Impact of business group affiliation on cost of debt: Evidence from India*

Narahari Hansoge
Indian Institute of Management Tiruchirappalli
narahari@iimtrichy.ac.in

A research project under the NSE-IGIDR Corporate Governance Research Initiative
This draft: May 13, 2015
Preliminary draft report, please do not cite

---

*Acknowledgements: I thank participants at the NSE-IGIDR International Conference on Corporate Governance for valuable comments (especially paper discussant Prof.Vikram Nanda whose comments and feedback improved the paper substantially). I also thank Apalak Khatua and Prof.Vijay Marisetty for helping me identify the topic of this paper and for initial discussions, NSE & IGIDR for the research grant and IIMA for access to Prime database. The responsibility for all errors is mine.

Impact of business group affiliation on cost of debt: Evidence from India

Abstract

In this paper, I study the effect of group affiliation on cost of debt by empirically examining two competing hypotheses - coinsurance and tunneling. I analyze 363 bond offerings by group affiliated and standalone firms over the years 1998 to 2014. The evidence presented in this study suggests that, on average, group affiliated firms have a lower cost of debt as compared to similar standalone firms. In addition, the credit worthiness of other member firms in a group favourably impacts an affiliated firm's cost of debt. This evidence suggests that group affiliated firms enjoy co-insurance benefits. However, such co-insurance benefits may be restricted to only those firms that have a high insider holding. A larger sample set will help us analyze and answer several other related questions.

JEL Classification: G32, G34.

Keywords: business groups, cost of debt, coinsurance, tunneling

1. Introduction

Outside the Anglo-American universe, business groups (BGs) are a dominant form of business organisation. Before the multiple taxation of intercorporate dividend reforms in the 1930s, pyramidal business groups were a common feature of the American economy as well (Morck (2005)). Currently, business groups are ubiquitous in several emerging and a few developed economies - including India, South Korea, China, Latin America, Japan and Germany. In spite of their leading role in these economies, business groups are relatively under-researched and poorly understood [Credit-Suisse (2011)[1], Colpan et al. (2010) etc.].

In this paper, I study the effect of group affiliation on cost of debt. The co-insurance hypothesis states that business group affiliated firms enjoy a lower cost of debt due to internal capital market benefits and bankruptcy protection offered by business groups whereas the tunneling hypothesis states that group firms have a higher cost of debt due to risk of expropriation of debt holders by the controlling shareholders. I perform an empirical test of the two competing hypotheses by examining data on privately placed bonds. Private bonds account for a significant portion of the Indian corporate bond market and are an appropriate choice for testing this question. I analyze 363 bond offerings over the years 1998 to 2014.

The evidence presented in this study suggests that, on average, group affiliated firms have a lower cost of debt as compared to similar standalone firms. In addition, the credit worthiness of other member firms in a group favourably impacts an affiliated firm's cost of debt. This evidence suggests that group affiliated firms enjoy co-insurance benefits. However, such co-insurance benefits may be restricted to only those firms that have a high insider holding. Surprisingly, the analysis shows that group scale and diversification do not impact an affiliated firm's cost of debt.

[1]This study reports that family business groups account for a third of Asia's market capitalization and close to half of India - indicating their dominance and importance.

Section 2 of the paper describes the motivation and hypotheses development, Section 3 documents the methodology and data, Section 4 presents the results and Section 5 concludes.

2. Motivation and Hypotheses Development

Recent research has stressed that instead of painting business groups (BGs) as either "paragons" or "parasites", a more nuanced approach would help us to better understand this wide-spread but complex organizational form (Khanna and Yafeh (2007); Colpan et al. (2010)). A step in this direction would be to analyze the effect of group affiliation on various stakeholders. While a few studies focus on the social impact of business groups (For example, Fisman and Khanna (2004); Almeida and Wolfenzon (2006)), most of the extant studies focus on equity shareholders of group affiliated firms and only a handful of studies analyze the impact of group affiliation on debt holders (Byun et al. (2013)). In this paper, I try to address this gap in the literature by analyzing the impact of group affiliation on firm cost of debt.

A recent paper (Byun et al. (2013)) explores the effect of group affiliation on cost of debt by examining the South Korean bond market. To a certain extent, my paper is a replication of this paper. However, it is pertinent to note that the conceptualization and definitions of business groups vary across nations (Colpan et al. (2010)) and while there have been several cross-country studies of business groups, Khanna (2000) documents that same-country studies are more reliable than multiple-country studies. Evidence suggest that group affiliation can have quite disparate implications for firm policies across different countries. For example, Gopalan et al. (2007), Jiang et al. (2010) and Buchuk et al. (2014) study the internal capital markets of business groups using intra-group loans data in India, China and Chile respectively. Gopalan et al. (2007) find that intra-group loans are used to provide support for financially weak group firms and to avoid the negative spill-over effects of a group firm going bankrupt. Jiang et al. (2010) find that intra-group loans are a tunneling device and are used by controlling shareholders to expropriate minority shareholders. Finally, Buchuk et al. (2014) find that intra-group loans

are used to efficiently reallocate capital from (relatively) poor performing firms to better performing firms in a group. This example shows that single country studies are vital to gain a better understanding of the complex phenomenon of business groups.

A typical business group has numerous firms operating in a diversified set of industries and hence is better positioned to service debt on account of the coinsurance benefits derived from its internal capital markets (Ferris et al. (2003)). Further, the group structure also offers bankruptcy protection to its members (Gopalan et al. (2007)). Thus, the coinsurance hypothesis states that group affiliated firms enjoy a lower cost of debt. On the other hand, controlling shareholders of the group can engage in tunneling (i.e., transfer of wealth from minority shareholders and/or debt holders to controlling shareholders), which by its very nature, is hard to detect (Bertrand et al. (2002)). This expropriation risk is anticipated by the debt holders and according to the tunneling hypothesis, debt holders demand a higher cost of capital for lending to group affiliated firms (Byun et al. (2013)). Due to these opposing forces, the net impact of group affiliation on cost of debt becomes an empirical question. I hypothesize that the benefits from coinsurance dominate the tunneling effect (at least in the context of the Indian debt market)[2] and formulate Hypothesis-1 as:

H.1 *Group affiliated firms have a lower cost of debt as compared to similar standalone firms*

If the results suggest that the cost of debt of group affiliated firms is significantly different (i.e., either higher or lower) from standalone firms, a natural extension of the research question is what characteristics of business groups cause this difference. We examine two basic group characteristics - diversification (scope) and size (scale). Diversified groups have access to uncorrelated cash flows and the resultant coinsurance effect might help group affiliated firms to have a lower cost of debt (Khanna and Yafeh (2005)). On the other hand, diversification may be used as

[2]Informal conversations with practitioners in the Indian debt market revealed that though bond credit ratings are based purely on firm financials, "it is easier to place a Tata group A paper as compared to a similar A paper of a standalone company." (paper is bond market jargon for debt issues). Hypothesis-1 has been framed based on such feedback from practitioners and in light of existing evidence (Byun et al. (2013))

a tool by business groups to facilitate tunneling from firms engaged in the group's core activity to firms engaged in non-core activities (Kali and Sarkar (2011)). This expropriation risk may cause debt investors to demand a higher cost for their funds. Group size may have a moderating influence on the coinsurance or tunneling effects. In this context, it is useful to think of group size as access to resources. Large groups with access to numerous resources (Guillen (2000)) can provide stronger coinsurance benefits to their member firms. Group affiliated firms may be able to use their group reputational capital (Morck et al. (2005)) to negotiate for lower cost of funds from bond investors. However, group size can have a negative impact on affiliated firm value as a large group with numerous firms offers more opportunity for the controlling shareholder to tunnel resources (through intra-group transactions) compared to a small group with only a few firms (Bertrand et al. (2002)). In line with Hypothesis-1, I theorize that both group scope and scale strengthen the coinsurance effect:

H.2a *Group scope reduces cost of debt for affiliated firms*

H.2b *Group scale reduces cost of debt for affiliated firms*

Tunneling is more likely to occur from firms where the group owner has low cash flow rights to firms where the group owner has high cash flow rights (Bertrand et al. (2002); Ayyagari et al. (2013))[3]. Minority shareholders of Low Cash Flow Right (LCFR) firms[4] are more likely to be expropriated as such firms are more likely to be tunneled out of - either to the benefit of other firms in the group or to the private benefit of the group owner or both. Prior literature shows that compared to LCFR firms, High Cash Flow Right (HCFR) firms are more sensitive to their own industry shocks and also benefit the most from industry shocks that affect other firms in the group. This benefit is more pronounced for shocks affecting LCFR firms. This suggests that resources are tunneled out from LCFR firms to HCFR firms (Bertrand et al.

[3]To illustrate, consider a group with 2 firms with the group owner having a 10% stake in firm A and a 60% stake in firm B (with no cross holdings between the 2 firms). The group owner owns Rs.10 of an asset worth Rs.100 in firm A. If they are able to tunnel Rs.30 of the asset from firm A to firm B, their total ownership of the asset (ignoring transaction costs) increases to Rs.25 i.e. 10% * Rs.(100-30) + 60% * Rs.30. Obviously, a transfer in the opposite direction (from firm B to firm A) is not in their interest as it reduces their overall wealth.

[4]Henceforth, for ease of exposition, group firms in which the group owner has high/low cash flow rights (relative to other firms in the group) are referred to as high/low cash flow right firms (HCFR/LCFR firms)

(2002)). Consistent with the expropriation motive, less (more) valuable projects tend to be housed in LCFR (HCFR) firms - thus enabling the group owner to benefit from the selective placement of projects in different group firms (Ayyagari et al. (2013)). The above expropriation argument can be extended to debtholders (Lin et al. (2011); Byun et al. (2013)) as it increases the credit risk of lending to LCFR firms. Thus, Hypothesis-3 is stated as:

H.3 *Group affiliated firms with low insider holding (LCFR firms) have relatively higher cost of debt*

In spite of being separate legal entities, group affiliated firms are inter-twined in numerous apparent and hidden ways (Granovetter (1995); Gopalan et al. (2007); Seth and Marisetty (2010)). The extent of support available to a BG firm from fellow member firms depends on the financial condition of the fellow member firms. This inter-relationship between firms of a business group affects the extent to which a firm can expect co-insurance benefits and as a result, the bond yield required by the firm's bondholders. A firm that is part of a group that has higher credit ratings might enjoy a lower cost of debt compared to a similar firm that is part of a group with lower credit ratings. Thus, Hypothesis-4 is stated as:

H.4 *The cost of debt of a group affiliated firm is impacted by the credit ratings of other member firms*

3. Methodology and Data

Indian firms largely depend on banks for debt financing (Nath (2012)). Since details of bank loans are not disclosed, it is not feasible to investigate the cost of bank debt. The Indian corporate bond market is in its infancy and is highly illiquid (Chakrabarti (2008)) and hence not appropriate for studying the cost of debt. As a result of the underdeveloped public bond market, most corporate bonds are issued using the private placement route[5]. In the four financial years

[5]Per the Indian Companies Act (2013), any bond issue made to 49 or lesser number of investors is considered as a private placement. Private placements are typically targeted at institutional investors like mutual funds, insurance companies and foreign institutional investors.

from 2009 to 2012, bonds issued in the private placement route accounted for more than 98% of the total bond offerings - both by number of issues and amount raised (Khanna and Varottil (2012))[6]. For the regression analysis in the paper, I use data on new issues of privately placed bonds, with bond Credit Spread (CS) as the dependent variable. CS (expressed as a percentage) is the difference between the coupon rate of a newly issued bond and the yield of the government security with the closest maturity[7].

3.1. Data sources

The primary data source for bond issuances through the private placement route is the Prime database[8]. Data from Prime have been used in many studies[9] and is generally considered the most reliable database on Indian primary capital markets. I use Prime to obtain data on issuer name, bond series, coupon rates, tenor and ratings (along with other items) for all bond issuances. Data on firm financials are obtained from Prowess database. As Siegel and Choudhury (2012) observe, data from Prowess has been used in several studies in the finance and strategy literature and is generally accepted as the most reliable database for Indian companies. Prowess provides both accounting and stock market data. Group affiliation and industry classification data are also obtained from Prowess. Khanna and Palepu (2000) document that the ownership and industry classification provided by Prowess is fairly accurate. Prowess assigns a 5 digit National Industrial Classification (NIC) Code to all companies and this is used for industry classification in this study[10]. The NIC Code for economic activity (published by the Government of India) is based on the International Standard Industrial Classification (ISIC) of Economic Activities developed by the United Nations.

[6] In India, a financial year is the period from April of the previous year to March of the current year.

[7] Note that at the time of issue, bond coupon rates are approximately equal to their yield to maturity (YTM)

[8] I thank IIMA, my alma mater, for access to Prime database. Henceforth, unless stated otherwise, all references to bonds are to privately placed bonds.

[9] For example, Bubna and Prabhala (2013), Bubna and Prabhala (2011) etc.

[10] Prowess classifies firms having substantial operations in more than one industry as "Diversified" firms. Bond issuances from such firms have been excluded from the final sample.

3.2. Sample description

Data on bond issuances is available in Prime from the financial year 1996. I consider only Indian private sector firms operating in non-financial industries for this study (i.e., government firms, foreign firms, private-public joint ventures etc., are excluded). Indian private sector firms are divided into two categories - firms affiliated with business groups (BG firms) and standalone firms (SA firms). If a firm has more than one bond issue in a year, the largest issue is considered in the sample. If there are multiple largest issues, the issue with the highest tenor is considered. In case of multiple issues with the highest tenor, the issue with the largest credit spread is considered. If there are multiple issues still, one of the issues is randomly selected[11]. In other words, for firms with multiple issuances in the same year, only one bond issue is considered in that year. The final sample with data on all variables consists of 363 bond issues[12].

Table-1 presents the distribution of these issuances by industry and credit rating. Ratings for bond issues are obtained by the issuing company from independent credit rating agencies. Prominent Indian credit rating agencies are CRISIL (an affiliate of S&P), CARE and ICRA (an affiliate of Moody's). For bonds with ratings from multiple agencies, the lowest rating is considered. Most bonds in the sample are issued by firms in the manufacturing industry (while financial firms are the largest issuers, as is common in the literature, I have restricted the sample to non-financial firms). Around 98% of the issues are rated A and above. This is a reflection of the overall Indian corporate bond market as only the highest rated India companies issue most of the bonds (Khan (2012)). I manually match the company names from Prime to Prowess database to obtain accounting information. The final sample period is from 1998 to 2014.

[11]There is no theoretical basis for the tie-break procedure followed above. As a robustness test, I use shortest tenor and lowest credit spread to break the ties and obtain qualitatively similar results.

[12]Out of an initial sample of 839 bond issues by 226 non-financial BG and SA firms, 264 bond issues were excluded by the size tie-breaker, 18 by the tenor tie-breaker, 32 by the credit spread tie-breaker and 6 by the random tie-breaker. This resulted in a sample of 519 unique bond issues. Out of these, financial information was not available for 156 issues and hence the final sample consists of 363 bond issues.

3.3. Regression models

The following regression specification, estimated on a sample of both group (BG) and standalone (SA) firms, is used to test Hypothesis-1

Model-M1:

$$\text{CS}_{j,t} = constant + \beta_1 * (BG\ dummy)_j + \beta_2 * Rating_{j,t} + \beta_3 * Issue\ size_{j,t} + \beta_4 * Maturity_{j,t} + \beta_5 * Tangibility_{j,t-1} + \beta_6 * Profitability_{j,t-1} + industry\ and\ year\ dummies + \varepsilon_{j,t} \quad (1)$$

Please see Appendix-A for variable definitions. As mentioned earlier, for firms with multiple issuances in the same year, only one bond issue is considered. Hence subscript j can indicate both the firm and the bond issue. Firm characteristics (based on accounting data) are included with a one period lag to ensure that the information is known to the market at the time of the bond issue. I expect a negative sign on the BG dummy coefficient indicating that bond issuances by BG firms have lower credit spreads. I also expect negative coefficients on Rating, Issue size, Profitability and Tangibility indicating that credit spreads are lower for highly rated and larger bond issues and for profitable firms and firms with more tangible assets. I expect a positive coefficient on Maturity as the term structure of interest rates is generally upward sloping and credit spreads tend to increase with maturity.

The following regression specification, estimated on a sample of only BG firms, is used to test Hypothesis-2a and Hypothesis-2b

Model-M2:

$$\text{CS}_{j,t} = constant + \beta_1 * Rating_{j,t} + \beta_2 * Issue\ size_{j,t} + \beta_3 * Maturity_{j,t} + \beta_4 * Tangibility_{j,t-1} + \beta_5 * Profitability_{j,t-1} + \beta_6 * Net\ Group\ Assets_{j,t-1} + \beta_7 * Group\ Entropy_{i,t-1} + industry\ and\ year\ dummies + \varepsilon_{j,t} \quad (2)$$

Model-M2 includes two variables in addition to those in Model-M1. Group Assets and Entropy measure group scale and scope respectively[13]. I expect negative coefficients for both Net Group Assets and Group Entropy indicating that firms belonging to large and diversified groups have lower credit spreads.

The following regression specification, estimated on a sample of only BG firms, is used to test Hypothesis-3

Model-M3:

$$\text{CS}_{j,t} = constant + \beta_1 * Rating_{j,t} + \beta_2 * Issue\ size_{j,t} + \beta_3 * Maturity_{j,t} + \beta_4 * Tangibility_{j,t-1} + \beta_5 * Profitability_{j,t-1} + \beta_6 * LCFR\ dummy(only\ BG)_j + industry\ and\ year\ dummies + \varepsilon_{j,t} \quad (3)$$

The LCFR dummy(only BG) takes a value of 1 for firms with promoter holding lower than the group median promoter holding and 0 for firms with promoter holding greater than the group median promoter holding[14]. The categorization is done at the level of each group. This dummy is defined only for BG firms. In line with the tunneling hypothesis (Bertrand et al. (2002)), I expect a positive coefficient on the LCFR dummy indicating that LCFR firms have a higher cost of debt (as compared to HCFR firms).

[13]Please see Appendix-A for variable definitions

[14]For robustness, the LCFR dummy is also defined using the 75th percentile of the group promoter holding instead of the group median.

As a supplementary test, I run a modified version of Model-M3 on both BG and SA firms. This modified regression model helps us to understand the difference in cost of debt among 3 categories of firms - SA, LCFR and HCFR firms[15]:

Model-M4:

$$\text{CS}_{j,t} = constant + \beta_1 * Rating_{j,t} + \beta_2 * Issue\ size_{j,t} + \beta_3 * Maturity_{j,t} + \beta_4 * Tangibility_{j,t-1} + \beta_5 * Profitability_{j,t-1} + \beta_6 * LCF\_BG\ dummy_j + \beta_7 * HCF\_BG\ dummy_j + industry\ and\ year\ dummies + \varepsilon_{j,t} \quad (4)$$

The LCF_BG dummy takes a value of 1 for LCFR firms and 0 for HCFR and SA firms while the HCF_BG dummy takes a value of 1 for HCFR firms and 0 for LCFR and SA firms (The reference set in Model-M4 is SA firms). Per Hypothesis-1, BG firms are expected to have a lower cost of debt vis-à-vis SA firms and per Hypothesis-3, HCFR firms are expected to have a lower cost of debt vis-à-vis LCFR firms. Model-M4 is thus a joint test of Hypothesis-1 and Hypothesis-3. Therefore, I expect negative coefficients on both LCF_BG and HCF_BG dummies and a higher negative value for the HCF_BG dummy coefficient.

Hypothesis-4 is tested using Model-M5:

Model-M5:

$$\text{CS}_{j,t} = constant + \beta_1 * Rating_{j,t} + \beta_2 * Issue\ size_{j,t} + \beta_3 * Maturity_{j,t} + \beta_4 * Tangibility_{j,t-1} + \beta_5 * Profitability_{j,t-1} + \beta_6 * Group\ rating_{j,t-1} + industry\ and\ year\ dummies + \varepsilon_{j,t} \quad (5)$$

Group rating is the asset weighted average of bond ratings of all firms in a group excluding firm *j*. This variable is calculated for firm j only if a minimum of 2 firms in its group have a credit rating in the financial year previous to the year of bond issuance. The variable *Group rating* is constructed to capture the average credit rating of the group. I expect a negative coefficient on this variable as a better group rating is expected to lower the cost of debt of all affiliated firms

[15]Note that LCFR and HCFR are group affiliated firms

in the group.

Ordinary Least Squares (OLS) estimation method is used for all models. Industry and year dummies are included to control for industry and year fixed effects. t-statistics are calculated based on robust standard errors to correct for heteroskedasticity and adjusted for clustering at the firm level.

4. Results and Discussion

4.1. Univariate Analysis

Table-2 presents the descriptive statistics of the regression sample. Variable definitions are given in Appendix-A. The date presented in Table-2 suggest that bonds issued by BG firms have lower credit spreads, higher ratings and are larger as compared to bonds issued by SA firms. The correlations presented in Table-3 provide additional support in the same direction. These results provide evidence in favour of the coinsurance effect (Hypothesis-1). Table-5 presents the means and medians of the regression sample for LCFR and HCFR firms. Apart from tangibility and profitability, the averages indicate that HCFR and LCFR firms do not differ on other characteristics. This univariate analysis is inconclusive for the purpose of Hypothesis-3.

4.2. Regression Analysis

The results of Model-M1 and M2 are presented in Table-4. The estimated coefficient on the BG dummy in Model-M1 is negative and significant indicating that BG firms have lower credit spreads. At the mean level, the average credit spread of a bond issued by a BG firm is lower by 7% (-0.281/4.102) as compared to a similar bond issued by a SA firm. This evidence supports Hypothesis-1 and indicates that BG firms have lower credit spreads. This suggests that the coinsurance effect dominates the tunneling effect in business groups. All other significant coefficients

are as anticipated except for Maturity[16].

Model-M2 is estimated on a subsample of only BG firms. The significant relationships in Model-M1 continue in M2 as well. However, I do not find support for Hypotheses-2a and 2b. While the negative coefficient on Group Entropy indicates that diversification reduces the firm cost of debt, it is not statistically significant. The positive (but insignificant) coefficient on Net Group Assets indicates that group size increases the firm cost of debt. Given the insignificant coefficients, I am unable to conclude either in favour of or against Hypotheses 2a and 2b.

The regression results of Models M3 to M5 are presented in Table-6. The results in the column headings with the suffix 75p are based on dummies constructed using the 75th percentile of group promoter holding as the cut-off. Similar to the univariate analysis, the coefficients on the LCFR dummy in Models M3 and M3(75p) are insignificant (though the sign is on expected lines). However, the HCF_BG dummy in Model-M4 has a significant negative coefficient indicating that HCFR firms have a lower cost of debt compared to standalone firms while the cost of debt for LCFR firms is similar to that of standalones[17]. The results for Model-M4(75p) are stronger as both the LCF_BG and HCF_BG dummies have significant and negative coefficients with the value of the HCF_BG dummy coefficient being lower (more negative) than the coefficient on the LCF_BG dummy. This suggests that group firms have a lower cost of debt compared to standalone firms and that firms with high promoter holding benefit the most. Taken together, these results suggest that significant co-insurance benefits of group affiliation may be available only to firms that are higher in the group pyramid.

[16]The negative coefficient on maturity is puzzling as bonds with longer maturities are expected to have higher credit spreads. In unreported analysis, I estimate Model-M1 on a sample of BG and SA firms that are matched by industry & size but find qualitatively similar results. As of now, I am unable to explain this. An alternate view is maturity need not be included as an independent variable since CS is the difference between the bond coupon rate and the yield of the government security with the closest maturity. In unreported analysis, I estimate all regressions without the maturity variable and obtain qualitatively identical results

[17]i.e., even though the sign is negative, it is statistically insignificant

The negative coefficient on group rating in Model-M5 provides support for Hypothesis-4. In line with the literature that views a business group as a harmonious collection of individual member firms (Granovetter (1995); Gopalan et al. (2007); Seth and Marisetty (2010)), the results suggest that the credit ratings of fellow group member firms favourably impact a firm's cost of debt. This provides further support for the co-insurance hypothesis[18].

5. Conclusion

In this paper, I use issuance data of privately placed bonds to examine if the coinsurance or tunneling effect dominates in Indian business groups. Privately placed bonds account for a significant portion of the Indian corporate bond market. The evidence presented in this study suggests that, on average, group affiliated firms have a lower cost of debt as compared to similar standalone firms. In addition, the credit worthiness of other member firms in a group favourably impacts an affiliated firm's cost of debt. This evidence suggests that group affiliated firms enjoy co-insurance benefits. However, such co-insurance benefits may be restricted to only those firms that have a high insider holding.

The analyses in this paper throws up a few interesting but unresolved questions. If firms with high insider holding are the recipients of co-insurance benefits, then how are these firms propped? Do group owners use their personal resources to prop up such firms or do they tunnel out resources from other member firms? What role does group diversification play in the co-insurance mechanism? Is the positive "spillover" from other firms in the group (as measured by average group credit ratings) restricted to only firms with high insider holding? Some of these questions may be answered by employing a larger sample set. A larger sample set would also increase our confidence in these results. I am currently working on expanding the sample size.

[18]It would have been interesting to study the interaction between group rating and LCFR dummy to analyze if the co-insurance benefit depends on insider ownership (as suggested by Model-M4 results). However, I am unable to do this analysis due to the small sample size

Our understanding of cross holdings of debt securities in a business group is limited - mainly due to data unavailability. Examining the nature of debt holders of BG firms will help us unravel some aspects of internal capital (debt) markets of business groups and this can be a substantial contribution to the business group literature.

Appendix-A: List of variables and their definitions

Variable name	Variable definition
Panel A: Bond Issue level variables	
Credit Spread	Credit Spread (expressed as a percentage) is the difference between the coupon rate of a newly issued bond and the yield of the government security with the closest maturity. Yields for government bonds are obtained from RBI website.
Issue size	The total amount of the bond issue deflated using the Consumer Price Index (CPI) values obtained from IMF website (Year 2001=100)
Maturity	Tenor of a newly issued bond in years
Rating	Ratings assigned to bond issues are converted to a numerical scale with a AAA rating assigned the value 20 and a D rating assigned the value 1. If a bond has more than one rating from different agencies, the lowest rating is considered.
Panel B: Firm level variables	
Business Group (BG) dummy	A dummy variable taking a value of 1 for group affiliated firms and 0 for unaffiliated firms.
Group rating	Asset weighted average of bond ratings of all firms in a group excluding the firm in question. This variable is calculated for a BG firm only if a minimum of 2 firms in its group have a credit rating in the financial year previous to the year of bond issuance.
HCF_BG dummy	A dummy variable that takes a value of 1 for HCFR firms and 0 for LCFR and standalone (SA) firms. This is used along with LCF_BG dummy in Model-M4 (regression sample of Model-M4 consists of both BG and SA firms).
LCFR dummy (only BG)	A dummy variable taking a value of 1 for firms with promoter holding lower than the group median promoter holding and 0 for firms with promoter holding greater than the group median promoter holding. The categorization is done at the level of each group. This dummy is defined only for BG firms.
LCF_BG dummy	A dummy variable that takes a value of 1 for LCFR firms and 0 for HCFR and standalone (SA) firms. This is used along with HCF_BG dummy in Model-M4 (regression sample of Model-M4 consists of both BG and SA firms).

Variable name	Variable definition
Leverage	Ratio of firm's total borrowings to total assets.
Net Group Assets	Total assets of the group to which a firm belongs excluding the firm's assets. Nominal amounts are deflated using the Consumer Price Index (CPI) values obtained from IMF website (Year 2001=100)
Profitability	Ratio of firm's profit after tax (adjusted for extraordinary items) to its total assets.
Tangibility	Ratio of firm's property, plant and equipment to its total assets.
Panel C: Business Group level variables	
Group Entropy	Group Entropy for group i present in n industries for year t is defined as $GE_{it} = \sum_{d=1}^{n} P_{idt} * ln(1/P_{idt})$, where d indicates an industry at the 5 digit NIC level and $P_{idt} = Segment\ Sales_{idt}/Total\ Group\ Sales_{it}$. Diversified and financial firms are excluded. For all firms belonging to group i, the Group Entropy is set equal to group i's Entropy

Notes:
1. Data for all variables are from Prime and Prowess databases.
2. All group level variables are calculated considering both listed and unlisted firms in the group.

References

Almeida, H., Wolfenzon, D., 2006. Should business groups be dismantled? The equilibrium costs of efficient internal capital markets. Journal of Financial Economics 79, 99–144.

Ayyagari, M., Gopalan, R., Yerramilli, V., 2013. Insider Ownership and Shareholder Value: Evidence from New Project Announcements. Unpublished Working Paper .

Bertrand, M., Mehta, P., Mullainathan, S., 2002. Ferreting out tunneling: An application to Indian business groups. Quarterly Journal of Economics 117, 121–148.

Bubna, A., Prabhala, N., 2013. Anchor investors in ipos. Unpublished Working Paper .

Bubna, A., Prabhala, N. R., 2011. IPOs with and without allocation discretion: Empirical evidence. Journal of Financial Intermediation 20, 530 – 561.

Buchuk, D., Larrain, B., Muñoz, F., Urzúa I, F., 2014. The internal capital markets of business groups: Evidence from intra-group loans. Journal of Financial Economics .

Byun, H.-Y., Choi, S., Hwang, L.-S., Kim, R. G., 2013. Business group affiliation, ownership structure, and the cost of debt. Journal of Corporate Finance 23, 311–331.

Chakrabarti, R., 2008. Bond markets in India. Unpublished Working Paper, Indian School of Business .

Colpan, A., Hikino, T., Lincoln, J., 2010. The Oxford handbook of business groups. Oxford University Press.

Credit-Suisse, 2011. Asian family businesses outperform market indices. `https://infocus.credit-suisse.com/app/article/index.cfm?fuseaction=OpenArticle&aoid=322728&coid=263&lang=EN`, october 6, 2011. Retrieved on November 7, 2011.

Ferris, S., Kim, K., Kitsabunnarat, P., 2003. The costs (and benefits?) of diversified business groups: The case of Korean chaebols. Journal of Banking & Finance 27, 251–273.

Fisman, R., Khanna, T., 2004. Facilitating development: The role of business groups. World Development 32, 609–628.

Gopalan, R., Nanda, V., Seru, A., 2007. Affiliated firms and financial support: Evidence from Indian business groups. Journal of Financial economics 86, 759–795.

Granovetter, M., 1995. Coase revisited: Business groups in the modern economy. Industrial and corporate change 4, 93–130.

Guillen, M. F., 2000. Business groups in emerging economies: A resource-based view. Academy of Management Journal pp. 362–380.

Jiang, G., Lee, C., Yue, H., 2010. Tunneling through intercorporate loans: The china experience. Journal of Financial Economics 98, 1–20.

Kali, R., Sarkar, J., 2011. Diversification and tunneling: Evidence from Indian business groups. Journal of Comparative Economics 39, 349–367.

Khan, H., 2012. Towards Vibrant Debt Markets. `http://rbidocs.rbi.org.in/rdocs/Speeches/PDFs/FIMMDA270112.pdf`, retrieved on May 5, 2014.

Khanna, T., 2000. Business groups and social welfare in emerging markets: Existing evidence and unanswered questions. European Economic Review 44, 748–761.

Khanna, T., Yafeh, Y., 2005. Business groups and risk sharing around the world. The Journal of Business 78.

Khanna, T., Yafeh, Y., 2007. Business groups in emerging markets: Paragons or parasites? Journal of Economic Literature pp. 331–372.

Khanna, V., Varottil, U., 2012. Developing the Market for Corporate Bonds in India. Unpublished Working Paper, NSE .

Lin, C., Ma, Y., Malatesta, P., Xuan, Y., 2011. Ownership structure and the cost of corporate borrowing. Journal of Financial Economics 100, 1–23.

Morck, R., 2005. How to eliminate pyramidal business groups: The double taxation of intercorporate dividends and other incisive uses of tax policy. In: *Tax Policy and the Economy, Volume 19*, MIT Press, pp. 135–179.

Morck, R., Wolfenzon, D., Yeung, B., 2005. Corporate governance, economic entrenchment and growth. Journal of Economic Literature 43, 655–720.

Nath, G., 2012. Indian Corporate Bonds Market An Analytical Prospective. Unpublished Working Paper .

Seth, A., Marisetty, V., 2010. Emerging markets and business group effects: an empirical analysis of corporate acquisition decisions in India. Unpublished Working Paper .

Siegel, J., Choudhury, P., 2012. A reexamination of tunneling and business groups: New data and new methods. Review of Financial Studies 25, 1763–1798.

Table 1 : Descriptive statistics of bond issues

Panel A: Distribution of issues by industry

Industry	No. of issues	Percentage
Manufacturing	233	64%
Construction and real estate	58	16%
Information and communication	19	5%
Transportation	14	4%
Other industries	39	11%
TOTAL	**363**	**100%**

Panel B: Distribution of issues by rating level

Rating level	No. of issues	Percentage
AAA	67	18%
AA+	48	13%
AA	103	28%
AA-	57	16%
A+	46	13%
A	36	10%
Below A	6	2%
TOTAL	**363**	**100%**

This table presents the distribution of bond issues by industry and rating level.

Table 2 : Descriptive statistics of regression sample

Variable	Mean			Median		
	SA firms	BG firms		SA firms	BG firms	
Credit spread	4.102	2.602	***	3.880	2.192	***
Rating	15.962	17.977	***	16.000	18.000	***
Leverage	0.428	0.342	***	0.418	0.338	***
Tangibility	0.312	0.336		0.294	0.334	
Issue size (log)	5.859	6.515	***	6.049	6.380	***
Profitability	0.086	0.017		0.068	0.055	*
Maturity (years)	5.173	5.704		5.000	5.000	
No. of observations	52	311		52	311	

This table presents the means and medians for the variables in the regression sample. The significance stars denote that the means/medians of the variables differ substantially between Business Group (BG) and Standalone (SA) firms. See Appendix-A for variable definitions. *p<0.10 ; **p<0.05 ; ***p<0.01.

Table 3 : Correlation matrix

	Credit spread	BG dummy	Rating	Leverage	Tangibility	Issue size (log)	Profitability
BG dummy	**-0.308**						
Rating	**-0.564**	**0.405**					
Leverage	**0.212**	**-0.210**	**-0.306**				
Tangibility	**-0.230**	0.046	**0.157**	**0.198**			
Issue size (log)	-0.056	**0.211**	**0.288**	-0.030	**-0.092**		
Profitability	0.029	-0.030	-0.002	**-0.096**	0.053	-0.018	
Maturity (years)	-0.068	0.075	0.076	-0.028	**0.127**	**0.304**	0.048

This table presents the correlation matrix for the regression sample. Correlations significant at the 10% level are in boldface

Table 4 : Regression results for Models M1 and M2

	M1	M2
BG dummy	-0.281 *	
	[1.73]	
Rating	-0.569 ***	-0.535 ***
	[12.63]	[9.30]
Issue size (log)	0.081	0.057
	[1.30]	[0.73]
Maturity (years)	-0.052 ***	-0.047 **
	[2.66]	[2.01]
Leverage	1.029 ***	1.124 **
	[2.75]	[2.11]
Tangibility	-0.371	-0.899 **
	[1.14]	[2.26]
Profitability	0.025	-0.365
	[1.20]	[0.26]
Net Group Assets (log)		0.020
		[0.74]
Group Entropy		-0.068
		[0.52]
Constant	13.328 ***	12.374 ***
	[15.87]	[10.88]
Adjusted R-square	68.20%	62.10%
No. of observations	363	264
F-stat	31.0	29.0
p-value	0.00	0.00

This table presents the regression results for Models M1 and M2 based on OLS estimation. The dependant variable is bond credit spread (expressed as a percentage). Industry and year fixed effects are included in both models. Issue size and Net Group Assets are transformed into natural log forms on account of their wide dispersion and to control for possible heteroskedasticity. t-statistics presented in brackets are based on robust standard errors to correct for heteroskedasticity and adjusted for clustering at the firm level. See Appendix-A for variable definitions. *p<0.10 ; **p<0.05 ; ***p<0.01.

Table 5 : Descriptive statistics for HCFR and LCFR firms

Variable name	Means			Medians		
	HCFR firms	LCFR firms		HCFR firms	LCFR firms	
N	50	140		50	140	
Credit spread	2.481	2.538		2.290	2.147	
Rating	17.960	18.121		18.000	18.000	
Leverage	0.338	0.346		0.320	0.338	
Tangibility	0.409	0.347	***	0.409	0.357	**
Issue size (log)	6.333	6.608		6.157	6.452	*
Profitability	0.084	0.063	**	0.087	0.054	**
Maturity (years)	6.060	5.957		5.000	5.000	

This table presents the means and medians of the variables in the regression sample for High Cash Flow Right (HCFR) and Low Cash Flow Right (LCFR) firms. The significance stars denote that the means/medians of the variables differ significantly between HCFR and LCFR firms. See Appendix-A for variable definitions. *p<0.10 ; **p<0.05 ; ***p<0.01.

Table 6 : Regression results for Models M3, M4 and M5

	M3	M3 (75p)	M4	M4 (75p)	M5
LCFR dummy (only BG)	0.109	0.039			
	[0.53]	[0.17]			
LCF_BG dummy			-0.324	-0.398 **	
			[1.47]	[2.01]	
HCF_BG dummy			-0.467 **	-0.463 **	
			[2.11]	[1.99]	
Group rating					-0.234 *
					[1.89]
Rating	-0.500 ***	-0.546 ***	-0.518 ***	-0.548 ***	-0.532 ***
	[5.90]	[6.97]	[6.67]	[7.84]	[5.95]
Issue size (log)	0.056	0.150 *	0.003	0.064	0.137
	[0.60]	[1.72]	[0.03]	[0.82]	[1.40]
Maturity (years)	-0.040	-0.053 *	-0.047 *	-0.058 **	-0.070 **
	[1.34]	[1.91]	[1.75]	[2.19]	[2.25]
Leverage	2.222 ***	1.728 ***	1.160 *	0.992 *	1.711 *
	[2.83]	[2.88]	[1.92]	[1.93]	[1.84]
Tangibility	-0.925	-1.139 **	-0.443	-0.563	-1.145 *
	[1.58]	[2.03]	[0.91]	[1.20]	[1.88]
Profitability	1.783	-0.717	0.359	-0.617	-0.250
	[1.13]	[0.47]	[0.37]	[0.62]	[0.16]
Constant	11.272 ***	11.648 ***	12.747 ***	12.96 ***	12.914 ***
	[6.35]	[7.77]	[8.84]	[10.07]	[6.67]
Adjusted R-square	51.30%	56.50%	61.00%	63.20%	64.50%
No. of observations	190	209	242	261	113
F-stat	24.0	25.0	26.0	28.0	66.0
p-value	0.00	0.00	0.00	0.00	0.00

This table presents the regression results for Models M3, M4 and M5 based on OLS estimation. The dependant variable is bond credit spread (expressed as a percentage). Industry and year fixed effects are included in all models. Issue size is transformed into natural log form on account of its wide dispersion and to control for possible heteroskedasticity. t-statistics presented in brackets are based on robust standard errors to correct for heteroskedasticity and adjusted for clustering at the firm level. See Appendix-A for variable definitions. *p<0.10 ; **p<0.05 ; ***p<0.01.