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Capital Structure, Group Affiliation and Financial Constraints: Indian Evidence

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This study investigates the impact of business group affiliation on firms' debt ratio in India. It also examines if group affiliation has varied impact on debts with different maturity structure (i.e. long-term debt and short-term debt), and different ownership structure (i.e. private debt and public debt). In order to draw inferences, it uses panel fixed effect regression model on a dataset of 1,510 listed firms over 2005-2013. It finds that group affiliation has negative impact on firms' long-term debt, public debt and overall debt ratio. The study further finds that cost of borrowing is not the factor behind lower debt ratios for group firms. Rather, the findings indicate that group firms are concerned for financial flexibility to avoid under investment problem in future as they have significantly higher growth opportunities than their stand-alone counterparts. Most importantly, group affiliation negatively affect debt financing only for constrained firms, but not for unconstrained firms.

Keywords: Capital Structure, Business Groups, Debt Maturity, Financial Constraints.

JEL Classification: C25, G30, G32.

Section I
Introduction

Business group form of ownership structure is common in many of world's developed and developing economies (La Porta e*t al.*, 1999; Claessens *et al.*, 2000; Masulis *et al.*, 2011). The structure of business groups can take different forms such as family control of ownership, equity cross-holdings, interlocking directorship, common bank linkage and other social non-family ties (Khanna and Rivkin, 1999; Khanna and Rivkin, 2001; Manos *et al.*, 2007). Among these,

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the pyramidal structure is the most prevalent one (La Porta *et al.*, 1999; Masulis *et al.*, 2011) where a single family has control over all the member firms irrespective of their cash flow rights in the same. This divergence between control rights and cash flow rights has witnessed a great deal of empirical research investigating its implication not only on the performance of member firms' but also their choice of capital structure (Chang and Choi, 1988; Dewenter and Warther, 1998; Khanna and Rivkin, 1999; Khanna and Palepu, 2000; Khanna and Rivkin, 2001; Ferris *et al.*, 2003; Gonenc *et al.*, 2007; Chakraborty, 2013, 2015; Bandyopadhyay and Barua, 2016).

The vast pool of existing literature recognises both bright and dark sides of group affiliation which seem to have implications on firms' capital structure choices. The bright side of group affiliation includes lower agency conflicts (Anderson *et al.*, 2003), lesser information asymmetry (Dewenter and Warther, 1998), access to internal capital market (Chang and Choi, 1998; Gonenc *et al,* 2007; Fier *et al*, 2013) and better access to external capital market due to better reputation (Dewenter and Warther, 1998) and co-insurance (guarantee) by other group members (Khanna and Palepu, 2000; Ferris *et al.*, 2003; Gopalan *et al.*, 2007). On the contrary, group affiliation is criticised on the ground of potential expropriation of minority shareholders by controlling shareholders in the form of tunneling of resources from bottom to top of the pyramid (Bertrand *et al.*, 2002; Bae *et al.*, 2002). Moreover, group affiliation creates a non-diversifiable risk of debt for the controlling shareholders (Rajan and Zingales, 1995; Friend and Lang, 1988). To the extent, these considerations affect the costs of debt, the capital structure of group affiliated firms expected to be different from the comparable stand-alone firms.

Prior studies examining the impact of group affiliation on capital structure document mixed results. Ferris et al. (2003), Manos et al. (2007), Dewaelheyns and Hulle (2012) and Chakraborty (2015) find a positive relationship between leverage and group affiliation, whereas Chakraborty (2013) finds a negative relationship between the two for Indian firms. This inconsistency in existing literature demands further research to better understand the relationship between the two. Further, does the impact of group affiliation vary for debts with different maturity structure i.e. long-term debt (LTD) versus short-term debt (STD) and for debts with different ownership structure i.e. private debt (PVTD) versus public debt (PBLD), is yet to explore[1]. Moreover, the existing literature lacks any study examining if the impact of group affiliation is similar for both financially constrained and unconstrained firms. With this backdrop, the present study empirically examines three important research questions. First, how does firms' business group affiliation affect overall (total) debt (TD) level and how is it different for constrained and unconstrained firms? Secondly, how does firms' business group affiliation affect debts with different maturity

1. The study defines PVTD as debt from bank and other non-bank financial institutions and all other debts as PBLD.

structures i.e. LTD versus STD and how is it different for constrained and unconstrained firms? Thirdly, how does firms' business group affiliation affect debts with different ownership structure i.e. PVTD *versus* PBLD and how is it different for constrained and unconstrained firms?

The findings of the study show negative impact of group affiliation on firms' overall debt ratio. The segregation of total debt on the basis of maturity and ownership structure reveals that the negative impact of group affiliation is significant only for long-term debt and public debt, but not for short-term debt and private debt. However, group firms are found to have significantly lower level of interest expenses than stand-alone firms. This discards the possibility of higher costs of borrowing being the factor behind lower debt ratio for group firms. Further analysis reveals that group firms have significantly higher growth opportunities than their stand-alone counterpart and they raise additional debts at a lower rate than stand-alone firms with the increase in growth opportunities. Therefore, the intention to maintain financial flexibility and to avoid underinvestment problem in future may be the possible reason of lower debt ratio for group firms. Finally, group affiliation is found to be an important consideration in capital structure decision only for financially constrained firms, but not for unconstrained firms.

The rest of the paper takes the following order. Section II provides an extensive literature review, Section III outlines the empirical framework followed by Section IV which provides data description and descriptive statistics. Section V contains empirical analysis and finally Section VI concludes the paper.

Section II
Literature Review

Financial Distress, Bankruptcy Risk and Group Affiliation

Financial distress and bankruptcy risk is one of the significant factors that determines firms' level of debt. The whole debate on capital structure started after the irrelevance proposition of Modigliani and Miller (1958). Subsequent works have examined the issue further and unearthed the tax benefit of debt (Modigliani and Miller, 1963). Although increasing the usage of debt provides tax benefits, it also increases the financial distress and bankruptcy risk (Karus and Litzenberger, 1973), which means that firms should maintain a trade-off between the two. Raising debts beyond the trade-off point makes the external financing costly and inaccessible because of higher financial distress and bankruptcy risk. In the light of financial distress and bankruptcy argument, group affiliation seems to have several implications on debt financing decision of member firms. Group firms get support from other member firms at the time of financial distress and bankruptcy. The intra-group guarantee and co-insurance effect of group affiliation make external debt less costly and easily accessible (Gopalan *et al.*, 2007; Byun *et al.*, 2013).

Moreover, group affiliation provides the benefit of the internal capital market when the external capital market is costly, which is not available for stand-alone firms (Chang and Choi, 1998; Gonenc *et al.*, 2007; Fier *et al.*, 2013). Finally, the reputational benefits of group firms make the legal resolution of contractual disputes less costly, especially in emerging economies where the legal system is not developed like the other poised economies (Ghemawat and Khanna, 1998). These arguments suggest positive impact of group affiliation on firms' level of debt. On the contrary, the policy distortion arguments of Ghemawat and Khanna (1998) indicates that group firms can create non-debt tax shields (NDTS) which can substitute the tax benefits of debt. They can use their political contracts and lobbying power in order to reduce tax liability. Further, they can diversify into businesses where the tax rate is low and can cross-subsidize each other with the help of intra-group transactions. Ferris et al. (2003) find evidence in support of cross-subsidization among the member firms. These can lead to lower debt financing for group firms than stand-alone firms.

Information Asymmetry and Group Affiliation

Another important aspect in capital structure theories is information asymmetry between insiders and outsiders. The pecking order theory suggests that due to information asymmetry outsiders perceive firms' new issue announcements negatively which adversely affects the price of securities in the market (Myers, 1984; Myers and Majluf, 1984). In order to avoid this adverse selection costs, firms choose a hierarchy in their financing choice. They first use internal funds to meet their financing requirements and when internal funds are not sufficient, they first use safest security which is least affected by information asymmetry i.e. debt and only as a last option use equity. Firms' group affiliation can have several possible implications in this regard. The level of information asymmetry is lower for group affiliated firms than the stand-alone firms due to close ties between managers and investors (Dewenter and Warther, 1998).

Lesser information asymmetry together with group level diversification and intra-group guarantees are expected to provide group firms better access in external capital market than the comparable stand-alone firms (Ghemawat and Khanna, 1998; Khanna and Palepu, 2000; Lensink *et al.*, 2003), which in turn may distort group firms' hierarchy in financing choice[2]. Further, they also have access to internal capital market (Chang and Choi, 1998; Gonenc *et al.*, 2007; Fier *et al.*, 2013) which substitutes the external capital market in the presence of higher information asymmetry. Based on these arguments one can predict a positive impact of group affiliation on firms' debt ratio.

2. For example, group firms, with better access in external capital market, may choose to raise funds through debts and with lesser information asymmetry, they may return the retained earnings to shareholders in the form of dividend or repurchasing equity without incurring much information costs, thus maintaining a healthy leverage ratio which will ultimately increase the return on equity and the market value of firm.

Agency Conflicts and Group Affiliation

The final important driver of capital structure theories is agency conflicts among different stakeholders. The owner-manager conflicts (Jensen and Meckling, 1976) is a conflict where managers do not act in the best interest of the owners. In such circumstances, debt is used as an instrument to mitigate this agency problem {see Harris and Raviv, (1991) for review}. Debt makes managers disciplined because it imposes restrictive covenants and failure to service debt gives creditors option to take the firm into liquidation (Harris and Raviv, 1990). Moreover, because interest on the debt is a fixed commitment, it reduces the free cash available to the managers and thereby reduces their discretion (Jensen, 1986). Nevertheless, increasing the level of debt leads to another agency conflict i.e. the conflict between owner and debtholders which can take the form of assets substitution (Jensen and Meckling, 1976) and underinvestment problem (Myers, 1977). Further, complex covenants deter the valuable operational flexibility of managements (Easterwood and Kadapakkam, 1994).

Group affiliation can play an important role in the above-mentioned agency framework. First, in a pyramidal structure, groups are usually controlled by a single family and the top management is generally from relatives and descendants of the family (La Porta *et al.*, 1999; Claessens, *et al.*, 2000; Masulis *et al.*, 2011). Because of the presence of large shareholders on the board and the blending of management's interest with the owners' interest, the owner-manager conflict is substantially reduced in this framework (Jensen and Meckling, 1976; Rajan and Zingales, 1995). This argument suggests that group affiliation is expected to reduce member firms' incentive to use debt in capital structure in mitigating owner-manager agency conflicts. Secondly, group firms exhibit lower agency conflicts between shareholders and debtholders. This is because of managers' close ties with the investors (Dwenter and Warther, 1998) and complex interaction of monitoring and control by other stakeholders (Prowse, 1992).

Further, the agency conflicts between bondholders and founding family firms are lesser also because of the incentive structure of the latter to maximise firm value (Anderson *et al.*, 2003). These arguments suggest higher level of debt for group firms than the stand-alone firms. Finally, group structure has a different type of agency conflict i.e. the conflict between controlling and minority shareholders where the former expropriates the latter by means of tunneling of resources from firms with low cash flow rights to firms with high cash flow rights (Bertrand *et al.*, 2002; Bae *et al.*, 2002). Potential tunneling and other moral hazard activities by the controlling shareholders makes group firms financially constrained and increases their costs of debt due to higher monitoring costs and credit risk faced by the lenders (Lin *et al.*, 2011a; Lin *et al.*, 2011b). These arguments suggest a negative impact of group affiliation on the debt ratio. Therefore, the expected impact of group affiliation on firms' level of debt is not straightforward.

Section III
Empirical Framework

The study uses panel data fixed effect (FE) regression model with some of the common determinants of the capital structure identified in the prior studies (Shyamsunder and Myers, 1999, Fama and French, 2002; Flannery and Rangan, 2006 and Byoun, 2008). The advantages of panel data models lie in more information, more variability, less collinearity, more degrees of freedom and more efficiency (Gujarati *et al.*, 2012, pp 623). Further, the panel data models allow accounting for the impact of cross-sectional heterogeneity on the dependent variable. Specifically, the study uses the following regression model:

$$DR_{it} = \beta\,(GD_{it}) + \lambda\,(CV_{it}) + \alpha_i + \upsilon_t + \varepsilon_{it} \qquad (1)$$

Where, the subscript i = 1, 2, 3, ..., 1510 denotes the number of firms in our sample and the subscript t = 1, 2, 3, ..., 9 denotes the number of years. DR represents the dependent variable, i.e. firms' debt ratio which is either the total debt (TD), long-term debt (LTD), short-term debt (STD), private debt (PVTD) or public debt (PBLD), each scaled by the amount of capital employed[3].

GD is the group affiliation dummy which takes the value 1 if the firm is a group firm and 0 otherwise, and β is the coefficient of GD. CV is the set of conventional capital structure determinants which includes *size, tangibility, profitability, non-debt tax shield, market to book ratio and uniqueness*, and λ captures the coefficients of these variables (Table 1 provides the details of conventional capital structure determinants). α_i and υ_t account for the unobserved firm specific and year specific fixed effects respectively. Finally, ε_{it} is the independently and identically distributed error time with zero mean and constant variance. The study uses Hausman Test to choose between the random effect (RE) and FE models. The standard errors are adjusted for heteroskedasticity using the procedure of White (1980).

Section IV
Data Description and Descriptive Statistics

The initial sample consists of all listed Indian firms available in 'Capitaline Plus' database over the period of 2005-2013[4]. The study excludes firms for which data is not available for the entire study period[5]. Following prior studies,

3. In order to examine if the impact of group affiliation on debt ratio varies on the basis of maturity and ownership structure of debt, the study segregates TD on the basis of maturity structure i.e. LTD and STD and on the basis of ownership structure i.e. PVTD and PBLD and use them as dependent variables in the model.
4. The study period is decided based on the availability of data for required variables for maximum number of firms over a reasonable length of period.
5. This leads to exclusion of 27.83% of the initial sample.

Table 1
Description of Variables

This table provides the description of conventional capital structure determinants with theoretical arguments:

Variables	*Definition*	*Reasoning*	*Expected Impact*
Firm size: SIZE	Natural logarithm of Total Assets	Large firms are generally financially stable, more diversified and enjoy better of Total Assets reputation which allow them to have better access in the financial market with lower costs of borrowings. Therefore, trade-off theory predicts positive impact of firm size on leverage. On the contrary, pecking order theory predicts negative impact as large firms, due to their stringent disclosure requirements, have lesser information asymmetry and adverse selection problem in issuing equity. Moreover, they are mostly mature firms with lower growth rate and higher profitability which allows them to use retained earnings to meet their financing requirements.	+/-
Tangibility of assets: TANG	Property, Plant and Equipment/ Total Assets	Firms with higher level of tangible assets can use the same as collateral while raising funds through debts. Moreover, higher the proportion of tangible assets, higher is the security for creditors in case of default. Therefore, trade-off theory predicts positive impact of tangibility on the leverage ratio. On the contrary, higher proportion of tangible assets also denotes lesser information asymmetry and adverse selection problems. Therefore, one can predict negative impact of tangibility on firms' leverage as per the arguments of pecking order theory.	+/-
Profitability of firm: PROF	EBIT/Total Assets	Firms with higher profitability have better ability to service debt and are therefore, lesser prone to financial distress and bankruptcy. Moreover, the tax incentive of using debt is more for them. Therefore, trade-off theory predicts positive relationship between profitability and leverage. On the contrary, higher profitability means higher level of internally generated funds to meet the financing requirements. Therefore, the pecking order theory predicts negative relationship between profitability and level of debt.	+/-
Non-debt tax shield: NDTS	Depreciation/ Net Sales	Trade-off theory predicts negative impact of NDTS (like tax benefits from depreciation and amortization expenses) on firms' leverage level. This is because NDTS works as a substitute of debt in reducing tax liability without issues such as financial distress and bankruptcy risks, agency conflicts etc.	-

Table 1 *(Contd.)*
Description of Variables

This table provides the description of conventional capital structure determinants with theoretical arguments:

Variables	*Definition*	*Reasoning*	*Expected Impact*
Market to book ratio: MB	Market value of assets/Book value of assets	As per market timing arguments, firms should issue equity when MB is high and should repurchase equity when MB is low. Moreover, higher MB also indicates higher growth opportunities which means higher agency costs of debt. Therefore, MB is expected to have adverse impact on firms' debt ratio as per market timing theory and agency theory respectively. On the contrary, higher growth opportunities add value to firms which ultimately increases their debt financing capacity. Moreover, firms with higher growth firms are expected to use more debt (after retained earnings) to meet their financing requirements, especially when equity market involves higher transaction and information costs. These arguments suggest positive impact of MB on firms' debt ratio.	+/-
Uniqueness: UNIQ	Selling Expenses/ Net Sales	Firms dealing with unique and specialised products require specialised labor and equipment to carry out their operation. The labors used by these firms do not find a favourable labor market in the event of bankruptcy and liquidation. Similarly, the equipment used by them do not find a readily available resell market which reduces their collateral value. Therefore, these firms are expected to use lesser debt ex-ante to avoid higher costs of liquidation ex-post.	-

it also excludes financial and utility firms (Rajan and Zingles, 1995; Ozkan, 2001), firms with non-positive total assets and net sales (Byoun, 2008) and firms with missing data of required variables (Ozkan, 2001; Shyamsunder and Myers, 1999)[6]. The final dataset includes 13590 firm-year observations with a balanced panel of 1,510 firms over the period of nine years. Following prior studies (Chakraborty, 2013, 2015), a firm is defined as a group affiliated firm if the share of promoters' equity holding is at least 51 per cent. Accordingly, 7,431 firm-year observations are grouped as group firms and 6,159 firm-year observations are grouped as stand-alone firms.

Table 2
Descriptive Statistics

This table reports the descriptive statistics of dependent and independent variables with tests for differences in their mean and median values between group and stand-alone firms:

	All Firms			*Group Firms*			*Stand-alone Firms*				*Rank-Sum*
Variables	*Mean*	*Med.*	*SD*	*Mean*	*Med.*	*SD*	*Mean*	*Med.*	*SD*	*T-test*	*Test*
Total Debt	0.41	0.39	0.37	0.40	0.40	0.35	0.41	0.38	0.39	-0.01 (-1.33)	0.02 (2.01)**
Long-Term Debt	0.20	0.13	0.24	0.20	0.13	0.23	0.21	0.14	0.26	-0.02 (-3.96)*	-0.01 (-2.97)**
Short-Term Debt	0.21	0.16	0.21	0.21	0.17	0.21	0.20	0.15	0.22	0.01 (3.38)*	0.02 (4.66)*
Private Debt	0.13	0.05	0.18	0.13	0.05	0.18	0.14	0.05	0.19	-0.01 (-1.87)***	-0.01 (-1.69)***
Public Debt	0.28	0.23	0.29	0.28	0.24	0.27	0.28	0.22	0.30	0.00 (0.19)	0.02 (2.82)*
Size	4.97	4.88	1.93	5.09	4.99	1.82	4.82	4.65	2.04	0.28 (8.35)*	0.34 (9.03)*
Tangibility	0.32	0.30	0.21	0.33	0.31	0.20	0.31	0.28	0.21	0.02 (5.03)*	0.02 (5.31)*
Profitability	0.09	0.08	0.09	0.10	0.09	0.09	0.08	0.08	0.09	0.01 (8.86)*	0.01 (10.32)*
Non-Debt Tax Shield	0.05	0.03	0.07	0.05	0.03	0.07	0.06	0.04	0.08	-0.01 (-5.24)*	-0.01 (3.45)*
Market to Book Ratio	1.33	1.00	1.09	1.38	1.03	1.13	1.26	0.97	1.04	0.12 (6.37)*	0.06 (8.76)*
Uniqueness	5.84	2.04	16.45	5.73	1.99	16.56	5.98	2.12	16.32	-0.26 (-0.90)	-0.12 (-3.87)*

Note: *(a)* Figures in parentheses are t-statistics for T-test and z-statistics for Rank Sum Test; *(b)* *, ** and *** denote coefficients are significant at 1, 5 and 10 per cent level respectively.

6. The initial sample includes 21.82 per cent financial firms, 0.34 per cent utility firms, 7.67 per cent firms with non-positive total assets and net sales and 13.59 per cent firms with missing data.

Table 2 reports the descriptive statistics which includes mean, median and standard deviation values for dependent and independent variables. It also reports the results of T-Test and rank-Sum Test which examine if the mean and median values of variables are different for group and stand-alone firms[7]. Following prior studies like Flannery and Rangan (2006) and Byoun (2008), all the continuous variables are winsorised at the 1st and 99th percentiles to avoid the influence of extreme observations. The statistics in Table 2 shows that the mean values of TD are not different for group and stand-alone firms; however, the median value is significantly higher for the former than the latter. The division of debt on the basis of their maturity structure reveals that the level of LTD is significantly lower whereas the level of STD is significantly higher for group firms than the standalone firms. Further, the separation of private and public debts reveal that group firms use lesser level of debt from private sources and higher level of debt from public sources in comparison to stand-alone firms. With regard to firm characteristics, the table reveals that the group firms are significantly larger in size, have higher level of tangible assets, profitability and market-to book ratio and lower level of NDTS and uniqueness than stand-alone firms.

Table 3
Correlation Matrix

This table reports the correlation matrix for dependent and independent variables with values of variance inflation factor:

Variables	*TD*	*LTD*	*STD*	*PVTD*	*PBLD*	*SIZE*	*TANG*	*PROF*	*NDTS*	*MB*	*UNIQ*	*VIF*
TD	1											-
LTD	0.79*	1										-
STD	0.72*	0.20*	1									-
PVTD	0.56*	0.72*	0.19*	1								-
PBLD	0.86*	0.52*	0.79*	0.11*	1							-
SIZE	0.04*	0.11*	0.01	0.24*	-0.06*	1						1.16
TANG	0.26*	0.35*	0.04*	0.35*	0.10*	-0.02**	1					1.20
PROF	-0.23*	-0.18*	-0.17*	-0.10*	-0.22*	0.20*	-0.05*	1				1.17
NDTS	0.06*	0.16*	-0.10*	0.13*	-0.02**	-0.05*	0.33*	-0.15*	1			1.25
MB	0.05*	0.08*	-0.03*	0.01	0.05*	0.22*	-0.08*	0.31*	-0.02**	1		1.19
UNIQ	-0.14*	-0.09*	-0.16*	-0.10*	-0.12*	-0.18*	-0.14*	-0.09*	0.22*	0.05*	1	1.16

Note: *, ** and *** denote results are significant at 1, 5 and 10 per cent level respectively.

Table 3 reports the correlation matrix of dependent and independent variables. It shows that PVTD has very high correlation with LTD and very low correlation

7. Emphasis is given on Multivariate Analysis while making inferences as results of Univariate Analysis are only indicative, not conclusive.

with STD. On the contrary, PBLD has comparatively higher correlation with STD than the LTD. These results suggest that firms taking debt from private sources generally prefer debt with longer maturities and firms taking debt from public sources generally prefer debt with shorter maturities. With regard to the independent variables, the results indicate that multicollinearity is not a serious issue as correlation coefficients lies between -0.18 (SIZE and UNIQ) to 0.33 (TANG and NDTS). Moreover, the study also checks the VIF which is much lesser than 10 for all the variables, beyond which the multicollinearity poses a serious threat to the results (Gujarati *et al.*, 2012, pp. 359).

Section V
Empirical Analysis

Whole Sample

Table 4 reports the result of FE regression model. The table also reports two Wald tests showing the joint significance of all explanatory variables and year dummies respectively. The results show that the major variable of interest in the study i.e. the GD is negatively related to TD which means that the overall level of debt for group and stand-alone firms are not same and other things remaining constant, the former has 3 per cent lower TD than the latter. The division of TD on the basis of maturity structure shows that group affiliation has significant negative impact on the level of LTD whereas, it does not have any impact on the level of STD. Similarly, the segregation of TD on the basis of ownership structure reveals that group firms maintain significant lower level of PBLD whereas, their quantum of PVTD is not different from their stand-alone counterparts. In Indian context, these results contradict the findings of Manos *et al*. (2007) and Chakraborty (2015) but similar to the findings of Chakraborty (2013). Therefore, a section of literature discussed above, which argues that group firms maintain higher level of debts due to lesser bankruptcy and financial distress risk, lower information asymmetry and agency conflicts, is found to be rejected for Indian firms.

Table 4
FE Regression (Whole Sample)

This table reports the results of fixed effect regression model for the whole sample:

Variables	*Total Debt*	*Long-Term Debt*	*Short-Term Debt*	*Private Debt*	*Public Debt*
Constant	0.05	-0.08	0.12	-0.13	0.20
	(1.00)	(-2.19)**	(3.17)*	(-5.60)*	(4.80)*
Group	-0.03	-0.01	-0.01	-0.01	-0.03
Dummy	(-2.11)**	(-1.81)***	(-1.12)	(-0.08)	(-2.20)**
Size	0.07	0.05	0.02	0.05	0.01
	(6.56)*	(7.25)*	(3.04)*	(11.18)*	(1.75)***
Tangibility	0.20	0.22	-0.03	0.16	0.03
	(4.74)*	(7.44)*	(-0.99)	(7.13)*	(0.91)
Profitability	-0.61	-0.33	-0.26	-0.17	-0.44
	(-9.76)*	(-8.46)*	(-7.59)*	(-7.19)*	(-8.42)*
Non-Debt	0.40	0.13	0.23	0.09	0.30
Tax Shield	(3.96)*	(1.97)**	(3.06)*	(2.05)**	(3.45)*
Market to	0.06	0.03	0.02	0.01	0.04
Book Ratio	(6.85)*	(6.40)*	(4.57)*	(4.48)*	(6.18)*
Uniqueness	-0.001	-0.001	-0.001	-0.0001	-0.001
	(-4.57)*	(-3.02)*	(-3.25)*	(-0.98)	(-5.06)*
Adjusted R2	0.75	0.67	0.65	0.61	0.69
Wald Test (1)	18.18*	31.95*	26.29*	29.82*	18.86*
Wald Test (2)	11.10*	42.05*	33.70*	44.80*	16.14*
Hausman Test	584.56*	295.77*	326.61*	245.82*	267.74*

Note: *(a)* Figures against variables are the coefficients and t-statistics (in parentheses); *(b)* Figures against Wald Test and Hausman Test are the F-statistics and chi-square statistics respectively; *(c)* *, * and *** denote coefficients are significant at 1, 5 and 10 per cent level respectively; *(d)* The null hypotheses for Wald Test (1) and Wald Test (2) respectively are that the explanatory variables and year dummies are jointly insignificant, and *(e)* The null hypothesis for Hausman Test is that the FE and RE estimators do not differ substantially i.e. the unobserved firm specific heterogeneities are not correlated with the explanatory variables.

Table 5
Interest Costs (Whole Sample)

This table reports the comparison of interest costs between group and stand-alone firms for the whole sample:

	All Firms		*Group Firms*		*Stand-Alone Firms*			*Rank-Sum*
Variable	*Mean*	*Median*	*Mean*	*Median*	*Mean*	*Median*	*T-Test*	*Test*
Interest	0.06	0.03	0.05	0.03	0.06	0.04	-0.01 (-2.17)**	-0.01 (-5.38)*

Note: *(a)* Figures in parentheses are t-statistics for T-Test and z-statistics for Rank-Sum Test;
(b) * and ** denote coefficients are significant at 1 and 5 per cent level respectively.

The lower level of debt for group firms may indicate their higher costs of debt in comparison to stand-alone counterparts due to potential tunneling and other moral hazard activities by the controlling shareholders (Lin *et al.*, 2011a; Lin *et al.*, 2011b). In order to examine the same, the study compares the mean and median interest expenses (scaled by total expenses) between the two groups of firms. The results, as given in Table 5, shows that the interest cost of group firms is significantly lower than the stand-alone firms. This result rejects the argument that group firms have higher costs of debt due to tunneling of resources and other moral hazard activities by the controlling shareholders. The other possible reasons for negative impact of group affiliation on the debt level can be: firstl in case of group firms, high debt may impose a non-diversifiable risk on the controlling family than to minority shareholders in the event of bankruptcy which may ultimately provide them incentives to maintain lower debt ratio than their stand-alone counterparts (Rajan and Zingales, 1995; Friend and Lang, 1988).

Secondly, group firms can use political contacts, lobbying power and intra-group transactions to cross-subsidize each other as an alternative of debt to reduce tax liability (Ghemawat and Khanna, 1998; Ferris *et al.*, 2003). Finally, lesser debt for group firms can be due to their inherent characteristics such as larger size, higher tangibility, higher profitability and better growth opportunities (as indicated by the higher MB ratio) than their stand-alone counterparts. These characteristics may provide incentives to rely more on retained earnings and equity financing than debt. Sub-section 5.2 provides further insight on this issue.

All the conventional determinants of capital structure are significant with predicted signs except for NDTS. SIZE is positively related to leverage ratios and is statistically significant in all cases. The positive coefficients of SIZE suggest that larger firms are generally more diversified, have lower information asymmetry, lower bankruptcy risk and hence prefer more debt than smaller firms.

The positive coefficient of TANG suggests lower costs of debt with the availability of more collateral to pledge. However, the coefficients are statistically significant only for LTD and PVTD which signifies that collateral is an important factor for taking long-term debts and debts from private sources like banks but not for taking short-term debts and debts from public sources. The significant negative coefficient of PROF confirms the pecking order argument that firms with higher internal funds prefer less external debt (Myers and Majluf, 1984). However, the positive relationship of NDTS with leverage ratio is in contrast to the trade-off argument that debt and non-debt tax shield substitute each other (DeAngelo and Masulis, 1980). This result is similar to the findings of Chakraborty (2013) for Indian firms.

The M/B ratio is positively related to different debt ratios which is against the argument that firms with favourable growth opportunities ex-ante preserve debt capacity to avoid ex-post underinvestment problem (Myers, 1977; DeAngelo and DeAngelo, 2007). However, positive coefficient of M/B ratio implies that higher growth opportunities add value to firms which in turn increases their debt financing capacity (Titman and Wessels, 1988; Banerjee *et al.*, 2000). It may also be argued that with higher growth opportunities, firms retain more earnings for investment and hence use more debt to maintain target debt ratio (Chang and Rhee, 1990). Bhaduri (2010) and Chakraborty (2010) further argued that growing firms use more debt to meet their financing requirements, especially where information costs are higher related to equity issues. Therefore, agency argument on impact of growth opportunities on firms' debt financing is not applicable for Indian firms. Finally, UNIQ is negatively significant in all the cases but the impact is very marginal. The negative coefficient of UNIQ confirms Titman and Wessels (1988) argument that firms dealing with unique and specialised products maintain ex-ante lower leverage to avoid the ex-post higher cost of liquidation.

Group Affiliations and Impact of Conventional Capital Structure Determinants

Table 2 shows that the characteristics of group and stand-alone firms are not same. In general, group firms are larger in size and more profitable, have higher level of tangible assets and better growth opportunities in comparison to their stand-alone counterparts. Larger size and higher tangibility may facilitate group firms to issue more equity capital by reducing asymmetric information. The higher level of profitability, as the pecking order theory argues, may reduce group firms' reliance on external debt. Similarly, the higher level of growth opportunities may induce group firms to maintain ex-ante financial flexibility to avoid ex-post underinvestment problem. Therefore, keeping above arguments in view, in order to examine if lower level of debt for group firms is the outcome of differences in firm characteristics, the study incorporates interactions of GD and conventional capital structure determinants in model (1) and extends the same as follows:

$$DR_{it} = \beta\ (GD_{it}) + \lambda(CV_{it}) + \delta\ (GD*CV_{it}) + \alpha_i + \nu_t + \alpha_{it} \quad (2)$$

Where, GD*CV is the interaction of GD and conventional capital structure determinants and δ captures the coefficients of these interaction terms[8].

The problem with model (2) is that the GD, CVs and interactions of GD and CVs are used simultaneously on the same model which may pose serious multicollinearity issues. In order to examine the same, the study checks the correlations among independent variables and their VIF values. Table 6 reports the VIF values of independent variables with and without GD in the model. As the table shows, the presence of GD in the model creates serious multicollinearity issues as VIF values for GD and GD*SIZE are higher than 10 (Gujarati *et al.*, 2012, pp. 359). However, on exclusion of GD from the model, the maximum VIF value comes down to 4.97 i.e. in case of GD*SIZE. Therefore, the GD is dropped and the final interactive model is set as below:

$$DR_{it} = \lambda(CV_{it}) + \delta\ (GD*CV_{it}) + \alpha_i + \nu_t + \varepsilon_{it} \quad (3)$$

Table 6
Variance Inflation Factor (VIF)

This table reports the VIF values for independent variables from Model 2 (with Group Dummy) and Model 3 (without Group Dummy):

Variables	*With Group Dummy*	*Without Group Dummy*
Group Dummy	12.13	–
Size	2.19	1.73
Tangibility	2.62	2.38
Profitability	2.61	2.60
Non-Debt Tax Shield	2.34	2.34
Market to Book Ratio	2.77	2.71
Uniqueness	2.67	2.59
GD*Size	10.91	4.97
GD* Tangibility	5.71	4.47
GD* Profitability	3.88	3.81
GD* Non-Debt Tax Shield	2.96	2.96
GD* Market to Book Ratio	4.71	4.59
GD* Uniqueness	2.77	2.56
Year 06	1.79	1.79
Year 07	1.79	1.79
Year 08	1.79	1.79
Year 09	1.81	1.81
Year 10	1.80	1.80
Year 11	1.81	1.81
Year 12	1.82	1.82
Year 13	1.83	1.83

Note: (a) GD stands for Group Dummy, and *(b)* Year 06 to Year 13 are year dummies for 2006 to 2013. 2005 is taken as the base year.

8. The other notations of model (2) is similar to model (1) and therefore, not discussed again.

The results of Model 3 are reported in Table 7. Coefficients of CVs without GD interactions in the table are showing the impact of CVs on debt ratios for stand-alone firms whereas, coefficients of CVs with GD interactions are showing how the impact of CVs on debt ratios vary (differential impact) if the firms are affiliated to business groups. Apart from coefficients, the table also reports results of three Wald tests which are showing the joint significance of all explanatory variables, interaction terms and year dummies respectively. The table shows that the coefficients of CVs without GD interactions are similar to the results reported in Table 4, i.e. results obtained from Model 1. These results confirm the positive impact of size, tangibility, non-debt tax shield and market to book ratio; and negative impact of profitability and uniqueness on firms' debt ratios.

Coefficients of CVs with GD interactions provide some interesting interpretations. GD*SIZE is significantly positive in all cases except for private debt. This implies that group firms' dependence on debt increases more than stand-alone firms with the increase in size. Possibly, lesser financial distress and bankruptcy risks and other benefits of group affiliation allow large group firms to use debt more aggressively than their stand-alone counterparts, thus retaining control over the business. The coefficient of GD*TANG is negatively significant in case of TD, STD and PBLD which imply that, with the increase in tangibility, increase in short-term debt and public debt is comparatively lesser for group firms than stand-alone firms. Possible explanation for these findings is that capital structure of group firms is less sensitive to tangibility than stand-alone firms as they have some unique benefits to support higher debt. The interactions of GD with PROF and NDTS are not significant which mean that the impact of profitability and NDTS is not different for group and stand-alone firms. The coefficient of GD*MB is negatively significant for TD, LTD and PBLD but not for STD and PVTD.

These results suggest that group firms increase their long-term debt and public debt lesser than stand-alone firms with the increase in growth opportunities possibly to avoid underinvestment problem in future. Therefore, taking a clue from Table 2, we can argue that lower debt ratio for group firms is their concern for financial flexibility to capitalise future growth opportunities. Finally, GD*UNIQ is positively significant for LTD and PVTD. These results imply that long-term debt and private debt of group firms are less sensitive to uniqueness than the stand-alone firms. The plausible explanation in this context is that group firms are less concerned about financial distress and bankruptcy risk due to intra-group guarantee and co-insurance by member firms.

Table 7
FE Regression with GD Interactions (Whole Sample)

This table reports the results of fixed effect regression model with interactions of GD and conventional capital structure determinants for the whole sample:

Variables	*Total Debt*	*Long-term Debt*	*Short-Term Debt*	*Private Debt*	*Public Debt*
Constant	0.02	-0.09	0.01	-0.14	0.18
	(0.46)	(-2.70)*	(3.76)*	(-5.94)*	(4.33)*
Size	0.06	0.05	0.02	0.05	0.01
	(5.98)*	(6.97)*	(2.77)*	(11.14)*	(1.27)
Tangibility	0.27	0.23	0.01	0.16	0.08
	(5.07)*	(6.37)*	(0.29)	(6.04)*	(2.08)**
Profitability	-0.58	-0.29	-0.27	-0.16	-0.43
	(-6.60)*	(-5.42)*	(-5.42)*	(-3.95)*	(-6.04)*
Non-Debt	0.37	0.11	0.20	0.06	0.29
Tax Shield	(3.29)*	(1.39)	(2.05)**	(1.15)	(2.94)*
Market to	0.08	0.04	0.02	0.02	0.06
Book Ratio	(5.67)*	(5.02)*	(3.59)*	(3.59)*	(5.27)*
Uniqueness	-0.002	-0.001	-0.001	-0.001	-0.001
	(-3.83)*	(-3.26)*	(-1.99)**	(-3.35)*	(-3.42)*
GD*Size	0.01	0.01	0.01	0.002	0.01
	(2.78)*	(1.88)***	(1.78)***	(0.87)	(2.59)**
GD*	-0.13	-0.04	-0.07	-0.02	-0.10
Tangibility	(-2.08)**	(-0.93)	(-2.12)**	(-0.53)	(-2.01)**
GD*	-0.06	-0.07	0.001	-0.03	-0.02
Profitability	(-0.54)	(-0.97)	(0.04)	(-0.60)	(-0.18)
GD* Non-Debt	0.08	0.06	0.07	0.06	0.05
Tax Shield	(0.56)	(0.55)	(0.65)	(0.84)	(0.39)
GD* Market to	-0.04	-0.02	-0.01	-0.01	-0.03
Book Ratio	(-2.65)*	(-2.50)**	(-0.88)	(-1.56)	(-2.60)*
GD* Uniqueness	0.0004	0.001	-0.0003	0.001	-0.0002
	(0.76)	(1.95)***	(-0.72)	(3.47)**	(-0.52)
Adjusted R2	0.76	0.67	0.65	0.61	0.69
Wald Test (1)	14.14*	25.99*	19.98*	23.94*	14.51*
Wald Test (2)	2.12**	2.26**	1.00	3.11*	1.99***
Wald Test (3)	11.30*	42.39*	38.08*	44.94*	15.76*
Hausman Test	654.01*	310.49*	328.58*	254.90*	270.50*

Note: (a) GD stands for Group Dummy; *(b)* Figures against variables are the coefficients and t-statistics (in parentheses); *(c)* Figures against Wald Test and Hausman Test are the F-statistics and chi-square statistics respectively; *(d)* *, * and *** denote coefficients are significant at 1, 5 and 10 per cent level respectively, *(e)* The null hypotheses for Wald Test (1), Wald Test (2) and Wald Test (3) respectively are that the explanatory variables, GD interactions and year dummies are jointly insignificant, and *(f)* The null hypothesis for Hausman Test is that the FE and RE estimators do not differ substantially i.e. the unobserved firm specific heterogeneities are not correlated with the explanatory variables.

Financial Constraints and Impact of Group Affiliations

The firms' level of debt is also influenced by their accessibility in the financial market (Stiglitz and Weiss, 1981; Diamond, 1991; Faulkender and Petersen, 2006). Firms with different market frictions such as higher level of information asymmetry, agency disputes and credit risks (constrained firms) have limited access to external resources in favourable terms and therefore maintain lesser debt. On the contrary, firms less affected by these market frictions (unconstrained firms) enjoy better access in financial market and generally maintain higher level of debt. Since, as per literature discussed in Section II, firms' affiliation to business groups affects all these market frictions, this section examines if the impact of group affiliation on debt ratios varies for firms with different level of financial constraints. Existing literature argues that group firms are relatively financially unconstrained in comparison to stand-alone firms (Gopalan *et al.*, 2007; Byun *et al.*, 2013).

This study however, instead of using group affiliation status, uses size of firms as a factor to distinguish between financially constrained and unconstrained firms. For this purpose, it follows the methodology adopted by Bessler *et al.* (2013). It first computes the cross-sectional size quintiles for each year and then computes the average quintile for each firm over the study period and sorts all the firms according to their average quintile. Firms in the lowest average quintile (i.e. Q1) are sorted as constrained firms and firms in the highest average quintile (i.e. Q5) are sorted as unconstrained firms. Like for the whole sample, it then uses the same FE regression separately in both the groups. Since unconstrained firms already have better access in financial markets, one can expect greater economically and statistically significant impact of group affiliation on different debt ratios for constrained firms.

Table 8

Descriptive Statistics (Constrained *versus* Unconstrained Firms)

This table reports the descriptive statistics of dependent and independent variables with tests for differences in their mean and median values between group and stand-alone firms for financially constrained and unconstrained firms separately:

	Constrained Firms								*Unconstrained Firms*							
	All Firms		*Group Firms*		*Stand-Alone Firms*			*Rank Sum*	*All Firms*		*Group Firms*		*Stand Alone Firms*			*Rank Sum*
Variables	*Mean*	*Med.*	*Mean*	*Med.*	*Mean*	*Med.*	*T-Test*	*Test*	*Mean*	*Med.*	*Mean*	*Med.*	*Mean*	*Med.*	*T-Test*	*Test*
Total Debt	0.35	0.21	0.33	0.21	0.36	0.21	-0.03 (-1.58)	-0.01 (-0.55)	0.39	0.42	0.37	0.39	0.41	0.44	-0.04 (-3.73)*	-0.05 (-4.02)*
Long-Term Debt	0.16	0.03	0.15	0.03	0.18	0.03	-0.03 (2.31)**	-0.01 (-2.08)**	0.24	0.21	0.21	0.16	0.27	0.26	-0.06 (-7.58)*	-0.10 (-8.99)*
Short-Term Debt	0.17	0.07	0.17	0.07	0.17	0.07	0.00 (0.33)	-0.01 (-0.14)	0.17	0.14	0.19	0.14	0.16	0.13	0.02 (3.49)*	0.01 (0.90)
Private Debt	0.06	0.00	0.04	0.00	0.07	0.01	-0.03 (-4.86)*	-0.01 (-3.06)*	0.18	0.12	0.16	0.09	0.19	0.14	-0.03 (-4.43)*	-0.05 (-6.72)*
Public Debt	0.28	0.16	0.28	0.17	0.28	0.15	0.00 (0.07)	0.02 (0.84)	0.24	0.20	0.23	0.19	0.24	0.21	0.00 (0.63)	-0.02 (-2.81)*
Size	2.43	2.52	2.49	2.62	2.40	2.45	0.09 (3.04)*	0.17 (3.99)*	7.62	7.47	7.63	7.46	7.60	7.50	0.03 (0.71)	-0.03 (0.13)
Tangibility	0.31	0.27	0.32	0.27	0.30	0.27	0.02 (2.02)**	-0.01 (-1.37)	0.30	0.29	0.28	0.27	0.32	0.30	-0.03 (-4.65)*	-0.02 (-4.57)*
Profitability	0.06	0.05	0.06	0.05	0.05	0.04	0.01 (3.32)*	0.02 (3.96)*	0.12	0.10	0.12	0.11	0.11	0.10	0.01 (3.65)*	0.01 (2.71)**
Non-Debt Tax Shield	0.07	0.03	0.07	0.03	0.07	0.03	0.00 (0.68)	0.00 (0.39)	0.05	0.03	0.05	0.03	0.06	0.04	-0.01 (-3.95)*	-0.01 (-5.32)*
Market to Book Ratio	1.09	0.79	1.13	0.85	1.07	0.77	0.06 (3.33)**	0.08 (3.00)*	1.87	1.30	2.06	1.40	1.66	1.23	0.40 (7.78)*	0.17 (6.48)*
Uniqueness	13.22	3.02	16.21	3.44	11.05	2.66	5.17 (4.50)*	0.77 (5.59)*	3.91	2.36	3.95	2.35	3.86	2.38	0.09 (0.37)	-0.03 (-0.13)

Note:(a) Figures in parentheses are t-statistics for T-Test and z-statistics for Rank Sum Test; *(b)* *, * and *** denote coefficients are significant at 1, 5 and 10 per cent level respectively.

Table 9

FE Regression (Constrained *versus* Unconstrained Firms)

This table reports the results of fixed effect regression model for financially constrained and unconstrained firms separately:

	Total Debt		*Long-Term Debt*		*Short-Term Debt*		*Private Debt*		*Public Debt*	
Variables	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*
Constant	0.18	0.24	0.07	-0.07	0.08	0.29	-0.01	-0.08	0.17	0.30
	(1.72)***	(2.15)**	(1.13)	(-0.74)	(1.51)	(3.64)*	(-0.48)	(-0.96)	(2.07)**	(2.98)*
Group Dummy	-0.15	0.01	-0.07	-0.01	-0.05	0.02	-0.04	-0.001	-0.09	0.02
	(-3.46)*	(0.92)	(-2.93)*	(-0.42)	(-2.07)**	(1.00)	(-2.80)*	(-0.14)	(-2.44)**	(1.20)
Size	0.07	0.03	0.03	0.05	0.04	-0.01	0.03	0.04	0.04	-0.001
	(2.29)**	(1.78)***	(1.41)	(3.67)*	(2.10)**	(-0.99)	(3.04)*	(3.40)*	(1.64)	(-0.17)
Tangibility	0.07	0.13	0.19	0.18	-0.10	-0.06	0.11	0.09	-0.01	0.02
	(0.66)	(2.22)**	(2.55)**	(3.23)*	(-1.21)	(-1.65)	(2.87)*	(1.90)***	(-0.15)	(0.53)
Profitability	-0.37	-0.74	-0.25	-0.46	-0.11	-0.33	-0.05	-0.28	-0.32	-0.51
	(-2.53)**	(-9.22)*	(-2.69)*	(-7.18)*	(-1.49)	(-6.28)*	(-1.12)	(-4.78)*	(-2.64)*	(-7.44)*
Non-Debt Tax Shield	0.55	0.07	0.07	0.11	0.41	0.01	-0.001	0.15	0.51	-0.02
	(2.75)*	(0.47)	(0.54)	(0.82)	(2.79)*	(0.06)	(-0.06)	(1.13)	(3.14)*	(-0.15)
Market to Book Ratio	0.09	0.01	0.05	0.003	0.04	0.002	0.02	0.003	0.07	0.003
	(4.08)*	(0.74)	(3.90)*	(0.68)	(2.87)*	(0.39)	(2.37)**	(0.70)	(4.36)*	(0.38)
Uniqueness	-0.002	0.0001	-0.001	0.001	-0.001	-0.001	-0.0003	0.0004	-0.002	-0.001
	(-3.16)*	(0.11)	(-2.81)*	(1.29)	(-1.81)***	(-1.71)***	(-2.12)**	(0.58)	(-3.33)*	(-0.58)
Adjusted R^2	0.79	0.79	0.66	0.71	0.66	0.70	0.52	0.64	0.75	0.65
Wald Test (1)	4.50*	11.80*	4.84*	29.40*	2.91*	12.06*	3.54*	16.09*	4.01*	10.72*
Wald Test (2)	2.26**	4.50**	2.44**	30.82*	2.67*	13.47*	3.01*	21.31*	1.41	11.70*
Hausman Test	127.69*	193.30*	45.59*	79.38*	43.95*	74.70*	24.61**	65.92*	75.84*	47.15*

Note: *(a)* Figures against variables are the coefficients and t-statistics (in parentheses); *(b)* Figures against Wald Test and Hausman Test are the F-statistics and chi-square statistics respectively; *(c)* *, * and *** denote coefficients are significant at 1, 5 and 10 per cent level respectively; *(d)* The null hypotheses for Wald Test (1) and Wald Test (2) respectively are that the explanatory variables and year dummies are jointly insignificant, and *(e)* The null hypothesis for Hausman Test is that the FE and RE estimators do not differ substantially i.e. the unobserved firm specific heterogeneities are not correlated with the explanatory variables.

Table 10
Interest Costs (Constrained *versus* Unconstrained Firms)

This table reports the comparison of interest costs between group and stand-alone firms for financially constrained and unconstrained firms separately:

	All Firms		*Group Firms*		*Stand-Alone Firms*			
Variable	*Mean*	*Median*	*Mean*	*Median*	*Mean*	*Median*	*T-Test*	*Rank-Sum Test*
Interest (Constrained)	0.08	0.01	0.07	0.02	0.10	0.01	-0.03 (-1.17)	0.01 (0.12)
Interest (Unconstrained)	0.06	0.03	0.05	0.02	0.07	0.04	-0.02 (-2.95)*	-0.02 (-10.03)*

Note: *(a)* Figures in parentheses are t-statistics for T-Test and z-statistics for Rank Sum Test; *(b)* * and ** denote coefficients are significant at 1 and 5 per cent level respectively.

Table 8 reports descriptive statistics separately for constrained and uncnstrained firms. The following lines provide a brief summary of descriptive statistics though inferences are drawn mainly from regression analysis. In comparison to stand-alone firms, group firms maintain lower level of long-term debt and private debt irrespective of their level of financial accessibility, and lower level of total debt and public debt when they are financially unconstrained. However, their reliance on short-term debt is higher than stand-alone firms when they are financially unconstrained. The results for explanatory variables are similar to that of whole sample with few exceptions. Differences in size and uniqueness are insignificant for unconstrained firms and NDTS is insignificant for constrained firms. Contrary to whole sample, group firms have lesser tangle assets when they are financially unconstrained.

Next, we interpret the results of FE regression reported in Table 9. The table shows that the impact of group affiliation on all types of debts is negative and statistically significant for financially constrained firms, but not for unconstrained firms. These findings imply that firms' group affiliation status is an important consideration in capital structure decision only when they are financially constrained. The comparison of interest, as reported in Table 10, shows that borrowing costs for group and stand-alone firms are not different in constrained category which rejects the possibility that the lower debt ratio for group firms is the result of their higher costs of borrowing. Further, the table shows that group firms have significantly lower interest costs than stand-alone firms in unconstrained category which is in direct contrast to the argument that the former incurs higher costs of borrowing due to tunneling of resources and other moral hazard activities. The results from interactive regression model (Table 11) provide some probable explanations to justify the negative impact of group affiliation under constrained subset. Coefficient of GD*MB is negatively significant for all types of debt except STD which indicate that group firms with higher growth opportunities use lesser debt financing than their stand-alone counterparts. Further, GD*TANG and GD*PROF are

Table 11

FE Regression with GD Interactions (Constrained *versus* Unconstrained Firms)

This table reports the results of fixed effect regression model with interactions of GD and conventional capital structure determinants for financially constrained and unconstrained firms separately:

	Total Debt		*Long-Term Debt*		*Short-Term Debt*		*Private Debt*		*Public Debt*	
Variables	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*
Constant	0.12	0.27	0.03	-0.07	0.07	0.32	-0.04	-0.09	0.13	0.34
	(1.15)	(2.33)**	(0.55)	(-0.80)	(1.23)	(4.05)*	(-1.19)	(-1.15)	(1.66)***	(-3.39)*
Size	0.07	0.03	0.02	0.05	0.05	-0.01	0.03	0.05	0.03	-0.01
	(1.96)***	(1.62)	(0.79)	(3.73)*	(2.43)**	(-1.24)	(2.64)*	(4.04)*	(1.31)	(-0.72)
Tangibility	0.16	0.12	0.26	0.19	-0.10	-0.10	0.14	0.04	0.03	0.06
	(1.40)	(1.77)***	(2.90)*	(3.24)*	(-1.13)	(-2.20)**	(2.75)*	(0.95)	(0.37)	(0.99)
Profitability	-0.32	-0.64	-0.11	-0.42	-0.19	-0.31	-0.01	-0.34	-0.28	-0.39
	(-1.63)	(-7.92)*	(-1.07)	(-5.40)*	(-2.02)**	(-4.45)*	(-0.19)	(-4.96)*	(-1.69)***	(-4.78)*
Non-Debt	0.71	0.08	0.18	-0.01	0.42	0.15	0.04	0.05	0.62	0.09
Tax Shield	(3.56)*	(0.51)	(1.21)	(-0.06)	(2.25)**	(1.07)	(0.52)	(0.49)	(3.62)*	(0.77)
Market to	0.13	-0.01	0.07	0.00	0.04	-0.01	0.03	0.00	0.10	-0.01
Book Ratio	(4.16)*	(-0.94)	(3.78)*	(0.20)	(2.36)**	(-0.96)	(2.31)**	(0.75)	(4.56)*	(-1.40)
Uniqueness	-0.003	0.003	-0.002	0.002	-0.001	0.0001	-0.001	-0.001	-0.002	0.002
	(-3.19)*	(1.83)***	(-3.60)*	(1.34)	(-1.16)	(0.12)	(-2.83)*	(-0.67)	(-3.08)*	(1.42)
GD*Size	0.02	0.00	0.04	0.00	-0.02	0.00	0.01	-0.01	0.01	0.01
	(1.07)	(0.11)	(3.00)*	(0.56)	(-1.48)	(0.21)	(1.15)	(-2.06)**	(0.96)	(0.97)
GD*	-0.23	0.03	-0.18	-0.02	0.00	0.06	-0.09	0.11	-0.11	-0.07
Tangibility	(-1.53)	(0.30)	(-1.68)***	(-0.25)	(0.01)	(1.18)	(-1.47)	(1.61)	(-0.89)	(-1.06)
GD*	-0.07	-0.15	-0.28	-0.06	0.17	-0.02	-0.07	0.11	-0.07	-0.20
Profitability	(-0.30)	(-1.06)	(-1.76)***	(-0.49)	(1.34)	(-0.21)	(-0.81)	(1.13)	(-0.31)	(-1.60)
GD* Non-Debt	-0.29	-0.01	-0.16	0.26	-0.04	-0.28	-0.07	0.19	-0.19	-0.21
Tax Shield	(-0.91)	(-0.03)	(-0.67)	(1.24)	(-0.19)	(-2.17)**	(-0.80)	(1.03)	(-0.75)	(-1.51)

Table 11 *(contd.)*

FE Regression with GD Interactions (Constrained *versus* Unconstrained Firms)

This table reports the results of fixed effect regression model with interactions of GD and conventional capital structure determinants for financially constrained and unconstrained firms separately:

	Total Debt		*Long-Term Debt*		*Short-Term Debt*		*Private Debt*		*Public Debt*	
Variables	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*
GD* Market to Book Ratio	-0.07 (-2.24)**	0.02 (1.81)***	-0.06 (-2.66)*	0.01 (0.83)	0.00 (0.09)	0.01 (1.47)	-0.02 (-1.87)***	0.00 (0.22)	-0.05 (-2.29)**	0.02 (1.94)**
GD* Uniqueness	0.001 (1.54)	-0.004 (-2.26)**	0.001 (2.53)**	-0.001 (-0.66)	-0.0001 (-0.22)	-0.002 (-1.23)	0.001 (2.45)**	0.001 (1.11)	0.001 (1.14)	-0.004 (-2.11)**
Adjusted R^2	0.80	0.79	0.67	0.71	0.66	0.70	0.52	0.64	0.76	0.65
Wald Test (1)	4.36*	10.37*	5.36*	23.72*	2.39*	10.13*	3.20*	12.54*	3.65*	9.08*
Wald Test (2)	2.01***	1.97***	3.16*	0.48	0.98	2.30**	2.70*	1.98***	2.13**	2.77**
Wald Test (3)	2.33**	4.36*	2.60**	30.42*	2.56**	13.42*	3.19*	21.51*	1.42	12.01*
Hausman Test	105.65*	163.56*	53.67*	103.05*	49.18*	86.51*	42.38*	75.30*	77.58*	59.21*

Note: *(a)* GD stands for Group Dummy; *(b)* Figures against variables are the coefficients and t-statistics (in parentheses); *(c)* Figures against Wald Test and Hausman Test are the F-statistics and chi-square statistics respectively; *(d)* *, * and *** denote coefficients are significant at 1, 5 and 10 per cent level respectively; *(e)* The null hypotheses for Wald Test (1), Wald Test (2) and Wald Test (3) respectively are that the explanatory variables, GD interactions and year dummies are jointly insignificant; and *(f)* The null hypothesis for Hausman Test is that the FE and RE estimators do not differ substantially i.e. the unobserved firm specific heterogeneities are not correlated with the explanatory variables.

negatively significant for LTD in constrained category which imply that group firms increase and decrease their long-term debt financing lesser and higher than stand-alone firms with the increase in tangibility and profitability respectively. These results indicate group firms' likely motive to maintain financial flexibility, and to avoid long-term commitments and underinvestment problem in future when they are smaller in size. On the contrary, GD*MB is positively significant for TD and PBLD in unconstrained category which imply that larger group firms with higher growth opportunities use higher level of public debt than their stand-alone counterparts to meet their financing needs.

Most of the conventional variables in Table 9 and Table 11 are showing similar results as documented in case of whole sample. SIZE has positive impacts on different types of debt ratios with few exceptions. TANG positively influence debt financing except for STD and PBLD which implies that collaterals are less important for short-term and public debts. PROF is negatively related to different debt ratios, although the economic and statistical significance is higher for unconstrained firms than constrained firms. This is against the argument that the pecking order theory works better for smaller firms due to severe adverse selection problems but consistent with findings of Frank and Goyal (2003) and Chakraborty (2013). NDTS seems to have no influence on capital structure decision of unconstrained firms as its coefficients are insignificant in all cases. However, it has significantly positive coefficients for TD, STD and PBLD in constrained category, which are against the notion of trade-off argument (DeAngelo and Masulis, 1980).

The M/B ratio has positively significant coefficients for all types of debts when firms are financially constrained. These results indicate higher value for growing firms to afford higher debt financing (Titman and Wessels, 1988; Banerjee *et. al.*, 2000), higher requirements of funds to meet their capital expenditures (Bhaduri, 2010; Chakraborty, 2010) or their desire to maintain target level of debt ratio with higher retained earnings (Chang and Rhee, 1990). However, its coefficients are statistically insignificant for unconstrained firms. Higher level of internally generated funds for larger firms to meet their financing requirements may be the possible explanation for the same. Finally, the significant negative coefficients of UNIQ for constrained firms indicate that constrained firms dealing with unique products use lesser debt due to higher financial distress and bankruptcy costs.

Section VI
Conclusion

This paper empirically investigates the impact of business group affiliation on firms' leverage ratio in India. In order to better understand the relationship, it segregates firms' total debt on the basis of maturity structure i.e. long-term debt and short-term debt, and ownership structure i.e. private debt and public

debt. To draw inferences, it considers a balanced panel of 1510 non-financial non-utility listed firms over a period of nine years from 2005 to 2013. By using panel fixed effect regression model, it shows that business group affiliation has negative impact on firms' long-term debt, public debt and overall debt ratio. It further finds that cost of borrowing is not the factor behind lower debt ratios for group firms. Rather, the findings indicate group firms' concern for financial flexibility to avoid underinvestment problem in future as they have significantly higher growth opportunities than their stand-alone counterparts.

Most importantly, separation of constrained and unconstrained firms reveals that group affiliation influences firms' debt ratio only when they are financially constrained. Finally, the study finds the coefficients of conventional capital structure determinants significant with expected signs and consistent with prior empirical studies. This study is expected to be an important contribution to the existing literature. The findings of the study not only have practical implications for financial managers, but also for future empirical research on capital structure. First, unlike prior studies (Manos *et al.*, 2007; Chakraborty, 2013), this study segregates firms' debt ratio on the basis of maturity and ownership structure to better understand the impact of group affiliation. Secondly, it separates financially constrained and unconstrained firms which appears to be an important factor that determines the nature of impact of group affiliation on firms' debt ratio. Therefore, future empirical studies on this topic may take this into consideration. Finally, some findings such as lower costs of borrowing and higher growth opportunities for group firms, negative impact of group affiliation on debt ratios of constrained firms, group firms' concern for financial flexibility etc. are expected to help financial managers in designing their capital structure.

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