure of a firm.

2.3 Hypotheses:

Most of the earlier studies of capital structure focus on firm demand characteristics as the main determinant of capital structure and ignore the impact of supply side (Rajan and Zingales, 1995). Faulkender and Peterson (2006) find that firms with access to public bond markets exhibit higher levels of leverage after controlling for firm characteristics. Brav (2009) examines the impact of access to market capital on leverage using UK data and finds higher leverage among private firms, concluding that private equity is more costly than public equity. Leary (2009) shows that firms' leverage choices are affected by the availability of bank loan supply, providing support for the important role of capital supply in corporate capital structure. Sudden shocks to credit supply is also known to impact corporate financing (Lemmon and Roberts, 2010). Since our sample consists of

both listed and unlisted firms, we are able to examine the impact of market capital supply on firm's leverage. Listed firms have potential access to equity capital markets. They can employ equity for capital expansion, a choice that is not available to the unlisted firms. Based on financial flexibility concerns presented earlier, unlisted firms may prefer lower leverages but based on their limited access to equity unlisted firms may need to employ higher levels of leverage compared to listed firms; the actual leverage employed being an empirical issue.

As we discussed in the previous section, large group companies in India can exploit their access to the markets and institutions and such access may have a consequential impact on their leverage choice compared to non-group or stand-alone Indian firms. Firms with group affiliations have better access to primary suppliers of debt capital (banks), and ability to access foreign debt markets on account of their size and group-level capital raising expertise. More access to debt supply may lead to higher level of leverage in group owned firms compared to non-groups owned firms. Unlisted firms with group affiliations can utilize the implicit guarantee of the group to raise higher levels of debt capital. Further, unlisted firms within the group can have greater access to trade credit from other group members or from outside the group based on their affiliation.

Capital structure can be the outcome of previous management decisions to "time" the market (Baker and Wurgler, 2002). We examine the time-series variation of leverage across listed and unlisted firms after controlling for firm characteristics to test the hypothesis that listed firms exhibit market timing behavior. Our hypotheses regarding determinants of leverage are based on the following. Unlisted firms are exposed to higher information asymmetry, thus we expect stronger collateral-leverage relation in these companies. The level of contemporaneous (or, lagged) profits should impact both types of firms, but unlisted firms are likely to exhibit a higher sensitivity since profits or internal capital is their major source of capital for replacing debt. We also expect unlisted firms to exhibit a higher tendency to decrease leverage and maintain flexibility to prevent high cost borrowings in future unanticipated adverse states.

III. Data

3.1 The PROWESS database

We use the Prowess database for our study. Prowess is the most comprehensive database of Indian companies; including information on approximately 26,000 companies since 1988. The database is published by the Center for Monitoring Indian Economy (CMIE) in India. According to CMIE the aggregate turnover (sales volume) of Prowess companies in 2008-09 accounted for about 78% of India's GDP and the value of all listed companies in the database is about 47% of the total value of output in the non-agriculture and non-government services sector. These figures demonstrate that the database is an extensive source for research on Indian firms. All listed companies that are active on the major stock exchanges of India are included in the database as well as many less active firms trading on regional exchanges. Companies which have annual audited balance sheets or quarterly financial statements are included.[1]

One of the major advantages of the PROWESS database compared, e. g., to Datastream, is that it covers a large number of firms whose securities are not traded in the market. Non-listed firms account for about half the firms in our sample. Including the non-listed firms in our study has many advantages. First, inclusion of non-listed firms enables us to test the supply based hypotheses. Next, we are able to compare the responsiveness of listed vs. unlisted firms to factors that are known to influence the capital structure decisions. Lastly, we can study the relative volatility of leverage changes of listed vs. unlisted firms. We achieve a more complete understanding of the leverage decision of firms both at the aggregate level and at the firm level when we have data on non-listed firms as well as for listed firms. Conversely, including unlisted firms prevents us from analyzing market value based leverage measures and limits us to focus solely on book value ratios.

3.2 Sample Selection Criteria

[1] All registered companies, listed and unlisted, are required to file their financial statements with the Registrar of Companies. The quality, timeliness, and the details of the data from unlisted firms are likely to be less than that of listed companies which have to also meet Exchange and SEBI regulations.

We exclude all financial companies and obtain approximately 240,526 firm-year observations over the period, 1991-2010. Next, we exclude firms with missing debt or assets as we cannot compute the book value leverage ratios of such firms. We also exclude firms with total assets of less than 40 million rupees (approximately one million dollars). The ownership of the companies can be classified as; members of Indian business groups, Indian stand-alone firms, foreign-owned firms, and public sector firms. We exclude non-Indian firms since their capital structure may be influenced by access to foreign capital. We exclude all public-sector firms since the financial decisions of these firms are not necessarily based on value maximization (Gupta, 2005).[2] Our final sample consists of two ownership structures; firms in Indian groups, and Indian stand-alone or non-group firms.

We limit the firms in the sample to those that are not undergoing or approaching imminent financial distress. The capital structures of such firms may be unpredictably different from going concern entities. If a firm experiences substantial losses relative to its assets, we classify such firms as potentially distressed firms. Specifically, we cumulate the profits (losses) of each firm across all years in the sample. If a specific firm experiences substantial losses exceeding its average total assets for the period, (i. e., if $\left|\text{cum losses}\right|$ / average assets > 100%) such firms are considered distressed and are excluded from the sample. We truncate the top and bottom 1% by leverage, tangibility, size and return on assets. This procedure yields a final sample with 90,140 firm-years of observations covering a total of 11,240 firms over the twenty-year period, 1991-2010.

3.3 Sample Statistics

The National Industrial Classification code in India (NIC) follows a standard procedure for classifying economic activities. The NIC follows the procedures of United Nations' International Standard Industrial Classification (ISIC) of Economic Activities. The NIC-2004, which is 5-digit code, includes information from general categories (1-digit level) to sub classes (5-digit level). Since NIC-

[2] Firms with foreign ownership are excluded since they can access parent's financing, and they mimic the lower leverage patterns of their foreign parents. Public sector in India refers to government ownership either at the federal or state levels, and the firms are called Public Sector Undertakings (PSU). There are a number of firms which are part owned by the government but have some degree of investor participation. The managerial motivations, political considerations, and agency issues that guide the decision making of the PSU entities are different from the value based choices of investor owned firms.

2004 provides an industrial classification which is too-detailed for our needs, we map the codes into the more familiar Fama-French thirty industry classification by manually matching the industry descriptions on both sides. Sample firms appear in twenty-six of the Fama-French industries excluding financials. We have a limited number of observations in six industries and consolidate these firms in an 'Other Industry' category. Our final sample for subsequent analysis consists of a total of twenty-one industry groups including twenty Fama-French industries and an 'Other Industry'.

We provide an overall summary of our sample in Table 1. We show the number of companies in each industry and the corresponding average size firm. Fabricated Products, Food Products, Textiles, and Business Services represent a large number of firms. The Communications industry exhibits the highest asset size, possibly due to the growth of cellular communications during the past decade. Other industries with high average level of total assets include Transportation, Construction, and Steel Works. We use the industry classification in subsequent cross-sectional regressions where we control for the average leverage ratio by industry and the growth rate of the market size (total revenue) of the industry as two of the dependent variables.

[Insert Table 1 About Here]

3.4 Trade Credit as a Source of Financing

In emerging economies, with less developed debt markets and limited amounts of bank borrowing due to lack of competition among banks, firms often employ trade credit as an important source of financing. Trade credit may be more readily available than bank credit and the supplier of trade credit may often be in a better position to asses and monitor the conditions of the firm. The upstream supplier may have more timely information and greater ability to analyze the downstream firm compared to the banker who lends to multiple industries and may lack knowledge of conditions of a specific industry or access to timely information for the industry. The banker in a nationalized Indian bank may lack the motivation and incentives to respond to the borrower's short term needs.

Firms with limited access to capital markets in the U.S. use trade credit as a substitute for credit from banks and financial institutions. Suppliers lend to such firms because they have

informational advantage compared to financial institutions and can liquidate assets more efficiently should the borrowing firm enter unexpected financial distress (Petersen and Rajan, 1977). Trade credit is an important source of financing is less developed economies (Demirguc-Kunt and Maksimovic, 2001). They report that the level of bank debt is higher relative to trade credit in countries endowed with efficient legal systems in a sample of 39 countries they examine. McMillan and Woodruff (1999) study the role of trust relationship and extension of trade credit in Vietnam. They conclude that trust relationships are useful when formal legal enforcement of contracts are weak. Trade credit is offered by a supplier if it is difficult for the customer to find alternative suppliers, or if the supplier has information about the customer based on prior relationships, or if the supplier has an existing network relationship with the customer.

Cunat (2007) suggests that trade credit is a consequence of normal commercial transactions between a supplier and borrower. Such arrangements exist although they are more expensive for the borrower compared to bank financing, especially in the case of fast-growing firms. Suppliers have an advantage over banks as they can stop supplying goods to the borrower approaching financial distress. Conversely, suppliers act as liquidity providers to the borrower when the distress is not due to liquidity. These arguments appear to have great applicability to the prevailing conditions in India, as banks face higher asymmetric information, manufacturing companies grow at a fast rate due to economy-wide growth, and upstream suppliers can and do provide trade credit as an alternative to banks.

Allen *et al* (2012) examine the financing practices of Indian firms and find that alternative financing including trade credit constitutes the most important form of external finance at 30% of the total financing. Bank financing is the second preferred financing mode and constitutes 18.2% of the total financing. Bank financing is backed by legal contracts whereas alternative financing relies on non-legal enforcement mechanisms such as reputation, relationship, and trust. They argue that although India is endowed with a strong set of regulations and English-law (common law) tradition, enforcement of investor protection is weak due to inefficient and corrupt judicial and financial

institutional structures. For many firms, especially for smaller firms, alternative finance can be a preferred source of financing in India compared to financing from banks or financial markets.

In studies with U.S. or advanced economy data, leverage is usually defined as the ratio of total debt to total assets, where total debt is typically the total of long and short term debt. In view of the importance of trade credit in the financing of Indian businesses, we compute a ratio of the total liability (debt + current liability) to total asset as the appropriate measure of leverage. The use of trade credit as an alternative to bank credit is a likely choice for many firms.[3] This measure of leverage in the Indian context provides a better indication of the indebtedness of a firm in spite of possible differences in legal treatment of the types of debts and their maturity structures. Summary statistics of debt ratios, firm level characteristics, and their correlation matrix is presented in Table 2. Broadly, the direction and magnitude of the correlations are similar across listed and unlisted firms.

[Insert Table 2 About Here]

We compare the leverage levels among listed vs. unlisted firms and group vs. non-group companies, and find that there is significant variation in leverage across these classifications. Listed firms are presumed to have better access to capital market and are better able to raise public equity – leading to a lower level of leverage compared to unlisted firms. Interestingly, listed firms have higher debt to total assets ratios compared to unlisted firms since listed firms are likely to prefer the legal certainties and the lower cost associated with bank debt compared to alternative financing arrangements employed by unlisted firms described in Allen *et al* (2012). Unlisted firms obtain their financing from internal capital, private equity, and debt, and they have higher levels of leverage. We find initial support to our hypothesis that the level of leverage depends on the listing status and ownership structure which can be interpreted as proxies for the firm's access to sources of capital.

[3] There appears to be a systematic substitution between current liability and debt across the listing and group affiliation classifications (see Table 3). We find that the substitution between debt and current liability holds at the level of the firm. We examine, but do not report here, the determinants of debt to total asset ratio and the current liability to total assets ratio in a system of seemingly unrelated regressions using equation 1. The error structures of the SURE regressions are negatively correlated. The hypothesis of uncorrelated errors is rejected by a Breusch-Pagan test of independence.

We provide some evidence regarding ROA and tangibility in Table 3. Listed firms exhibit lower levels of profitability but higher levels of tangibility relative to unlisted firms. Lower levels of profitability may imply the need for higher levels of external funds, and higher levels of tangibility would provide higher levels of collateral to undertake higher levels of debt. Based on profits and tangibility, we should expect to see a higher level of leverage for listed firms. We observe, however, a significantly lower level of leverage for listed firms. This result suggests that access to equity markets may be the primary determinant of the (lower) leverage of listed firms. Conversely, lack of access to equity capital may be the major driving factor behind the (higher) leverage decision of unlisted firms. Access to capital may trump the traditional firm specific factors such as tangibility and ROA. We do a regression analysis to examine the differences in leverage between classifications.

[Insert Table 3 About Here]

IV. Analysis of leverage

The observed difference between listed and unlisted firms may be attributable to the difference between their level of profits and other firm and industry level characteristics. In order to preclude this possibility, we estimate the impact of listing status and ownership structure by controlling firm characteristics and specifying a standard model that is used often in the literature:

$$TLA_t = \alpha + \beta_1 Tangibility_{t-1} + \beta_2 Size_{t-1} + \beta_3 Growth_{t-1} + \beta_4 Profitability_{t-1} + \beta_5 Industry\ Leverage_{t-1} + \beta_6 Risk + \beta_7 D_{Listing} + \beta_8 D_{Group} + \varepsilon_t \quad (1)$$

TLA is the ratio of total liabilities to total assets. Total liabilities include all borrowings and current liabilities and total asset is the book value of assets. The control variables are; **Tangibility**, the ratio of fixed assets to total assets; **Size**, the natural logarithm of total sales revenue; **Growth**, the percent change in industry total assets at time *t* compared to the assets at time *t-1*; **Profitability**, the ratio of net income to total assets (ROA); **Industry leverage**, the average for the industry based on the Fama-French 30 industry classification; and **Risk**, a measure the sales variability of the firms and computed as the ratio of the standard deviation of sales revenue for all years to the average sales revenue for all years for a firm. For robustness, we have employed other variables to measure;

the effect of size by total assets, growth by the growth of the total industry revenue, and other measures of variability with very similar results. We have also used contemporaneous variables on the right hand side of the regression equation and obtain similar results. Our focus on the model with lagged regressors mimics managerial choices since managers are likely to make decisions for next period's leverage based on firm characteristics known in the current period.

4.1 Determinants of Leverage

The ratio of total liabilities to total assets is the measure of leverage that we employ as our dependent variable. We hypothesize that the level of leverage depends on the listing and group status as proxies for ease of access to capital. We discuss below the hypotheses regarding the control variables in the regression equation.

Tangibility: Highly levered firms may invest in risky and negative NPV projects, and if a large loss occurs the bond holders suffer. Based on an agency cost perspective Jensen and Meckling (1976) and Myers (1977) view the relationship between leverage and investment risk to be positively correlated. Tangible assets reduce the bondholder-shareholder conflict as they are easy to collateralize. Several empirical studies including Rajan and Zingales (1995) and Frank and Goyal (2009) argue that tangibility is positively correlated with leverage; firms with high levels of tangibility, measured by the ratio of fixed assets to total assets, are likely to be more levered.

Size: Larger firms are likely to be more diversified in different lines of business and thus are likely to face a lower probability of default on their debt. The likelihood of lower financial distress may enable the larger firms to undertake higher level of leverage. Conversely, large firms are more scrutinized and analyzed by the investment community – leading to lower degree of informational asymmetry between the managers and outside investors. Under this scenario, lower cost of equity is likely to lead to lower levels of leverage. Empirical studies have also found mixed relationships between size and leverage (Rajan and Zingales, 1995).

Growth: Trade-off theory predicts that growth is negatively correlated with leverage. Firms with high market-to-book ratio (implicit high growth) have higher costs of financial distress which

increases the cost of debt. This is in line with market-timing as well, firms issue equity when price is perceived to be high or with high market-to-book ratio. Arguably, growth opportunities may be positively correlated with leverage according to the pecking order theory. Since unlisted firms do not have market values we use industry level asset growth as a proxy for growth measure. Firms need to have capital in place to support future growth. If a firm is unable to raise capital from internal or external equity sources, the level of debt and leverage will increase. Thus, we expect to see a positive relationship between leverage and growth if internal or external equity capital is not sufficient to support the investment and asset expansion needs.

Profitability: Leverage can be viewed as a consequence of the growth of the firm, and the growth financing depends on profitability and a host of other firm level variables. The debt servicing ability also depends on the profitability of the firm. The likelihood of financial distress is decreased in profits. Trade-off theory, however, suggests that as firms' internal funds are preferred to external funds, high level of current profits should lower future leverage. In the literature, there is extensive evidence that profitability is negatively related to the level of leverage (Frank and Goyal, 2009).

Industry leverage: Industry average leverage is broadly used in the literature as a measure of the target capital structure for a firm. Firms in a specific industry are exposed to common factors and industry leverage reflects the type of assets, risk and technology (Frank and Goyal, 2009). Additionally, smaller firms or less externally scrutinized (unlisted) firms may be advised by banks or debt providers to follow the industry leverage and counseled to avoid deviating from the norm.

Risk: Firms with risky cash flows are likely to use lower leverage compared to firms with steadier levels of cash flow. We expect a negative correlation between risk and leverage. Frank and Goyal (2009) report a negative relation between risk measured by "stock return variance" and leverage. They argue that according to trade-off theory risk should decrease leverage because it reduces the probability that tax shields are fully utilized. It is possible, however, that riskier firms choose to use higher level of debt in order to cause wealth-transfer from creditors to shareholders. Such gaming behavior would not be inconsistent with the institutional reality of weak protection afforded to investors in India.

Access to Capital: The dummy variables for Listing (value of 1 if listed) and the dummy for Group (value of 1 if group member) provide measures of access to capital. In particular we would expect the non-listed firms to use higher degrees of leverage due to lack of access to equity and the coefficient attached to Listing would thus be negative. Since group members have better access to debt capital we expect the coefficient attached to group to be positive.

4.2 Regression Results

We report the results corresponding to regression model (1) in Table 4, Column 1. Standard errors clustered by firm as suggested by Petersen (2009). We do not find any significant relationship between leverage and tangibility. Leverage is positively related to size, growth, and risk. Leverage is also positively related to industry leverage with a coefficient of the order of 0.51. Leverage is negatively related to profitability. The impact of listing and group affiliation on TLA are obtained from the respective dummy variables, the listing dummy has a -6% coefficient, i.e., listed firms have lower levels of leverage compared to unlisted firms, and the group dummy has a +3% coefficient, i.e., group firms exhibit higher levels of leverage compared to stand-alone firms.

We estimate the standardized betas to measure the relative importance of the variables in column 2. The standardized beta of ROA, at -0.50, is the largest of all variables. This suggests a strong substitution between internal and external capital which is consistent with the predictions of the pecking order theory. Firms with low levels of profit and low amounts of internally generated capital, use debt capital to fund their investments and operations first, and do not raise external equity. Industry leverage is the next strongest variable with a standardized beta of 0.12, which is approximately a quarter as strong as ROA. Between listing and group effects we find that the listing effect, at -0.08, is two times as strong as the group effect. We are inclined to draw the preliminary conclusion of an asymmetry; for unlisted firms the lack of access to equity capital is a much stronger constraint compared to the relative ease of access to capital afforded to group firms by their structure. The difference in leverage across firms is driven by systematic classification factors, listing

and group, in addition to firm level characteristics. The model explains 28% of variation in leverage which is comparable to those reported in the literature using US or European data.

In the previous model, we assumed that listed (group) and unlisted (non-group) companies respond to firm level characteristics in an identical manner. Implicitly, the impact of listing and groups was assumed to be a shift on the intercept. We examine the differential impacts on the coefficients of the independent variables by crossing D_{List} and D_{Group} respectively with the other independent variables following equation (2), where D refers to either of the dummy variables.

$$TLA_t = \alpha + \beta_1 D \times Tangibility_{t-1} + \beta_2 D \times Size_{t-1} + \beta_3 D \times Growth_{t-1} + \beta_4 D \times Profitability_{t-1} + \beta_5 D \times Industry\ Leverage_{t-1} + \beta_6 D \times Risk + \beta_7 Dummy + \varepsilon_t \quad (2)$$

We report the results in Tables 4, columns 3 and 4 for the listing effect and columns 5 and 6 for group effects. Listed dummy is -5% and group dummy is +3% similar to the finding in column 1. The direction of response is positive for all subsamples on growth, industry leverage, and risk. We examine these variables first. When we analyze the marginal effects we gain further insight into the capital raising process and the capital structure decisions.

The coefficient attached to tangibility for the overall sample is zero. In each of the sub-samples, however, tangibility is statistically significant but in opposite directions. In the unlisted sub-sample it is negative and is positive in the listed sub-sample. Unlisted firms use less debt (38.8% vs. 41.3%) but employ substantially higher levels of current liabilities (29.4% vs. 22.8%). The level or use of current liability is unlikely to be linked to the tangibility level. High degree of substitutability between debt and current liability leads to lowered reliance on tangible assets for these firms. Similarly, group firms employ a higher level of current liability (27.4% vs. 24.9%), and a marginally higher level of debt (41.1% vs. 39.6%), with total leverage ratios being 68.5% vs. 64.5%. We do not see the substitution behavior here, and the tangibility coefficient for this class presents a puzzle.

Unlisted firms display no size sensitivity to leverage, but listed firms have positive response, i.e., larger listed firms employ higher degrees of leverage. Group firm's leverage is negatively related to size, i.e., smaller group member firms employ higher leverage compared to larger group firms. When we dichotomize the group firms based on size, we find that the larger sized group firms exhibit

substantially higher levels of profitability compared to smaller sized group firms, with median ROA of 3.5% vs. 1.5%. This is consistent with the results reported in Khanna and Palepu (2000). The more profitable larger sized group firms need lower leverage compared to the less profitable lower sized group firms. Similar dichotomization of the stand-alone firms reveals that larger firms exhibit higher levels of profit than smaller firms. Larger stand-alone firms, however, use greater levels of leverage.

The marginal coefficient on growth is significant and positive for each of the sub-samples. Listed firms have access to equity but they do raise greater amount of debt in financing growth compared to unlisted firms. It appears that mere access to markets eases the raising of debt capital. The marginal effect of growth on the stand-alone sub-sample is not significant, with both group and stand-alone firms displaying similar levels of growth-leverage total sensitivity.

For industry leverage, listed firms exhibit a significantly higher coefficient indicating that they track the industry benchmark more than do unlisted firms which exhibit greater levels of idiosyncratic variations. Stand-alone firms also track industry leverages more than do group firms. We conjecture that group firms follow the group leverage norms more closely than the industry benchmark. The coefficient on risk-leverage sensitivity behaves similarly for each of the sub-samples.

ROA-leverage sensitivity is negative in all sub-samples. The marginal effect of stand-alone firms is zero. The marginal effect of listed firms is a significantly negative -0.44. Listed firms respond more quickly to profitability changes in adjusting their leverage than do unlisted firms due possibly to better access to raise capital and a lower need to maintain capital structure flexibility.

[Insert Table 4 About Here]

We have conducted multiple types of robustness checks. We have employed alternative measures for the variables of interest including measuring firm leverage as a deviation from industry average, using the lagged level of leverage as an independent variable, and have used different definitions of independent variables, and have estimated contemporaneous regressions. The robustness checks yield results that are broadly consistent with those reported in Table 4.

4.3 Estimating the impact of access on leverage

Our first estimate of the relative importance of listing and group status is based on the coefficients attached to the respective dummy variables shown in Table 4. The listing dummy is -5% compared to +3% for group dummy. Thus, listing effect appears to have a stronger impact on leverage compared to the group membership status.

We employ an alternative approach to obtain the impact of the access measures. One may argue, for instance, that listed firms are less levered simply because they are more or less responsive to the dependent variables in the regression. In that case, applying the listed firms' estimated coefficients to unlisted firms data would an alternative approach to control for the impact of the listing status. We can obtain the predicted leverage of the unlisted firms based on the listed firms' coefficients. The difference between the predicted and actual leverages of unlisted firms may therefore provide a more reliable measure of the impact of listing status. We use various sub-samples to predict out-of-sample leverage ratios. We compare the means and medians of the observed and predicted leverages and also report their differences in Table 5.

The observed level of leverage for the listed sub-sample is 63.58% against the predicted leverage of 68.66%, implying a -5.09% impact of listing on leverage as we show in column 1. The listing effect is -6.12% when we compare the medians. We obtain a second estimate of the impact of listing by using the listed sample's regression coefficients to predict the out-of-sample unlisted firm's leverage. As we show in column 2, the average impact is 5.99% (median, 5.47%). Unlisted firms thus exhibit a higher average level of leverage, in the range of 5.09% to 5.99%, on account of their lack of access to equity capital for investments and operations.

We estimate the effect of group membership and report the results in columns 3 and 4. Group firms have higher average levels of leverage compared to non-group firms ranging between 1.20% and 4.74%. The value of the group effect appears to be smaller and more sensitive to specification of the baseline equation than the robust effect of listing observed in columns 1 and 2. Since unlisted (group) firms have higher levels of leverage than listed (non-group) firms, we can combine both effects to compare the difference between unlisted-group firms and listed-no-group

firms. As we show in columns 5 and 6, the combined effect leads to a higher average level of leverage in the range of 6.78% to 8.96%.[4]

[Insert Table 5 About Here]

4.4 Leverage at the aggregate level

In addition to the firm level analysis, we also examine leverage at the aggregate level to gain further insight to the choice of the level of leverage and the adjustment process to effect changes in leverage. Indian economy grew at a rapid pace during the various time periods of our study. The leverage ratio for the sample period changes in keeping with the three periods identified by Marisetty and Subrahmanyam (2010) and shown in Figure 1.

The economic liberalization policies as undertaken in India resulted in a spurring of domestic demand in the economy as well as foreign exports leading to 12% to 14% annualized growth in GDP. The industrial sector experienced significant growth as a consequence, leading to asset growth and capital expenditures at the firm level. Financing of growth in the corporate sector came from internal funds (profits), from trade credit, from institutional debt, and by accessing the equity markets (Allen *et al*, 2012). The growth in corporate debt levels resulted in a significant growth in bank lending. Bank assets grew at an annual rate of 22.8% in the second phase, and at a lower rate of 8.3% during the third phase. The GDP growth and growth rates in aggregate banks assets are obtained from Datastream.

[Insert Figure 1, 2 About Here]

We present the leverage levels in Figure 1. Listed firms show lower levels of leverage. In the second panel of Figure 1, we present the annual average change in TLA by listing classification. In order to examine whether listed firms respond to market and other aggregate factors that influence leverage more readily than do unlisted firms, we provide the graphs of the average annual changes

[4] We compare the other diagonal entries in our classification, those of listed group firms with unlisted non-group firms but do not report the results in Table 5. We find that the net effect on leverage is between 0.36% and 2.23% reinforcing our observation that the impact of group classification is weaker than that of listing classification on leverage.

in leverage. Unlisted firms have limited ability to change their leverages, by internal financing or by either reducing or increasing their total liabilities. We conduct two sets of tests to examine whether listed firms adjust their leverage ratios more than do unlisted firms, and report these in Table 6.

In Panel A, we present the comparison of means test for three alternative measures of changes in leverage. We report the ΔTLA for unlisted firms and compare them to those of listed firms in the first row of Panel A. The listed firms, on average, exhibit higher ΔTLA than do unlisted firms. Over the sample period, the difference-in-difference is a highly significant 1.17%. This suggests that the listed firms adjust their leverage levels in response to aggregate conditions more readily than do unlisted firms.

This test does not preclude the possibility that the ΔTLA of the unlisted firms may be switching signs more often leading to a smaller average value. Therefore, we examine the absolute level of the annual changes across the two classes. We compute the annual |ΔTLA%| by listing classification and the difference means is 0.84% higher and statistically highly significant, for the listed firms. Lastly, we apply a regression equation similar to (1) excluding the dummy variables for each sub-sample, and collect the residuals. We compare the absolute values of the residuals, |ε%|, across the classifications, since the average value is zero, and find that listed firms exhibit higher level of unexpected changes of 0.63% from the model, compared to unlisted firms.

We provide an alternative set of tests in Panel B to examine whether listed firms respond to aggregate conditions by making more frequent adjustments. This question can be answered by comparing the variability of ΔTLA, |ΔTLA%|, and |ε%| between listed and unlisted firms. The variance ratio tests indicate that listed firms exhibit higher degree of variability in the leverage adjustment process compared to unlisted firms. This suggests that listed firms increase and decrease their leverages by greater amounts and possibly with higher frequency compared to unlisted firms. In summary, listed firms appear to manage their total leverage more than do unlisted firms, largely due to their access to different sources of capital.

[Insert Table 6 About Here]

V. Conclusions

Our paper supplements recent studies on the importance of source of capital supply and managers' market timing behavior. Using a comprehensive sample of Indian firms spanning 1991-2010, we find that firms with no access to market capital tend to use higher levels of leverage, compared to firms having access to equity markets. During the study period, the overall level of leverage has declined partly as a consequence of generated internal financing. Higher levels of leverage among unlisted firms cannot be explained by profits or other important determinants of capital structure. We also find evidence on the relationship between ownership structure and leverage; firms belonging to business groups employ higher amounts of leverage. However the impact of ownership structure on leverage is smaller than that of listing.

The listing effect reduces reliance on leverage to the extent of 5 to 6%, whereas group affiliation increases the potential for leverage by approximately 3%. The overall effect of unlisted and group affiliated firms is of the order of 6.8% to 9% relative listed and non-group affiliated firms after controlling for the known determinants of leverage. The role of access to capital thus has a significant impact on the observed leverages of Indian firms.

We investigate the market timing behavior of listed firms at the aggregate level. Listed firms show higher variation in their leverage between years compared to unlisted firms. The variation in leverage of listed firms coincides with market conditions, and is therefore consistent with the argument of managerial market timing behavior.

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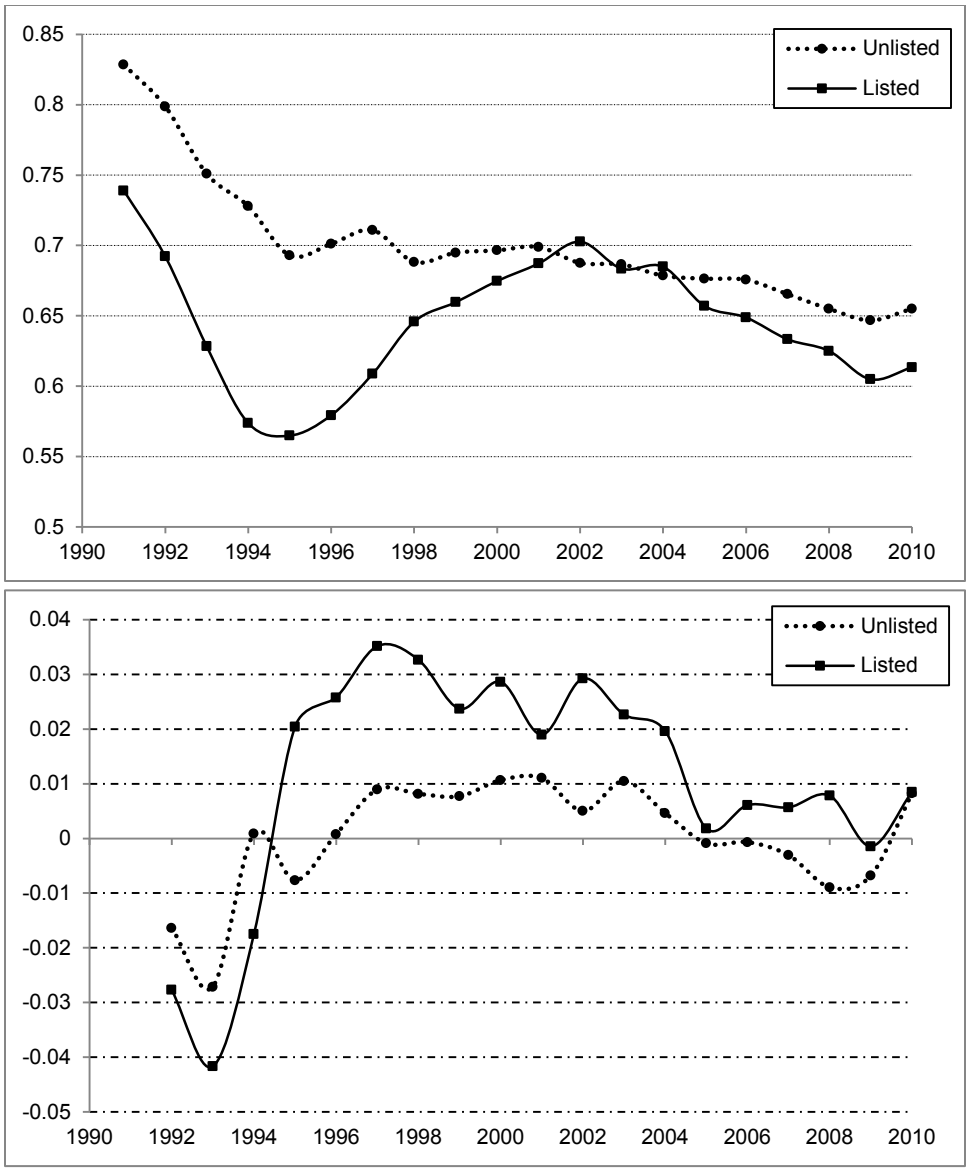

Figure 1. TLA and change in TLA. Graph displays the trend in the ratio of Total Liabilities to Total Assets (TLA, in percentage) for unlisted (dashed line) and listed firms (solid line) for the period 1991-2010. The second chart shows the change in annual level of TLA in percentage (ΔTLA%) across listed and unlisted firms. For each year, change in level of TLA for listed (unlisted) firms is displayed in the left (right) column.

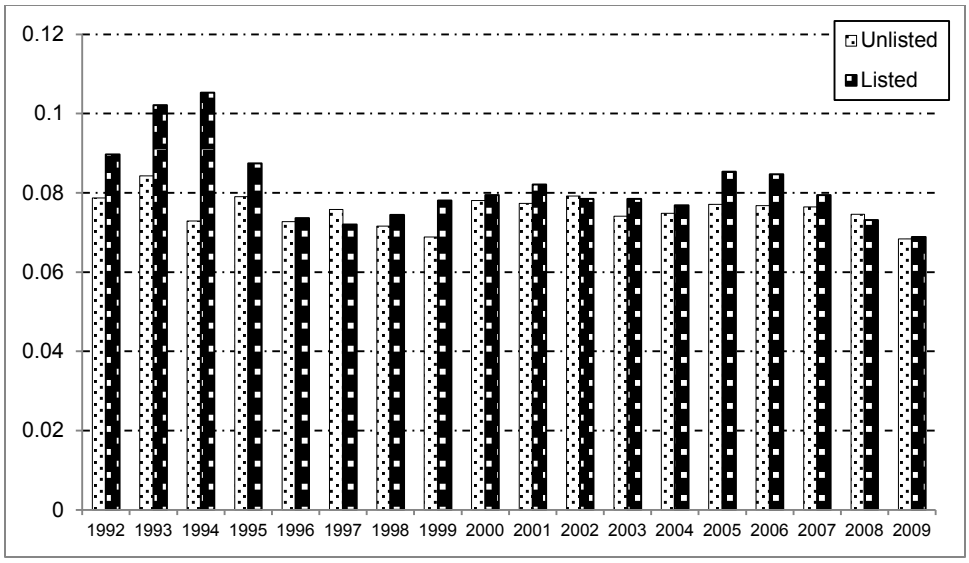

Figure 2. |ΔTLA%|. Chart displays the absolute value of the annual change in TLA (|ΔTLA%|) for listed and unlisted firms. Change in level of |ΔTLA%| for listed and unlisted firms is displayed in the right and left column, respectively.

Table 1. Leverage and other measures by industry for Indian companies in 1991-2010.

Table displays the number of observations and average total liabilities to total assets (TLA), ratio of total debt to total assets (TDA), total assets (TA, in million Rupees), ratio of net income to total assets (ROA), ratio of fixed assets to total assets (Tangibility), annual increase in total industry assets divided by total industry assets (growth), ratio of standard deviation of sales growth to average sales growth for the firm (risk). Sample includes all non-financial firms over the 1991-2010 period that are available in Prowess database. We classify industries following Fama-French 30 industry classification. All variables are winsorized by 0.5% at both ends.

Industry Level Statistics								
Industry	no. of obs.	TLA%	TDA%	TA (mil. Rs)	ROA%	Tangibility %	Growth%	Risk%
Food Products	9,437	65.34	41.94	1,090	1.00	38.81	19.30	54.11
Beer & Liquor	952	74.13	39.17	1,207	0.11	37.75	19.65	58.47
Consumer Goods	2,215	61.79	37.62	1,424	2.54	27.51	22.84	58.30
Apparel	2,330	67.62	44.71	750	0.26	36.19	19.60	54.02
Healthcare	5,098	59.94	36.53	1,646	2.34	37.31	22.61	57.96
Chemicals	7,432	65.83	40.26	1,566	1.51	37.36	14.89	55.80
Textiles	9,870	72.52	50.62	1,253	-0.31	43.19	14.71	49.68
Construction	5,689	70.80	39.09	2,970	2.11	29.65	24.34	69.95
Steel Works	7,382	71.24	44.75	1,884	1.11	33.21	20.57	61.48
Fabricated Products	9,350	65.59	34.23	1,233	1.99	27.40	20.19	60.15
Electrical Equipment	2,444	63.35	34.64	826	1.49	28.65	19.14	54.30
Autos	1,767	71.14	38.75	1,338	1.62	28.09	21.42	50.28
Aircrafts, Ships, Railroad	3,769	67.04	38.39	1,369	3.41	38.95	21.77	61.39
Mining	953	64.74	44.44	829	0.92	37.96	20.01	54.15
Utilities	3,199	65.98	39.23	3,257	2.56	33.67	24.07	58.33
Communication	1,008	68.29	39.71	6,514	-2.31	36.00	34.27	69.15
Business Services	2,653	62.58	32.97	2,438	1.85	26.16	33.29	61.50
Business Supplies	5,861	68.51	46.73	1,030	0.63	42.93	17.10	52.83
Transportation	2,048	61.99	37.29	3,448	2.59	39.91	30.32	53.37
Retail	2,886	45.26	24.29	1,572	3.28	25.31	29.06	63.88
Other	3,797	56.30	34.10	1,585	2.11	42.32	22.74	55.23
Whole Sample Statistics								
Average		65.99	40.18	1,647	1.47	35.44	20.71	57.38
Median		62.97	35.74	350	2.29	33.26	17.10	53.44
Std. Dev.		35.49	31.77	5,572	9.60	21.54	17.90	29.64

Table 2. Summary statistics and correlation matrix

TLA, TDA and CLA are the ratios of total liabilities, total debt and current liabilities to total assets, respectively. Tangibility is the ratio of fixed assets to total assets. Size is defined as the log of sales (in millions of Indian Rupees). Growth is the annual growth rate in industry assets. Profitability is the return on assets computed as the ratio of profits to total assets. Risk is computed as the ratio of the standard deviation of sales growth to the average level of sales growth (coefficient of variation of sales growth). All the reported correlation coefficients are significant at better than 1% level.

Panel A. Firm Level Summary statistics (*N*=90,140)								
	TLA	TDA	TCA	Tangibility	Size	Growth	Profitability	Risk
Average	65.99	40.18	25.81	35.44	5.85	20.71	1.47	57.38
Median	62.97	35.74	20.96	33.26	5.86	17.10	2.29	53.44
Std. Dev.	35.49	31.77	20.11	21.54	1.72	17.90	9.60	29.64
Panel B. Correlation matrix								
	TLA	TDA	TCA	Tangibility	Size	Growth	Profitability	Risk
TLA	1							
TDA	0.83	1						
TCA	0.46	-0.12	1					
Tangibility	0.10	0.30	-0.30	1				
Size	-0.07	-0.11	0.05	-0.13	1			
Growth	-0.04	-0.05	0.02	-0.08	-0.07	1		
Profitability	-0.46	-0.48	-0.05	-0.22	0.28	0.11	1	
Risk	0.00	-0.01	0.01	0.01	-0.01	0.00	-0.01	1

Table 3. Debt ratios and firm characteristics by listing status and ownership structure.

Table presents average TLA, TDA, CLA and firm level characteristics by listing status and ownership structure. Unlisted firms are more levered compared to listed firms. Firms with group-affiliated owners are more levered. Standard errors (of means) are presented in parenthesis. Pairwise t-test indicates that difference of means between unlisted and listed firms is significant at better than 1% level with exception of growth of group affiliated firms.

	Group Affiliated Firms				Stand-alone Firms		
	Unlisted	Listed	All		Unlisted	Listed	All
	(*N*=12,541)	(*N*=19,961)	(*N*=32,502)		(*N*=28,612)	(*N*=29,026)	(N=57,638)
TLA%	70.21	67.50	68.54		67.38	61.74	64.54
	(0.31)	(0.25)	(0.20)		(0.20)	(0.22)	(0.15)
TDA%	38.90	42.57	41.15		38.80	40.44	39.63
	(0.28)	(0.23)	(0.18)		(0.17)	(0.20)	(0.13)
CLA%	31.31	24.93	27.39		28.59	21.30	24.92
	(0.21)	(0.13)	(0.12)		(0.13)	(0.09)	(0.08)
Tangibility%	35.22	37.32	36.51		32.51	37.14	34.84
	(0.21)	(0.14)	(0.12)		(0.13)	(0.12)	(0.09)
Size	5.96	6.87	6.52		5.57	5.38	5.48
	(0.01)	(0.01)	(0.01)		(0.01)	(0.01)	(0.01)
Growth%	17.60	17.59	(17.59)		22.62	22.24	22.43
	(0.15)	(0.11)	(0.09)		(0.11)	(0.11)	(0.08)
ROA%	1.06	1.82	1.53		2.12	0.76	1.43
	(0.09)	(0.07)	(0.06)		(0.05)	(0.06)	(0.04)
Risk%	52.29	63.44	59.16		46.87	65.65	56.37
	(0.26)	(0.20)	(0.16)		(0.16)	(0.18)	(0.12)

Table 4. Impact of access to market and group affiliation on capital structure

We model the determinants of leverage using equation (1):

$$TLA_t = \alpha + \beta_1 Tangibility_{t-1} + \beta_2 Size_{t-1} + \beta_3 Growth_{t-1} + \beta_4 Profitability_{t-1} + \beta_5 Industry\ leverage_{t-1} + \beta_6 Risk_{t-1} + D_{Listing} + D_{Group} + \varepsilon \quad (1)$$

Leverage is the ratio of total liabilities to total assets. Tangibility is the ratio of fixed assets to total assets. Size is log of sales. Growth refers to growth in industry assets. Profitability is return on assets, the ratio of profits to total assets. Industry leverage is the average industry leverage. Listed/unlisted is a dummy variable, which equals to one when the company is listed and zero otherwise. Group dummy takes on a value of one if the firm is owned by a group Indian owner and zero otherwise. The β and the standardized β corresponding to the regression are shown in columns (1) and (2). We measure the impact of listing on the β in columns (3) and (4), by multiplying the $D_{Listing}$ variable with all the independent variables in equation (1). Similarly, we measure the impact of group in columns (5) and (6), by multiplying the D_{Group} variable with all the independent variables in equation (1). The β coefficients shown in columns (3) to (6) represent the total effect on the indicated sub-sample. The *t*-statistics are shown in parenthesis below the coefficients. The statistical significance at the 10%, 5% and 1% level is indicated by *, ** and *** respectively.

	All Firms		Unlisted	Listed	Group	Stand-alone
	(1)	(2)	(3)	(4)	(5)	(6)
	β	**Std β**	**B**	**β**	**β**	**β**
Tangibility	0.00	0.00	-0.06***	0.06***	-0.04**	0.04***
	(0.27)		(-3.85)	(3.63)	(-2.23)	(2.89)
Size	0.01***	0.06	0.00	0.02***	-0.01***	0.02***
	(7.13)		(1.02)	(8.14)	(-2.92)	(11.63)
Growth	0.08***	0.04	0.06***	0.11***	0.09***	0.07***
	(10.36)		(5.32)	(10.28)	(5.40)	(8.61)
Profitability	-1.93***	-0.51	-1.67***	-2.11**	-1.91***	-1.96***
	(-55.65)		(-32.22)	(-46.05)	(-36.17)	(-42.99)
Industry Leverage	0.51***	0.12	0.42***	0.54***	0.40***	0.55***
	(17.36)		(9.28)	(14.20)	(8.04)	(15.17)
Risk	0.08***	0.07	0.09***	0.09***	0.07***	0.09***
	(8.28)		(5.85)	(6.60)	(4.40)	(7.05)
Listed dummy	-0.06***	-0.08			-0.05***	
	(-10.87)				(-9.33)	
Group dummy	0.03***	-0.04	0.03***			
	(5.57)		(5.20)			
Constant	0.29***		0.42***	0.14**	0.46***	0.11***
	(11.84)		(11.89)	(2.54)	(12.69)	(4.14)
Observations	68,562		29,364	39,198	25,318	43,224
Adj. R-squared	0.28		0.28		0.28	

Table 5. Out of sample predictions (excluding dummies)

We estimate the coefficients for each sample of firms using:

$$TLA_t = \alpha + \beta_1 Tangibility_{t-1} + \beta_2 Size_{t-1} + \beta_3 Growth_{t-1} + \beta_4 Profitability_{t-1} + \beta_5 Industry\ leverage_{t-1} + \beta_6 Risk_{t-1} + \varepsilon$$

Leverage is the ratio of total liabilities to total assets. Tangibility is the ratio of fixed assets to total assets. Size is log of sales. Growth is growth in industry assets. Profitability is return on assets, the ratio of profits to total assets. Industry leverage is the industry mean leverage. We use the estimated coefficients based on one sub-sample to predict the leverage for firms in another out-of-sample category. In column (1), we estimate the coefficients using the sample of unlisted firms and based on the estimated model predict the leverage of listed firms. Similarly, in each column the firms in "Estimated by applying coefficients from" use the coefficients for the sub-sample of interest to predict the $\widehat{TLA}$. "Observed TLA (mean)" indicates the sub-sample average of the observed leverage in each group. "Predicted $\widehat{TLA}$ (mean)" indicates the average level of leverage predicted using the other sample, i. e. , average of $\widehat{TLA}$. "Difference" shows the difference between the predicted and the actual observed mean in the data.

	(1)	(2)	(3)	(4)	(5)	(6)
Sample of interest	Listed	Unlisted	Group	Non-group	Unlisted Group	Listed Non-group
Estimated by applying coefficients from	Unlisted	Listed	Non-group	Group	Listed Non-group	Unlisted Group
Comparing Means:						
Observed TLA (mean %)	63.58	67.40	67.27	64.01	69.16	61.70
Predicted $\widehat{TLA}$ (mean %)	68.66	61.41	66.07	68.75	62.38	70.66
Difference (observed-predicted)	-5.09	5.99	1.20	-4.74	6.78	-8.96
t-statistic	-33.94	35.23	6.47	33.36	20.29	43.95
Comparing Medians:						
Observed TLA (median %)	59.80	65.40	63.34	61.43	65.95	57.83
Predicted $\widehat{TLA}$ (median %)	67.23	60.79	64.65	67.49	60.62	68.93
Median of TLA Difference (observed-predicted %)	-6.12	5.47	-0.80	-4.41	5.29	-9.75
Sign-rank test *z*-statistic	-62.06	36.41	-6.08	-49.36	19.59	-64.66
N	39,198	29,364	25,318	43,249	9,069	22,949

Table 6. Change, absolute change, and unexpected change in TLA

We present summary statistics capturing the annual changes in leverage for listed and unlisted firms. In Panel A, the mean levels of annual change in TLA, ΔTLA%; it's absolute value, |ΔTLA%|, and the absolute value of the unexpected changes in leverage, |ε%| are presented. In order to calculate ε and |ε%|, we regress TLA on the determinants of leverage:

$\Delta TLA_t = \alpha + \beta_1 Tangibility_{t-1} + \beta_2 Size_{t-1} + \beta_3 Growth_{t-1} + \beta_4 Profitability_{t-1} + \beta_5 Industry\ Leverage_{t-1} + \beta_6 Risk + \varepsilon_t$

In the last column, we provide the difference in means and the corresponding *t*-statistics. In Panel B, we compare the variability of the ΔTLA series, and provide the F-statistics corresponding to variance ratio tests. Differences that are significant at the 1% level are bold faced.

	Unlisted firms	Listed firms	Unlisted − Listed
Panel A: Equality of Means Test			
ΔTLA%	0.05	**1.22**	**-1.17**
t-stat	(0.80)	(19.86)	(-12.58)
|ΔTLA%|	**6.81**	**7.65**	**-0.84**
t-stat	(121.40)	(157.25)	(-11.33)
|ε%|	**6.81**	**7.44**	**-0.63**
t-stat	(123.36)	(162.57)	(-8.79)
N	29,821	40,553	
Panel B: Variance Ratio Test (H_a: $\sigma_{Unlisted} < \sigma_{Listed}$), F-statistic			
$\sigma_{\Delta TLA}$	0.1184	0.1238	**0.916*****
$\sigma_{\lvert\Delta TLA\rvert}$	0.0969	0.0980	0.977**
$\sigma_{\lvert\varepsilon\rvert}$	0.1323	0.1487	**0.792*****