The Role of Secured Debt in Resolving Agency Conflicts and Problems of Asymmetric Information: Indian Evidence

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Abstract:

The determinants of corporate indebtedness have been one of the most debated issues in empirical corporate finance research. In the Indian context, a number of research papers focusing on the said issue emerged since the 1990s. These research studies classified borrowing (the explained variable) based on the time perspective, namely, long-term and short-term. While this temporal categorization of borrowed capital remains important in analyzing capital structure choice, an alternative categorization based on whether borrowing is collateralized (secured) or not, has remained off focus. Consequently, the role of secured debt in addressing agency issues and problems of asymmetric information has remained largely unexplored. This exploratory research paper aims at addressing this issue, using a sample of manufacturing firms listed in the BSE 500 and SNP CNX 500 index.

Introduction

The determinants of corporate indebtedness have been one of the most debated issues in empirical corporate finance research. In the Indian context, a number of research papers focusing on the said issue emerged since the 1990s, (see Kakani 1999, Bhaduri 2002, 2002a, Guha-Khasnobis and Bhaduri 2002, Mahakud and Bhole 2003, Bhole and Mahakud 2004, Mahakud 2006). These research studies classified borrowing (the explained/dependent variable) based on the time perspective, namely, long-term and short-term. While the temporal categorization of borrowed capital remains important in analyzing capital structure choice, an alternative categorization based on whether borrowing is collateralized (secured) or not, has remained off focus. Consequently, the role of secured debt in addressing agency issues and problems of asymmetric information has remained largely unexplored; we do not know whether and to what extent borrowers use collateral to signal project quality, or whether observably risky borrowers pledge more collateral to secure financing. We are also not aware of whether secured debt market discriminates firms in terms of its size.

In attempting to fill up this gap in existing literature, this paper is expected to contribute to our understanding of the role of secured debt market as an institution for corporate financing in India and its stage of development, and also provide critical inputs necessary for initiating reforms in this segment of the market so as to further its role as an intermediary institution.

The paper is organized as follows; the next section focuses on the available literature on secured borrowing and identifies the probable influencers of secured borrowing. This is followed by a description of the methodology adopted in the paper, including sample selection, data source, variable definition and statistical model. We present the findings of the research in the next section along with their interpretation. The last section identifies the limitations of the paper, before concluding.

A Review of Available Evidence

Harris and Raviv (1991) identified four categories of determinants of capital structure. In their words, 'these are the desire to

- ameliorate conflicts of interest among various groups with claims to the firm's resources, including managers (the agency approach),

- convey private information to capital markets or mitigate adverse selection effects (the asymmetric information approach),
- influence the nature of products or competition in the product/input market, or
- affect the outcome of corporate control contests.'

From the relevance perspective, this paper focuses upon the first two categories of determinants addressing the agency and asymmetric information issues. We discuss each of these approaches and the role of secured debt in this regard.

Existing literature on agency issues categorize conflicts of interests among a firm's claimants in two broad categories. First, is the conflict between shareholders and managers and, second, between shareholders and lenders. The former arises primarily from the asymmetry of efforts and rewards that exists between the principal (shareholders) and managers (as agents of the principal), while the later arises because of the asymmetry of claims that shareholders and lenders have on the outcome of an investment. In the later case, if an investment produces large returns, shareholders capture most of the gains; in failure limited liability of equity shareholders ensures that debt holders bear the loss. Consequently, shareholders stand a chance to benefit from a risky project that the firm undertakes, even if it is value decreasing. Such investments reduce the value of debt (a rise in perceived risk diminishes value), while for equity, their loss in value as a consequence of poor investment can be more than offset by the gain in value captured at the expense of debt holders.

One possible way lenders may insure against risk shifting practice is through bond indentures. Alternatively, they may seek collateral as security against which finances are raised. Collateralized or secured debt refers to debt backed by a specific charge created on the fixed assets of the issuer company, ensuring that in bankruptcy these assets can be sold to repay the investors; the purchaser essentially transfers financial risk to the seller of the instrument, and given the security of a collateral and preferential treatment with regard to repayment in case of liquidation, cost of secured debt is lower. Secured debt however has its own costs as observed in Stulz and Johnson (1985) and Igawa and Kantas (1990). The former identified that pledging an asset as collateral against loan, led to a loss of flexibility on the part of the company with regard to use and liquidity of the asset,

while the later discussed how collateralized borrowing resulted in moral hazard involving the borrower's use of pledged assets, in so far as maintaining its value is concerned.

While we do not know whether the benefits of secured debt outweigh the costs, or otherwise in the Indian context, available empirical evidence on the positive relationship between tangibility of assets and long-term borrowing, allows us to incorporate this factor as an independent variable in our analysis; a necessary, if not sufficient condition for access and use of secured debt. This off course presupposes a certain stage of development in the market for collateralized borrowing.

The asymmetric information based explanation of capital structure choice is based on the assumption that the insiders of a firm have access to information that outsiders do not have. In these sets of models the choice of capital structure addresses the problems of over- and under-investment (Myers and Majluf, 1984), while its dynamics (changing debt-equity ratio) conveys private information to the outsiders (Ross, 1977). Myers (1977) asserts that the problems of asymmetric information in general and over/under-investment in particular are most critical for firms whose value consists primarily of intangible investment opportunities or growth options and consequently, growing firms tend to shy away from debt. Secured debt in the context of growing firms can be a potential solution to this problem. To the extent the financial markets view borrowers use of collateral as a credible signal of project quality (Bester, 1985; Chan and Kantas, 1985), pledging a collateral enables these firms to raise finance, and since assets pledged as collateral cannot be disposed of easily, secured debt lowers total costs of borrowing by limiting asset substitution opportunities. This lower cost of collateralized borrowing also enables the firm to undertake projects that it would have otherwise foregone if normal (unsecured) debt were the lone financing possibility. Consequently one would expect a direct relationship between firm growth opportunities and the use of secured debt in financing.

Another potential determinant of secured debt ratio relate to the possibility of bankruptcy of a firm. Theoretically firms with lower possibility of bankruptcy are better equipped to issue secured debt compared to other firms and hence an inverse relation between possibility of bankruptcy and secured debt issue may be hypothesized. This has been observed in Bester (1985), and Chan and Kantas (1985). Recent literature on the said

issue however provides evidence contrary to the above findings; Leeth and Scott (1989) observed that that the probability of using secured loan is directly related to the likelihood of default, and Inderst and Muller (2007) observed that while borrowers who could pledge more collateral were more likely to obtain credit, observably risky borrowers faced higher collateral requirements. The study also observed that after controlling for observable borrowers risk, collateralized loans were more likely to default *ex post*. Given these contradictory findings, it appears that the verdict on firm risk and secured debt ratio is still at large.

Does firm size and age influence secured debt ratio? We do not know. While available empirical evidence in Kale, Neo and Ramirez (1991), Rajan and Zingales (1995) and Bevan and Danbolt (2004), point towards a positive association between firm size and indebtedness, and Majumdar (2010) observed a positive association between debt maturity and size, we do not know whether larger sized firms employ a higher proportion of secured or whether they leverage their lower probability of default (Rajan and Zingales, 1995) to employ more unsecured debt.

Diamond (1989) observed that a firm's reputation has an important influence in mitigating conflicts of interest between borrowers and lenders. While reputation in the product market stems from product, market and technological knowledge, in the input market it emanates from relationships with suppliers of raw materials and the firm's own credit history (in terms of debt repayment and servicing). A firm that is low in reputation has incentives in selecting excessively risky projects to benefit shareholders at the expense of lenders. A reputed firm on the other hand would refrain from such risk shifting behavior, given that it might endanger an intangible asset that has taken years to build. While it is difficult to measure an intangible, like reputation, the number of years a firm is in business appears to be a close proxy for the same. Does firm age favorably affect information asymmetry and reduce the incidence of secured debt? Or does young firms take recourse to secured debt, given the absence of the reputation asset for them in the market?

This exploratory study analyzes the impact of these independent variables, namely, tangibility, growth opportunities, firm risk, firm size and age of the firm on the

proportion of secured debt employed in its capital structure. The exact definitions of the variables mentioned above are detailed in Appendix I.

Methodology

The population for our empirical study include the universe of manufacturing firms in India. From this population we focus on those manufacturing firms listed in the BSE 500 and S&P CNX 500 index. These two indices (with considerable overlaps in their constitution) are the largest professionally managed indices of listed stocks in the country and consists of large cap, mid cap and small cap stocks that make it a more representative sample compared to any other smaller indices. From this sample, we select companies for which financial information on all the variables used in this research are available over the period 2004-05 to 2008-09, and cash flow statistics are available for the period 2000-01 to 2008-09. Consequently the sample size stood at 194 resulting in 970 observations. The financial data necessary for the research is obtained from the database PROWESS of the Centre for Monitoring the Indian Economy.

This paper employs panel data regression model as a statistical tool for analysis. Panel or longitudinal data refers to data containing time series observations of a number of individual units. Observations in panel data involve at least two dimensions; a cross sectional dimension and a time series dimension. For instance, secured debt ratio of a firm i in a sample of j firms represent the cross sectional dimension, while the same ratio over time for the same firm, denoted by t, represent the time series dimension. More than two dimensions represent more complicated clustering or hierarchical structures. Extending the above illustration, two more dimensions may be added by including a country and a sector dimension. The key feature of panel data that distinguishes it from pooled cross section is that the same cross sectional units are followed over a given period of time.

Ever since Balestra and Nerlove (1966) paper on pooling cross-section and time series data was published, there has been phenomenal progress in applied studies and methodological development of new econometric tools of panel data. A primary reason behind the increasing popularity of panel data models stems from its greater capacity of modeling complex behavior compared to single cross-sectional or time series data alone. Baltagi B H and Griffin J M (1988), Wooldridge (1999), Baltagi (2008), Hsiao and

Yanun (2006), discusses the reasons behind the growing popularity of this data structure. In particular, panel data models provide major benefits for econometric estimation in controlling for individual heterogeneity, eliminating or reducing estimation bias and reducing the problems of data multicollinearity. These advantages of panel data provide the basic motivation behind the choice of this regression model.

The regression equations we test take the following form:

$$(\text{Secured Debt Ratio})_{i,t} = \alpha_{i,t} + \beta_1(\text{Tangibility})_{i,t} + \beta_2(\text{Growth})_{i,t} + \beta_3(\text{Risk})_{i,t} + \beta_4(\text{Size})_{i,t} + \beta_5(\text{Age})_{i,t} + \xi_{i,t} \dots\dots\dots\dots\dots\dots\dots.(i)$$

where subscript i denotes the ith firm, and t refers to time (here year of observation) and β denotes the unknown parameters of interest. Before testing the above mentioned hypothesis using the above panel data, the Likelihood Ratio (LR) test, Lagrange Multiplier (LM) test and Hausman specification tests are carried out for the sample of firms to know the significance of firm and time effects in the data set, and to find out a suitable panel data method for the estimation of the model. For the estimation equation, the overall F-Statistic and its statistical significance, along with R-squared value is used to judge its relevance and sufficiency. The statistical significance and the sign of coefficients associated with each of the independent variables are used to draw inferences about the factors affecting secured debt ratio.

Findings and Analysis

The summary statistics of the independent variables are presented in Table 1, depicting heterogeneity of the sample and hence its representative nature. Table 2 shows the

Table 1: Summary Statistic of Independent and Dependent Variables (Sample size 970)

Variables	Mean	Std. Dev.
Secured debt ratio	0.1729	0.1536
Tangibility	0.3519	0.1881
Growth	2.1843	1.5558
Risk	0.4772	0.5130
Size	7.4892	1.2879
Age	3.4639	0.6882

correlations between the variables selected in the model. Note that secured debt ratio is positively correlated to tangibility and inversely correlated to firm growth opportunities. Another variable that exhibit strong inverse correlation appears to be firm age, implying that higher the age of the firm lower is the secured debt ratio. The correlation between risk and secured debt ratio is positive but small. Table 2 also shows correlations between the independent variables considered in the model are sufficiently small to create problems of multicollinearity.

Table 2: Correlation Matrix of Independent Variables

	SD_TA	Tangibility	Growth	Risk	Size	Age
Tangibility	0.46	1				
Growth	-0.36	-0.26	1			
Risk	0.08	-0.01	-0.02	1		
Size	-0.16	0.08	-0.06	-0.05	1	
Age	-0.34	-0.10	0.10	-0.13	0.21	1

Table 3 shows that the null hypothesis H_0^1: $\sigma_\mu^2 = 0$ and H_0^2; $\sigma_\mu^2 = \sigma_\lambda^2 = 0$ are rejected. Clearly, the LR test result shows that both the firm and time effects are present in the data. Lagrange Multiplier test statistics presented in the tables indicate that either the fixed effect or random effect panel data models are to be preferred to the classical linear regression model. The statistically significant Hausman specification test results favour the use of fixed effects model over the random effects model. Consequently Table 4 present the regression results of both the fixed effects firm and fixed effects firm and time models, respectively.

Table 3: Likelihood Ratio (LR) Test, Lagrange Multiplier (LM) Test and Hausman Test Results for the period 2004-2005 to 2008-2009 for Secured Borrowing

Tests	Test Statistics	P-Values	Test Statistics	P-Values
LR Test	$\chi^2(193) = 1439.32$	0.000	$\chi^2(198) = 1446.47$	0.000
LM Test	$\chi^2(1) = 928.11$	0.000	$\chi^2(2) = 928.35$	0.000
Hausman Test	$\chi^2(5) = 25.53$	0.000	$\chi^2(5) = 29.43$	0.000

Regression results from Table 4 show tangibility, growth opportunities and firm size as statistically significant variables affecting secured debt ratio in both the models. The F-statistic validates the statistical significance of the regression equation. The explanatory powers of the models are given by the r-squared values.

Table 4: Results of Regression – Secured Borrowings

Variables	Model 1	Model 2
Constant	--------	0.1032(0.1399)
Tangibility	0.2072(0.0357)*	0.1941(0.0361)*
Growth Prospect	-0.0069(0.0024)*	-0.0072(0.0028)**
Risk	-0.0005(0.0005)	-0.0004(0.0055)
Size	-0.0252(0.01076)*	-0.0142(0.0092)**
Age	-0.0036(0.0343)	0.0036(0.0392)
N	970	970
Adjusted R^2	0.8241	0.8243
F-Test Result	23.94*	23.39*

Note –

(i)   Model 1 refers to the Fixed Effect Firm Model and Model 2 refers to the Fixed Effect Firm and Time Model

(ii)   The fixed effect model does not have an intercept term

(iii)   The figures in parenthesis alongside the coefficients show the standard errors

(iv)   *, **, *** Represent the 1%, 5% and 10 % level of significance respectively

As can be seen secured debt ratio vary directly with the tangibility of a firm's assets (in both the fixed effect firm and fixed effect firm and time model), implying that the incidence of secured borrowing increases with the firm's capacity to pledge collateral. While we are not in a position to comment on the rate of growth of secured debt vis-à-vis incremental rise in tangibility, our evidence suggests that the benefits of using secured debt outweighs its costs, and hence the positive relation.

Findings with regard to growth indicate an inverse relation between growth opportunities and secured debt ratio in case of both the models. While this may be contrary to our

expectations, there may be multiple rationales behind this observation. Given an inverse relation between growth opportunities and indebtedness (in the Indian context) (Majumdar, 2010), an inverse relation between the former and secured debt ratio may be interpreted as a general tendency of growth firms to avoid debt markets. Second, financing deficit in the face of asymmetric information, limited collateralizable capacity and transaction costs (involved in debt issue) may compel these firms to take recourse to unsecured borrowings from banks and other financial institutions. Third, the observations of Bester (1985) and Chan and Kantas (1985) on collateral as a credible signal for project quality may not be a valid proposition in the Indian context, that is, growth firms may not be in a position to garner financing even against collateral. This may be an outcome of the under-developed nature of the secured debt market (and the legal and administrative complications involved in compensating the lender in the event of bankruptcy). Last but not in the least, a still further rationale of the inverse relationship stem from the arguments of Stulz and Johnson (1985) (with regard to loss of loss of flexibility on the part of the company with regard to the use and liquidity of the asset) or Igawa and Kantas (1990) (who observed that collateralized borrowing might result in moral hazard involving the borrower's use of pledged assets, in so far as maintaining its value is concerned).

Another important result of this research is the inverse relationship between secured debt ratio and firm size; our evidence suggests that the incidence of secured debt declines with increase in firm size. Rajan and Zingales (1995) argument that larger firms tended to be more diversified and hence failed less often, may not be entirely tenable in this context given the statistically insignificant relationship between risk and secured debt ratio. An alternative explanation may be based on growth stage of these large sized firms and internal resource generating capacity vis-à-vis financing requirement in general and the relative unattractiveness of debt financing in particular (the presence of large depreciation tax shields might impair the attractiveness of interest tax shield). Further to this, Sullivan (1978) observed that a powerful firm, (i.e., a large firm and/or a firm in a concentrated industry), seemed to be confronted by lower costs to attract capital than a non-powerful firm, i.e., a smaller firm and/or a firm in an un-concentrated industry. And to the extent size and public visibility are directly related (and hence information asymmetry reduced),

the problem of undervaluation associated with equity financing may be eased and the signaling capacity of secured debt may not be of much useful value.

Findings with regard to the variable, risk, suggests that the use of secured debt decreases with volatility of earnings before interest, depreciation and taxes; the results however are not statistically significant. Consequently we are unable to validate (or otherwise) the findings of Bester (1985), and Chan and Kantas (1985) on the relationship between risk and secured debt use in the Indian context. With regard to age, our findings are mixed (inverse in case of Model 1 and direct in case of model 2) and statistically insignificant (in both cases). Consequently, we conclude that the impact of age on the use of secured and unsecured debt is at best ambiguous.

Conclusion

This paper tests empirically the role of secured debt in secured debt in addressing agency issues and problems of asymmetric information using a sample of listed manufacturing firms from the BSE 500 and S&P CNX 500 index. While we find some evidence for the former (tangibility and the use of secured debt are directly related), the role of secured debt in case of the later does not stand in line with the literature cited above. Specifically, the inverse relationship between firm growth opportunities and secured borrowing, as observed in this case, may be an outcome of institutional deficiencies pertaining to the secured debt market. Our findings concerning firm size and its inverse relationship with secured debt ratio also calls for further research on the linkages (if any) between financing choice and firm size. This research could not reach any definite conclusion on the impact of risk and firm age on secured borrowing.

The paper suffers from certain limitations. First, the size of the sample used is small compared to the universe of listed manufacturing firms in Indian stock markets, keeping in mind issues on data availability. Similar considerations have also shortened the period of analysis to only 5 years. Second, this paper does not consider the components of secured debt that firms of different size, product category and market structure engage in optimizing their capital cost. Bringing these issues into consideration is one possible agenda for future research on Indian corporate indebtedness.

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Appendix 1

Dependent Variable:

- Secured Debt Ratio: $\dfrac{Secured\ Debt}{Total\ Assets}$

Where secured debt includes secured bank borrowings, secured financial institutional borrowings, secured borrowings syndicated across banks & institutions, hire purchase loans, secured deferred credit, secured domestic supplier's credit, debentures/ bonds, non-convertible debentures/ bonds, zero interest bonds, convertible debentures, optionally convertible debentures/bonds, convertible warrants, convertible warrants - of which redeemable in the current year, secured foreign currency borrowings, secured foreign suppliers' credit, loans from promoters /directors/shareholders (individuals), secured inter-corporate loans, secured loans from subsidiary companies, loans from group/assoc. business enterprises, secured loans from other business enterprises

Independent Variable:

- Tangibility: $\dfrac{Net\ Fixed\ Assets(NFA)}{Total\ Assets(TA)}$

- Growth Prospects:

$$\dfrac{Total\ Assets(TA) - Book\ Value\ of\ Equity(BVE) + Market\ Value\ of\ Equity(MVE)}{Total\ Assets(TA)}$$

- Risk: $\dfrac{St.Dev(EBDIT)_{t,t-5}}{Mean\,(EBDIT)_{t,t-5}}$

- Firm Size: $\ln(Sales)$

- Firm Age: $\ln(\,Number\ of\ Years\ Since\ Incorporation\,)$