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The Corporate Debt Market

A Firm-Level Panel Study for India

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Abstract

Traditionally, firms in India have shown a low preference towards debt financing, despite its advantages. Using panel data from 450 firms during 1992-93 and 2003-04, we attempt to identify factors which could explain the pattern of financing of manufacturing firms in India and the key determinants of their debt structure. We examine the roles of age of the firm, long term borrowing and net sales in affecting its debt structure.

Keywords: corporate debt, leverage, manufacturing firms, panel data, India

JEL classification: C51, G11, G 31, G32

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1 Introduction and brief literature review

The pattern of economic development adopted by India was essentially based on centralized planning with a predominant role played by the public sector, in the absence of sufficiently developed corporate industrial and banking systems as well as an efficient market system to foster growth of secondary and tertiary activities. While there had been some private initiatives in the industrial scene, participation of private banks and institutions in the financial market was dismal. Public sector banks and financial institutions accounted for nearly 75-80 per cent of financial intermediation in India. At this point, the process of economic development in India crucially hinged on captive investments in government securities by the public financial institutions, and on direct lending to the public sector units following recommendations of the Reserve Bank of India (RBI). Rates of interest on government debt were administered and the rate of interest on central bank financing was hugely subsidized. At the same time, exposure to foreign capital was limited.

Over-reliance on public sector financial intermediation largely hindered the growth of both equity and debt markets for corporate financing in India. Since the early 1990s, however, significant structural changes in the Indian capital market, particularly in the equity market, have enhanced Indian firms' flexibility in choosing their capital structure optimally. Despite such changes, the corporate debt market in India, as in many other developing countries, has not developed sufficiently. In this context, one must also take note of the fact that debt instruments, ranging from fixed deposits, debentures to convertible debentures and so on, are considered to be cheaper sources of finance in view of the tax advantage on interest payments. Given this perspective, in this paper, we intend to empirically investigate an important question that has critical bearing on the performance of the financial system in India and yet not dealt with in the literature so far. As an analytical prelude, we first focus on the macroeconomic and institutional prerequisites necessary for the development of a sound domestic debt market in India, particularly the development of the primary and secondary debt markets, and subsequently explain why the volume of trade is meagre in the secondary market. We then test for the pattern of debt-equity choice by Indian firms during the post financial liberalization period in India and identify several factors that may have strong influence on a firm's choice of participation in the corporate debt market. This should provide adequate inferences to researchers and policymakers interested in understanding the lopsided performance of the Indian corporate debt market and focusing on the underlying factors that might eventually correct the distortions, if any exist.

A segment of the financial market, which has for long remained almost completely unregulated and therefore highly risky, is the non-government bond market. Although the volumes in this market have been growing steadily, the development of the market continues to be lopsided. Especially, the secondary market continues to lack liquidity although the volumes of primary issues have grown exponentially. Almost all the issues in this non-government securities market (in other words, corporate bond market) are by way of private placements. While the aggregate value of primary issues in corporate debt grew from about Rs.120 billion in 1995-96 to Rs.530 billion in 2002-03 the

proportion of issues through the public issue route declined from 22.6 per cent of the total issues in 1995-96 to 8.8 per cent of the total in 2002-03.[1]

Under the circumstances, issuers have increasingly preferred to resort to the private placement mechanism rather than transparent public issue route. However, there seems to be no reliable estimates of the outstanding stock of privately placed debt. By alternative measurements, the total outstanding stock of privately placed corporate bonds is estimated at around Rs.2000 billion. By any reasonable standards this is a fairly large market and problems in such a market can easily have destabilizing effects of a serious nature to the entire financial sector.

Traditionally, the debt market has been an institutional market all over the world. Banks and financial institutions contribute more in terms of trading volume. Many of these investors are also issuers of debt instruments. The small number of large players has resulted in the debt markets being fairly concentrated and evolving into a wholesale and negotiated dealings market. Most of the debt issues are privately placed or auctioned to participants. Secondary market transactions take place through telephonic negotiations among the market participants.

It might be instructive at this stage to delineate that the relative trading intensity in the corporate bond market in India is also much smaller than in the case of government securities or equities. The daily secondary market trading in the corporate bonds is placed around Rs.3-4 billion although since early November 2003 the volumes have fallen significantly after the new regulations imposed by the Security and Exchange Board of India (SEBI), according to which, disclosures need to be made at the time of issuing the bond and during subsequent trading on the exchanges. This is accompanied by the RBI's new regulations on investments in non-statutory liquidity ratio (SLR) instruments/securities by banks. The relatively low trading intensity in corporate debt instruments is also indicative of the fact that this market is relatively underdeveloped and suffers from some infirmities.

Generally speaking, the trading intensity in the debt market around the world is always significantly higher than that of the equities, owing to a number of reasons. It is established that bonds are bought and sold by the investors for basically two reasons. The first motive for trade is to deploy funds in safe and remunerative fixed income instruments keeping in view their relative risk–reward nature. Debt oriented mutual funds, for example, invest in bonds to offer a reasonable rate of return for those who invest in the debt mutual funds. Such mutual funds trade in bonds whenever they need to reshuffle their portfolios or have to meet redemption demand from the investors. The open-ended debt funds have to enter into buy/sell transactions depending on the inflow and outflow of investor funds. There are also long-term investors in bonds such as trusts or households in search of a steady rate of return on their investible surpluses. However, the much more important factor influencing secondary market transactions in bonds is the management of temporary or short-term liquidity. All those with fluctuating levels

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[1] For earlier work on the corporate debt market in India, see Mohan (2000), Thorat (2000, 2002), Leonardo (2000) and Patil (2004). For relations between financial liberalization and aggregate debt intensity, see Bhaduri (2000). Babu and Jain (2000) examine the significance of industry class in designing capital structure between debt-equity ratios. A cross-country analysis for the Asian countries is available in Harwood (2000).

of liquidity requirements prefer to invest temporarily idle funds in liquid bonds so that such funds earn a reasonable rate of return. A brief overview of the state of the corporate debt market, as it exists in India presently, is provided below.

Now, the debt market in India comprises of two main segments: government securities market and corporate securities market. It is the former that dominates the market in terms of outstanding issues, market capitalization and trading volume; it sets the benchmark for the rest of the market. The main instruments in the government securities market are dated securities that include floating rate bonds, zero-coupon bonds, securities with embedded derivatives, and treasury bills and state government bonds. The corporate debt segment includes private corporate debt: debentures, fixed deposits, commercial papers, bonds issued by public sector units, infrastructure-related institutions, and bonds issued by development financial institutions. During 2002-03 the total amount raised through primary issues in the debt market stood at Rs.2,350,956 million, which is an increase of 15 per cent over the previous year (see Table 1). Out of this 77.4 per cent was raised by the government while the rest was raised by the corporate sector through public and private placements.

The government securities form the oldest and the most dominant segment of the debt market in India. The major investors of the government securities are the banks, the insurance companies, primary dealers and financial institutions. Historically the banks and other financial institutions were forced to invest in government securities due to SLR. In this way a captive market for government securities emerged that helped the government to appropriate a sizable amount of funds at a very low rate of interest. In the post reform period (i.e. since 1991) a number of measures taken, notably a market-determined rate of interest, have totally reversed the scenario. As a matter of fact, the banking sector presently invests by 12 per cent more in government securities over and above the SLR requirement, which now stands at 25 per cent.

Apart from the central and state government securities, various public sector units, development financial institute and the infrastructure related institutions also raise funds through bond issues. However, a major portion is raised through private placement. The major subscribers in this segment are banks, financial institutions and other corporates.

Table 1 Primary issues market (Rs. million)

Issuer	2001-02	2002-03
Government	1,525,080	1,819,790 (77%)
Corporate	515,610	531,166 (23%)
Total	2,040,690	2,350,956

Source: ISMR (2004)

Table 2 Turnover in secondary market (Rs. million)

Security	2001-02	2002-03
Government	1,5738,927	1,9557,312
Corporate	197,289	360,388
Total	15,936,216	19,917,700

Source: ISMR (2004)

It should also be noted that the Indian private corporate sector raises a large part of their financial requirements through bank loans. Other than this, they rely on debt issues, which comprises of bonds and commercial papers. Most of the bond issues are routed through private placement – around 93 per cent during 2003-03. It is argued that there are several inherent advantages of relying on private placement. It is both cost and time effective and is tailor-made to meet the needs of the investors in terms of interest payments and redemption. Moreover, it does not require detailed compliance with formalities as required for public and rights issues. The latter may be a source of many unscrupulous activities of the issuers. It is often commented that the private placement is crowding out public issues.

In recent times a number of innovations have taken place in the corporate bond market, such as securitized products, corporate bond strips and a variety of floating rate instruments with floors and caps and bonds with embedded put and call options. However the secondary market has not yet developed in the debt segment of the Indian capital market. As is evident from Table 2 the aggregate turnover in the secondary market rose by 25 per cent compared to that in the previous year, while the trade in corporate securities accounts for a meagre 1.81 per cent.

There is another, albeit less dominant, segment in the debt market, namely, short term paper issued by banks, mostly in the form of certificates of deposits. The Indian debt market also has a large, non-securitised, transactions-based segment comprising of call and notice money markets, an inter-bank market for term money, a market for inter-corporate loans and a market for ready forward deals (repos). The players in this market segment are able to lend and borrow amongst themselves.

Perhaps, the most important reason for lack of development of a healthy corporate bond market in India during the last decade appears to be unwillingness, until recently, on the part of the market regulator to play a proactive role in its development. After the securities scam hit the Indian financial markets in 1991-92, there have been several significant initiatives for upgrading the quality of the market, through development of infrastructure and the regulatory framework. These apply both to the equity market and the government securities market in India. However, despite such palpable attempts in related markets, the corporate debt market failed to attract sufficient attention from the market regulator, namely, the SEBI. The National Stock Exchange (NSE) on its part has attempted to encourage growth of the corporate debt market by providing the necessary trading and settlement infrastructure; but its efforts did not yield the desired results because there is no regulatory compulsion on the market intermediaries to direct their transactions to the exchange trading and settlement system.

As per the Securities Contracts Regulation Act 1956, the regulatory powers in respect of the equity markets (including equity-based derivatives) and corporate debt market vest fully with SEBI. While SEBI did take considerable interest in continually upgrading the quality of its regulatory and surveillance framework in respect of the equity and equity-based derivatives markets, it showed scant interest with regard to the corporate debt market. The first important circular issued by SEBI on market dealings in corporate bonds was on 14 September 1999 when it banned all negotiated deals in listed corporate debt securities and made it mandatory for all the members of stock exchanges to execute all deals in corporate bonds on the order matching screen of the stock exchanges just as in the case of equities.

However, SEBI failed to follow up its directive in ensuring that the corporate bond market becomes transparent and adopts an efficient price discovery process. Brokers evaded the SEBI directive by taking shelter under the guidelines regarding the spot deals (that is, deals taking place outside the stock exchanges), which are required to be settled in 48 hours and are outside the purview of the stock exchange regulations. Available data on transactions in corporate debt reported to NSE and the deals in corporate debt settled in National Securities Depository Ltd. (NSDL) indicate that only a small proportion of the deals are reported to the NSE. During the six month period January-July 2002 only about 27.7 per cent of the deals in corporate debt settled in NSDL were actually reported to NSE. What is more significant is that hardly any of these deals were actually matched on NSE's order matching system. Thus the SEBI directives were totally ignored by the market. Despite this SEBI did not deem fit to pull up concerned brokers or take any action against them. All these years, market players have been ignoring the SEBI directive for the simple reason that they did not anticipate any punitive action; there was a general impression in the market that SEBI itself was not serious about disciplining the secondary market in corporate debt.

In summary, therefore, existing deficiencies in the secondary debt market in India are as follows:

i) There are strong entry barriers to participate in trading of government securities. Like equity markets everybody should have access to market participation. Trades are negotiated bilaterally over telephones or by negotiated dealing settlements. The enforcement of such trades is difficult as they are in the nature of 'over the counter'.

ii) Another deficiency of the market is that the market as such has no liquidity. The parties have to search for counter parties and negotiate the best price. Though the NSE introduced automated screen based trading, which is an automated order matching system, the banks and the financial institutions (who are the major players) showed little interest. Regulatory fiat is needed to enforce transparency in financial deals. Anonymity in trading is a necessary condition for the market to function competitively. The knowledge of parties affects the terms of trade and can lead to cartel formation. The market is not transparent; only the parties who trade have information about the trade.

iii) Finally, and yet no less importantly, the market remains highly fragmented.

While these stated conditions prevail and necessitate need for further reforms, a host of reformatory policies had nonetheless been announced earlier. The reforms initiated by the RBI and the government of India in the debt market recently include:

- setting up of a comprehensive system of primary dealers,

- adoption of a Delivery Versus Payment (DVP) system for settlement of government securities transactions,

- abolition of tax deduction at source on government securities,

- permitting Foreign Institutional Investors (FIIs) to invest in debt instruments including government stock and allowing them to hedge their foreign currency risk in the forward market,

- introduction of Treasury bills of varying maturities, and

- placing investments of banks in preference shares/debentures/bonds of corporates outside the 5 per cent limit.

In a bid to increase transparency in operations, the RBI has been disseminating information on its transactions in gilts and publishing the calendar of auctions in respect of Treasury bills and repos. Soon, the RBI proposes to publish data on banks' investments in corporate and Public Sector Units (PSU) debt in the 'Weekly Statistical Supplement' to the *RBI Bulletin*. To foster inter-institutional coordination, a Technical Advisory Committee for government securities and a Standing Committee on Money Market have been set up. Major issues confronting the debt and money markets are discussed in these committees. These committees have been found to be useful by all participants.

Based on these specifications, we formulate the agenda for research and propose to investigate the following issues.

An econometric model for the financing pattern of Indian firms will be formulated with proximate determinants used for most other developing countries. In this context, competing theories for debt-equity choice of firms based on tax advantage of debt over equities and the pecking order theory *a la* Myers and Majluf (1984) can be tested. We will use a comprehensive database of Indian firms for the period 1992-93 to 2002-03 compiled by the Centre for Monitoring Indian Economy (CMIE).

It has been observed that the Indian corporate sector resorted to equity financing in a booming stock market between 1991 and 1995-96. Thereafter they rely more on debt, primarily in the form of bank loans, for financing their investment projects. However, they also raise money by means of other debt instruments such as debenture, fixed deposits and commercial papers. The latter has been popular in recent times particularly as a short-term debt instrument. The fact that firms resorted to equity financing in a booming stock market can be ascribed to the fact that in such situations firms can raise more funds with lesser dilution of the existing shareholding pattern. On the other hand, when the share market is low, firms prefer debt as the means of financing as equity becomes costlier in terms of the dilution of shares. Thus the firms take advantage of a positive 'bubble' in the stock market, if there be any, for financing its investment projects (see Chirinko and Schaller 2001). This does not support the pecking order hypothesis. However, this phenomenon will depend to a large extent on firm-specific characteristics in addition to the general stock market situation, because all firms cannot equally get the benefit of a booming stock market.

Based on the existing observations, we formulate an econometric model that addresses the issue of private versus public placement in the debt market. *Prima facie* it appears

that the firms envisage high transaction cost of public placement, which is further influenced by many firm-specific factors. It is further argued that one of the other reasons why firms prefer private placements is the lack of stringent disclosure norms associated with this form. Looking at the history of capital issues of firms for the period 1992-93 to 2002-03 we address this issue in an econometric model.

2 Data, model and results

First, we provide a brief discussion of the factors that determine a firm's capital structure, and that which we have used in the following econometric model. Modigliani and Miller (1958) earlier hypothesize that a firm's leverage is uncorrelated with its market value under a perfectly complete capital market. However, there is extensive literature explaining that each firm can have a different optimal capital structure minimizing capital cost in the real world, where there exist bankruptcy costs, agency costs, asymmetric information and incompleteness in product and factor markets.[2]

The determinants of debt structure given particular emphasis in earlier theoretical and empirical studies include firm size, growth rate, size of tangible fixed assets, profitability and industry classification.[3] In addition we also incorporate the age of the firm as calculated from its date of incorporation and whether it is listed either in the NSE or in the Bombay Stock Exchange (BSE). In fact, our empirical results are based on observations on 450 firms listed in either of these stock exchanges, during a period of 12 years between 1992 and 2003.

We propose two dependent variables in order to observe the effect of a set of explanatory variables on them, separately. The first one is termed DEBTINTO and calculated as the sum of Fixed Deposits, Commercial Papers and Debentures, which are elements of the total borrowing of a firm. The alternative dependent variable is more traditionally defined as Leverage and calculated as the ratio of Total Debt and Total Asset at the firm level. The purpose behind such alternative measures is to providing a more comprehensive analysis of the issue at hand: the determination of the corporate debt structure in India.

Description of the variables and the descriptive statistics

Tables 3–6 describe the panel data, which is extracted from the CMIE database. The data covers a period of 12 years, between 1992-2003 for 450 firms sorted from a group of 653 firms on the basis of listing information at the NSE and BSE. We next offer a description of the data, which includes detailed descriptive statistics (Table 3), a variance-covariance matrix (Table 4) and a correlation matrix (Table 5). Outcomes of the panel regression are provided later in Table (6) and a detailed description of the data given below.

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2 For recent survey papers on the theory of determination of optimal financial structure of firms, see Harris and Raviv (1991) and Rajan and Zingales (1995) also providing an empirical estimate.

3 Important empirical studies regarding the determinants of the firm's capital structure include, Bradley, Jarrell and Kim (1984), Titman and Wessels (1988), and Demirgüç-Kunt and Maksimovic (1994).

Table 3 Descriptive statistics

Variables	Mean	Std dev.	Skewness	Kurtosis	Minimum	Maximum	No. of obs
SHARE_PRI	103.305	266.794	13.1232	249.988	0.27	6876.06	5237
LOGSALES	2.06022	0.697816	-0.106934	3.75682	-1.69897	4.87178	5388
SALES_GR	18.4623	195.29	47.0849	2357.32	-96.0971	10585.7	4937
NETSALES	1.05347	0.534085	1.54642	9.39005	-0.00090886	5.84082	5388
NFATOTAA	0.432907	0.231221	1.97379	15.278	0.00570994	2.76407	5388
LONG_TER	127.815	577.437	14.3578	289.414	0	16780.2	5388
AGE	31.1414	21.4679	1.21103	4.16249	1	124	5388

a   Sales growth (SALES_GR)

Equity holders in highly leveraged firms may choose not to invest in projects that would help increase the firm's value, if they consider that, while they bear the entire cost of the investment, the returns from the investment are captured mainly by the debt-holders (Myers 1977). If this agency cost of debts is significant, fast-growing firms operating in highly lucrative businesses would tend to have more equity and less debt financing. Therefore, the firm with higher growth opportunities has lower leverage, especially in terms of long-term debts. This suggests that short-term debt ratios might be positively related to growth rates if growing firms reduce their agency cost by substituting short-term liabilities for long-term ones (Titman and Wessels 1988).

b   Age

If the age of the firm as calculated from the date of incorporation provides a positive influence on the firms' attitude towards high leverage or a high debt component in total borrowing, it should imply high credit-worthiness of the firm.

Table 4 Variance covariance matrix

Variables	SHAREPRI	LOGSALES	SALES_GR	NETSALES	NFATOTAA	LONG_TER	AGE
SHARE_PRI	73975.4	31.3688	-358.933	3.5804	-4.35924	6305.09	764.276
LOGSALES	31.3688	0.479796	-0.793323	0.0679571	-0.00719788	153.851	4.82355
SALES_GR	-358.933	-0.793323	38811.9	0.358854	0.57731	428.666	-185.708
NETSALES	3.5804	0.0679571	0.358854	0.283665	-0.0344321	-44.3804	1.56946
NFATOTAA	-4.35924	-0.00719788	0.57731	-0.0344321	0.0527382	16.24	-0.662776
LONG_TER	6305.09	153.851	428.666	-44.3804	16.24	349937	1024.56
AGE	764.276	4.82355	-185.708	1.56946	-0.662776	1024.56	461.782

Table 5 Correlation matrix

	AGE	SHAREPRI	LONG_TER	NETSALES	LOGSALES	SALGR	NFATOTAA	SALESGFA
AGE	1.00000	0.13321	0.08333	0.14260	0.33610	-0.00971	-0.14081	0.05199
SHARE_PRI	0.13321	1.00000	0.04050	0.02437	0.16425	-0.01202	-0.06680	0.02869
LONG_TER	0.08333	0.04050	1.00000	-0.14092	0.37307	-0.00449	0.11853	-0.07769
NETSALES	0.14260	0.02437	-0.14092	1.00000	0.18085	0.03472	-0.29228	0.51307*
LOGSALES	0.33610	0.16425	0.37307	0.18085	1.00000	-0.01164	-0.05072	0.09668
SALES_GR	-0.00971	-0.01202	-0.00449	0.03472	-0.01164	1.00000	-0.00537	0.02634
NFATOTAA	-0.14081	-0.06680	0.11853	-0.29228	-0.05072	-0.00537	1.00000	-0.43005
SALESGFA	0.05199	0.02869	-0.07769	0.51307*	0.09668	0.02634	-0.43005	1.00000

Note: We drop one of the variables for our regression analysis in the presence of high correlation (*) between two variables (correlation coefficient > 0.5).

c   Share price (SHARE_PRI)

Whether a firm chooses corporate debt as an important means of financing may also depend on its status in the stock exchange. Thus, we allow for the share price of each firm as an explanatory variable to observe if it should have any positive and significant effect on the borrowing pattern (debt) of the firm.

d   Fixed assets

The variable we actually use is defined as NFATOTAA (net fixed assets/total assets). The asset structure of a firm significantly affects the firm's capital structure. Since tangible fixed assets, serving as collateral, can lower the risk of the lender suffering the agency cost of debt, a greater portion of tangible fixed assets on the balance sheet leads to higher leverage. Grossman and Hart (1982), however, show that a firm's tangible fixed assets can be negatively correlated with its leverage. According to them, a firm with limited tangible fixed assets has less collateralized debts and more difficulty monitoring the extravagancy of its employees because of asymmetric information. In this case, a firm can attempt to reduce its agency costs by increasing leverage, which allows the firm to be more stringently monitored by creditors such as bondholders and financial intermediaries. Therefore, a firm with limited tangible fixed assets can raise its leverage. In addition, if the company has huge tangible fixed assets, then the proportion of fixed operating costs, instead of flexible operating costs, in the total operating costs for the firm's production and sales activities increases, thus raising its operational risk and probability of bankruptcy. In this case, an increase in tangible fixed assets can also lead to lower leverage. If an increase in tangible fixed assets raises a firm's bankruptcy such as the cost of asset sales, the firm's leverage could also be lowered.

e   Size of the firm (LOGSALES, NETSALES)

The size of a firm is closely related to leverage since it affects the firm's risk of default and bankruptcy costs. As a firm becomes big and diversifies its operations, the risk of default decreases; therefore, it has better access to external financing, which might result in high leverage. Direct bankruptcy costs also influence a firm's leverage: large-scale firms can have higher leverage since bankruptcy costs account for a smaller portion of their capital (Titman and Wessels 1988). Large firms are likely to obtain long-term loans more easily, since they have lower default risks and more assets to put up as collateral, compared with smaller firms. On the other hand, large firms can easily finance their investments directly from capital markets because asymmetric information is less likely to occur as outside investors can obtain more information about large firms than about small-sized firms. This allows larger firms to have lower leverage.

f   Industry classification (INDDUMMY)

Unique features of a certain industry also affect the debt structures of the firms in that industry. Each industry may have industry-specific patterns of financing because of disparities in product market structure and types of competitive actions between firms. To control for these industry effects, many empirical studies include dummies for industry. We classify the firms in the sample into 48 industry categories, as per the SIC code used in India. The industry dummy is chosen as INDDUMMY $=1$, if $SIC \geq 40$, and $= 0$ otherwise. As we shall discuss, other categorization does not offer any meaningful result.

g.   Long-term borrowing (LONG_TER)

We include long-term borrowing as one of the explanatory variables since a firms borrowing pattern and time preference may strongly influence its credit-worthiness. Consequently, the structure may be used to observe if firms that use long-term borrowing would also have a high leverage and if the component of debt in total borrowing would also be high for these firms.

The Model

The empirical result is based on the following formulation that uses the explanatory factors as described above. Thus, the hypothesized equation may be written as:

$$Y_{it} = \alpha_1 + \sum_{K=2}^{K} \alpha_K X_{Kit} + e_{it} , \quad \text{where,} \quad i= 1, 2, K, T \qquad \text{(I)}$$

where, Y_{it} is the dependent variable pooling *N* cross-sectional observations and *T* time-series observations, and X_{Kit}'s are the independent variables pooling *N* cross-sectional observations and *T* time-series observations. α_1 is a constant term and e_{it} is random error with mean 0 and variance σ^2. Evidently, we use a Panel Regression for carrying out this analysis.

Use of the panel data as described above, enables us to consider both the cross-sectional and time-series characteristics of our sample and helps to identify the sources of the

effects, which, as far as some of the earlier studies are concerned, appear mixed. With the panel data set, equation (I) can be estimated by means of Ordinary Least Squares (OLS) techniques. However, assumptions concerning the constant term α_1 in the estimation equation dictate the choice of estimation methods. If α_1 varies over time (year by year), it can be re-written as $\overline{\alpha_1} = \alpha_1 + \mu_t$, where, $\overline{\alpha_1}$ is a constant term and μ_t denotes the time-specific fixed effect. In that case, the equation becomes a *fixed-effect* model, which can now be estimated using the OLS method by incorporating year dummies. Our empirical investigation includes two different cases, one with fixed α_1 and the other with the *time specific fixed effect*. The year dummy variable is used when the time-specific effect is assumed. However, as we shall see shortly, all the equations that we estimate indicate the existence of a Fixed Effect model.

Therefore, the empirical model for this study is as follows, where we propose two different sets of equations to be estimated based on the two models discussed above:

$$DEBTINTO = \alpha_1 + \alpha_2 Age + \alpha_3 Shareprice + \alpha_4 Longterm$$
$$+ \alpha_5 NFATOTAA + \alpha_6 Logsales + \alpha_7 Netsales + \alpha_8 SalesGrowth + \varepsilon_{it} \quad \text{(II)}$$

$$LEVERAGE = \alpha_1 + \alpha_2 Age + + \alpha_3 Shareprice + \alpha_4 Longterm$$
$$+ \alpha_5 NFATOTAA + \alpha_6 Logsales + \alpha_7 Netsales + \alpha_8 SalesGrowth \quad \text{(III)}$$
$$+ \alpha_9 IndustryDummy + \varepsilon_{it}$$

Panel estimation results

For the first model, we attempt to identify and explain the factors behind corporate debt holdings by a company in its total borrowing (henceforth, DEBTINTO). The results are reported in Table 6. In fact, we regress five sets of equations with DEBTINTO as a function of: Age, Shareprice, Longterm borrowing, NFATOTAA, Logsales, Netsales, and SalesGrowth—variables and expected signs as discussed above. Notably, all the results obtained under this specification recommend one-way fixed effect model on the basis of the Hausman test statistic. Equation (1) in Table 6 for example uses most of these explanatory variables except NFATOTAA and SALES_GR, which were dropped. The reported R^2 is 0.84 (Table 6, column 10) and LONG_TER borrowing (at 1 per cent) and NETSALES (at 5 per cent) turn out to be positive and significant factors in explaining the debt component in total borrowing for the group of 450 firms. Although non-significant, AGE as an explanatory variable affects DEBTINTO negatively and this pattern continues for all the other equations specified subsequently. In other words, it turns out that, AGE either does not affect the choice of the debt structure of a firm significantly, or even if it does, the effect is negative, such that, more the age of a firm the lower is the tendency that it will use corporate debt as a means of finance.

Subsequently, equation (2) in Table 6, estimates DEBTINTO by dropping Net Sales as a variable and including NFATOTAA, and the model loses significant explanatory variables, since LONG_TER alone now offers a positive and significant coefficient. Similarly, equations (3, 4 and 5) add and drop variables to see if the model offers a

Table 6 Panel regressions

	1	2	3	4	5	6	7	8	9	10	11	12
Eqn No.	Eqn	AGE	SHARE_PRI	LONG_TER	NFATOTAA	LOGSALES	NETSALES	SALES_GR	INDUMMY	R^2	AIC	LA
1	**DEBT INTO**	**-0.178**	**0.0072**	**0.4999**		**-14.389**	**13.327**			**0.844**	**12.552**	**9.715**
		(-0.284)	**-0.999**	**(76.662*)**		**(-1.436)**	**(2.035**)**					
	LEVERAGE	-0.0022	-0.00023	0.0000135		-0.0145	-0.011			0.596	-3.1	-5.91
		(-8.08*)	(-0.769)	(5.134*)		(-3.591*)	(-4.271*)					
2	**DEBT INTO**	**-0.453**	**0.662**	**0.499**	**-28.542**	**-9.36**				**0.844**	**12552**	**9.715**
		(-0.753)	**-0.913**	**(76.691*)**	**(-1.871)**	**(-1.005)**						
	LEVERAGE	-0.0028	-0.000003	0.00001	0.0094	-0.01				0.595	-3.1	-5.91
		(-13.991*)	(-1.269)	(4.619*)	-1.551	(-5.981*)						
3	**DEBT INTO**	**-0.755**	**0.006**	**0.499**	**-22.617**		**8.15**			**0.844**	**12.552**	**9.715**
		(-1.532)	**-0.821**	**(77.263*)**	**(-1.493)**		**-1.348**					
	LEVERAGE	(-) 0.002	(-) 0.00003	0.001	0.009		(-) 0.01			0.56	-3.1	-5.91
		(-14.7*)	(-1.7)	(3.5*)	-1.7		(-6.9*)					
4	**DEBT INTO**	**-0.214**	**0.0071**	**0.499**		**-14.367**	**14.921**	**-0.002**		**0.844**	**12.553**	**9.715**
		(-0.34)	**-0.988**	**(76.648*)**		**(-1.433)**	**(2.032**)**	**(-0.229)**				
	LEVERAGE	-0.0022	-5	0.00001		-0.01	-0.011	-0.000003		0.596	-3.1	-5.91
		(-8.843*)	(-0.791)	(5.073*)		(3.405*)	(-4.176*)	(-0.103)				
5	**DEBT INTO**	**0.652**	**0.003**			**95.232**	**-19.68**			**0.685**	**12.552**	**9.715**
		-0.702	**-0.359**			**(6.487*)**	**(-2.305**)**					
	LEVERAGE	-0.0022	-0.000002				-0.012	-0.011		0.593	-3.1	-5.91
		(-8.699*)	(-799)				(-4.056*)	(-2.882**)				
6	LEVERAGE	-0.002	-0.000002	0.000001			-0.01	-0.00004		0.56	-3.1	-5.91
		(-13.1*)	(-1.2)	(3.5*)			(-6.9*)	(-2.3*)				
7	LEVERAGE	-0.002	-0.000005	0.000001	0.009		-0.01	-0.00004	-0.002	0.56	-3.1	-5.91
		(-13.9*)	(-1.28)	(4.6*)	-1.53		(-5.9*)	(-2.5**)	(-3.6*)			
8	LEVERAGE	-0.001	-0.00001	0.00001	0.008	-0.01		-0.00005		0.57	-3.1	-5.91
		(-7.9*)	(-0.45)	(3.9*)	-1.7	(-4.9*)		(-1.2)				

Notes ** Significant at 1% level, * Significant at 5% level.

better insight into the factors that affect the choice of a firm's debt structure significantly. All of these equations, however, return a high goodness of fit ($R^2 = 0.84$), except equation (5), where R^2 drops to 0.68. For equation (5), we dropped LONG_TER and included NETSALES along with AGE, SHARE_PRI and LOGSALES and observe that while LOGSALES become positive and highly significant (Table 6, column 6), NETSALES becomes negative though significant. This denotes a reversal of sign for both LOGSALES (negative so far) and NETSALES (positive so far) compared to all the previous equations where these variables have been picked for estimating DEBTINTO. At the same time however, AGE reports a positive coefficient unlike in all the previous cases. We believe that the system becomes unstable if LONG_TER is dropped from the analysis, despite the fact that LONG_TER and LOGSALES display some degree of correlation (0.37), which is however, not surprising because long term borrowing of a firm is often associated with buy-back options offered by the financer. This furthermore, explains the negative (albeit, non-significant) coefficient reported by LOGSALES, since sales growth in this case reduces the possibility that the firm chooses corporate debt as a mode of financing.

The second model used in this analysis is based on equation (III) and the results are also reported in Table 6. As already mentioned, the dependent variable for this Panel regression is LEVERAGE and defined as the *proportion of firm's total domestic debt to total assets*. Once again, we offer a number of cases, where, we drop and insert variables in favour of obtaining the most appropriate combination that explains a firm's LEVERAGE best. The Hausman test for these equations recommends the one-way fixed effect model as in the previous case. Therefore, we begin with equation (1), where LEVERAGE is a function of AGE, SHARE_PRI, LONG_TER, LOGSALES and NETSALES. Of these, AGE reports a small negative (-0.0022) but highly significant ($t = -8.08$) coefficient. While SHARE_PRI continues to display little impact on the choice and volume of the financing pattern of a firm, the variable LONG_TER reports a positive (though very small) and highly significant coefficient. In this respect, there is not much difference with the previous case, although, the coefficient values are substantially greater for DEBTINTO. Finally, both LOGSALES and NETSALES offer negative and significant relationship with LEVERAGE, which implies that the firms do not choose corporate debt as a mode of financing in the presence of high sales. In other words, stated more simply, a bad sales performance may be thought of as an indicator that the firm goes into high indebtedness.

The pattern observed here, continues for the remaining seven equations reported in Table 6. Additionally, we have included SALES_GR as an explanatory variable in equation (4) in the presence of LONG_TER and LOGSALES and it reports a low negative and non-significant coefficient. However, when both LONG_TER and LOGSALES are dropped from equation (5), the coefficient of SALES_GR increases and becomes significant at the 5 per cent level. Finally, equation (7) uses the industry dummy variable (INDDUMMY) discussed above. In fact, we have specified the dummy variable for the industrial categories around several possible options, such as, INDDUMMY = 1, if $SIC \geq 25$ or, $SIC \geq 30$ and = 0, otherwise, none of which retrieved any meaningful result. The choice of $SIC \geq 40$, however, shows that, the higher the industrial classification type, the lower is the possibility that the firm enters into high LEVERAGE.

3 Concluding remarks

The corporate debt market in India has historically demonstrated poor participation from the firms. Despite a substantial increase (from Rs.197,287 million in 2001-02 to Rs.360,388 million in 2002-03) in the secondary market turnover through issue of corporate debt, it remains a rather small fraction of the total turnover, with the transaction through the government securities still overwhelming. Although it is often argued that transaction in the corporate debt market in India might be the source of many unscrupulous activities since it is mostly through private placements (93 per cent) and lack sufficient control and supervision by the regulatory authority, there is little doubt that it is a cheaper option for the firms to raise capital through this market.

In spite of the well-known attributes associated with it, and that which has led many firms in the newly industrialized countries, as also in the USA and Europe, to have vigorously routed their financing pattern through the corporate debt market, the scope and activities appear rather narrow in India. This paper, therefore, investigates the firm level conditions in India and tries to identify the factors that strongly influence a firm's participation in the corporate debt market. In the process, we choose a number of variables that are known to affect a firm's choice of financing pattern. These include, the age of the firm, the level of long-term borrowing, share prices, the ratio of net fixed assets and total assets, the size of the firm as captured through its sales figures and through the growth of sales, and so on. Evidence at the country-level identifies LEVERAGE (proportion of firm's total domestic debt to total assets) as an important dependent variable in observing the impact of the above-mentioned explanatory variables on the firm's choice of financing through the corporate debt market. However, in addition to LEVERAGE, we define another dependent variable DEBTINTO (proportion of debt; which includes fixed deposits, commercial papers and debentures, in the total borrowing of a firm) and use this to compare the efficacies of these two dependent variables for a panel of 450 firms with an average of 5,300 observations per variable.

The results display that among the set of variables chosen, Age displays a negative and non-significant impact on both the dependent variables, while Longterm borrowing continues to be positive and significant all through. For some equations (notably 1–4, in Table 6), Shareprice (though non-significant) and Netsales (significant) report alternate signs for DEBTINTO (positive) and LEVERAGE (negative). However, NFATOTAA and INDDUMMY turn out to be of little or no impact on DEBTINTO and LEVERAGE, except in equation (7), where, INDUMMY has a negative and significant impact on LEVERAGE. Finally, it is observed that SalesGrowth negatively and significantly explains the LEVERAGE of a firm when Long-term borrowing and LOGSALES are dropped from the analysis.

Therefore, on the basis of these results we conclude that while LEVERAGE as the more accepted measure of a firm's debt market participation depends crucially on the level of the firm's long-term borrowing and sales performances, DEBTINTO as the other measure is also strongly influenced by the level of long-term borrowing and sales performance of the firm. However, since the explanatory variables return different signs for the two dependent variables, future policy propositions and reforms aimed at affecting positively or negatively the level of activity in the corporate debt market must take cognizance of such possibilities. Finally, therefore, this study provides some important observations on the factors that potentially influence a firm's choice of

participation in the corporate debt market, which we believe should be valuable to researchers and policymakers who wish to look into the prospects of the corporate debt market in India deeper.

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