The Determinants of Corporate Debt Maturity for NSE-Listed Corporates

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SAGE

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Abstract

[illegible]

Keywords

[illegible]

JEL Classification

[illegible]

Introduction

[illegible]

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Literature Review

Theoretical Framework

Agency Theory

LTD. [illegible] Kale and Noe (1990) suggested that within separating equilibrium is possible only in a framework without [illegible] (Kale & Noe, 1990). Consequently, the testable hypotheses under the signalling and liquidity [illegible] theories can be stated as

H: Firm quality has a negative effect on the debt maturity structure.

H: Liquidity has a positive impact on the debt maturity structure.

H: Leverage has a positive effect on the debt maturity structure.

Matching Principle

Stohs and Mauer's (1996) found that larger, less risky firms with longer-term asset maturities use longer-term debt. They measure the asset maturity by taking the ratio of the weighted maturity of current assets and the weighted maturity of fixed assets. If physical assets are more, then they can be used as collateral, reducing the [illegible] of [illegible] and agency costs of debt. Hence, high tangible assets are expected to be associated with high LTD. Hence, the testable hypothesis under the matching principle can be stated as

H: The asset maturity structure has a positive effect on the debt maturity structure.

Tax Hypothesis

As per Gordon and Lee (2001), the net tax gain from the use of corporate debt is proportional to nominal interest rates so that firms respond in the times of high-interest rates. On the same grounds, it can be hypothesized that firms should shift towards more LTD as long-term rates rise relative to short-term rates. LTD is more expensive as the firm can avoid more taxes while having higher profitability. This theory represents that the optimum debt maturity structure is a trade-off between tax advantages for firm debts and disadvantages of agency costs. However, Kane, Marcus and McDonald (1985), by constructing an option valuation model, have provided empirical evidence against the universal validity of such advantages. They state that meaningful measure of advantage to debt is the extra rate of return (net of the market premium for bankruptcy risk). It indicates that the tax effects [illegible] is [illegible] related to debt maturity. In other words, if the effective tax rate is low, then firms prefer to issue LTD. Further, as per Graham (2000), large, liquid, profitable firms with low expected distress costs use debt conservatively. The testable hypothesis under the trade-off theory can be

H: Tax effects have a negative impact on the corporate debt maturity structure.

Empirical Review of the Literature

There is a dearth of empirical studies on the debt maturity structure, although there are quite few research studies that have dealt with the issue indirectly. For example, Titman and Wessels (1988), Barclay and Smith (1995), [illegible] (1992) employed alternative measures of borrowing (long term and short term) and associated them with firm-specific characteristics while investigating the determinants of borrowing choice of the firms. Existing literature dealing directly with the subject of debt maturity majorly concentrates on the developed markets of the USA and the UK (e.g., Barclay & Smith, 1995; Guedes & Opler, 1996; Johnson, 1997; Mitchell, 1993; Ozkan, 2000, 2002; Scherr & Hulburt, 2001; Stohs & Mauer, 1996). Cross-country studies (Antoniou, Guney, & Paudyal, 2006) analyse the case of France, Germany and the UK, but the debt maturity choices in [illegible] are studies in the context of developing economies.

Bonnet (2007) analysed the firm-level determinants of the maturity structure of Czech corporate debt for the time period 2000–2004 and discovered LTD to increase with company size, leverage and asset maturity, while growth options, corporate tax rate, [illegible] and company-level volatility were found to be statistically insignificant for the debt maturity structure of the findings.

Terra (2011) tested the main theories of corporate debt maturity in a multi-country setting [illegible] country-specific differences, by using a sample of 1,593 non-financial firms from the 7 largest economies of Latin America and from the USA over a 17-year period from 1987 to 2003. The study employed dynamic panel modelling and [illegible] that there is a significant dynamic component in the [illegible] of a firm's maturity structure, and firms [illegible] adjustment [illegible] towards optimal maturities. Further, the determinants of the maturity structure and their impact were found to be similar between Latin American countries and the USA, in spite of noticeable differences in the financial and business environments of these countries. The [illegible] hypothesis [illegible] sufficient to [illegible] the debt maturity choices. By considering a sample of South American countries, Koch and Terra (2010) showed that a country's level of institutional quality has a first-order effect on the corporate debt maturity structure. Zheng, El Ghoul, Guedhami and Kwok (2012) [illegible] that national culture is a significant determinant of the cross-country variation in corporate debt maturity. Fan, Titman and Twite (2012) documented that firms from countries with weaker legal and [illegible] corruption [illegible] have shorter debt maturities, and those from countries with explicit bankruptcy codes have longer debt maturities.

Correa et al. (2014) explored the impact of firm-level factors as well as the institutional environment on debt

Objective and Methodology

firm-specific and macroeconomic determinants of the maturity of debt [illegible].

Data Sources

The data has been taken from the annual financial reports of NIFTY 50 index constituents—Indian public-listed firms listed on the NSE for the period 2008–2019. Banks are excluded due to their unique regulatory capital requirements and for information homogeneity of the firms. A sample of 39 Indian non-financial firms listed on the NSE during the period 2008–2019 was taken to test the hypotheses (refer to Table A1).

CAPITALINE database has been used to extract detailed balance sheets and income statements for NIFTY 50 companies. Amongst these, the basis of selection for the companies is the availability of financial data and positive value of total debt (TD) for the period under study so as to rule out the possibility of an undefined dependent variable. These firms do not hold any changes in their financial year during the research period. According to these criteria, the study finally takes into account 39 firms listed on the NSE of India, yielding 468 firm-year observations, correspondingly. Table A2 lists the data sources for firm-specific and macroeconomic variables used in the study.

Methodology

A panel data of 39 companies across 12 years has been used. To construct the model for variable selection in the initial stage, past studies on debt maturity have been leveraged. Variables selected take into consideration all aspects such as agency costs, signalling and liquidity risks, tax effect theories and matching principles. Macroeconomic variables have been used as control variables in the study as described in Table A2. Apart from the dependent variable long-term debt to total debt (LTDTD), 10 independent variables have been defined, which are potential determinants or predictor variables.

At the outset, the visualization of dependent variable across the 39 firms was carried out. After that, the descriptive statistics were done for all the variables listed in Table 1. A detailed analysis of panel variables was done for overall, between (variables varying between firms) and within (variables varying within the firm).

Variables Used in the Study

Table 1. Variable Description

Variables	Symbol	Measure	Expected Sign
Debt maturity	LTDTD	Ratio of long-term debt (debt maturing in more than one year) to total debt	NA
Agency cost/contracting cost theory			
Growth rate	GROWTH	Sales growth to total asset growth	−
Firm size	LNSA	Natural logarithm of firm's total sales	+
Signalling and liquidity risk theories			
Profitability	PROFIT	Earnings before interest and taxes to total assets	−
Liquidity	CR	Ratio of current assets to current liabilities	+
Leverage	TDTA	Ratio of the book value of total debt to the book value of total assets	+
Matching principle theory			
Asset maturity	NFADEP	Ratio of net fixed assets to gross block depreciation (Measures the rate at which assets are being consumed)	+
Tax hypothesis			
Effective tax rate	ETAX	Ratio of current year taxes to profits before tax	−
Macroeconomic variables			
Base rate (prime lending rate has been replaced by base rate in July 2010)	BR	The minimum rate set by the Reserve Bank of India below which banks are not allowed to lend to its customers. It has been taken into account since banks are the principal contributors of debt capital.	−
Wholesale price index	WPI	The price of a representative basket of wholesale goods and is sometimes used as a central measure of inflation. It has a significant role in [illegible] the sales growth and hence directly influences the economic growth.	−
Wholesale price index YoY change ratio	WPILI	Signifies the relative change in prices and hence determines the market sentiments owing to inflationary [illegible]	−

Source: [illegible]

Hypotheses Used in the Study

The following hypotheses are set out for empirical testing in the context of Indian firms:

- H_1: Growth rate is negatively related to debt maturity
- H_2: Firm size is positively related to debt maturity
- H_3: Firm quality is [illegible] related to debt maturity
- H_4: Liquidity is positively related to debt maturity
- H_5: Leverage is positively related to debt maturity
- H_6: Asset maturity is positively related to debt maturity
- H_7: Effective tax rate is negatively related to debt maturity
- H_8: Interest rate is [illegible] related to debt maturity
- H_9: [illegible] is [illegible] related to debt maturity
- H_{10}: Wholesale price index [illegible] is [illegible] related to debt maturity

Panel Least Squares with Fixed Effects

The data being used in this study is balanced panel data. The dependent variable, debt maturity, is influenced by many more variables which do not form part of this exercise, for example, efficient management practices, business conditions at the geographical location of the firm, marketing strategies employed, relationship with stakeholders such as distributors, etc. Due to this effect, the estimates in the regression model can be inconsistent. So to minimize the inconsistency due to the omission of these variables, this study uses firm-specific control variables which can be of fixed effect type or random effect type.

Fixed effect explores the relationship between the dependent variable (DEBTM) and predictor variables within a firm. However, predictor variables may or may not be influenced by individual characteristics of a firm. That is why there is an assumption of the correlation between firm's error term and predictor variables. Using fixed effects, this influence is controlled. It eliminates the effect of those time-invariant characteristics so that the net impact of the predictors on the outcome variable can be assessed (Baltagi, 2008).

Original [illegible] equation: $y_{it} = \alpha + \beta x_{it} + u_i + \varepsilon_{it}$

Changed to: $y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it}$

When the within firm variance is minimal, it implies that the variables are more towards time-variant nature, and since fixed effects control for the time-invariant characteristics, it will not work well in such cases.

The fixed-effects model controls for all time-invariant differences between the individuals, so that the estimated coefficients of the fixed-effects models cannot be biased due to omitted time-invariant characteristics.

One side effect of the features of fixed-effects models is that they cannot be used to investigate time-invariant causes of the dependent variables. Technically, time-invariant characteristics of the individuals are perfectly collinear with the dummy variable used for firms. Substantively, fixed-effects models are designed to study the causes of changes within a firm. A time-invariant characteristic cannot cause such a change because it is constant for each person.

Another method to apply fixed effects is to introduce dummy variables into the model. So the equation of fixed effects model becomes:

$$
\begin{aligned}
DEBTM_{it} = \alpha_i &+ \beta_1(GROWTH_{it}) + \beta_2(SIZE_{it}) \\
&+ \beta_3(PROFIT_{it}) + \beta_4(LIQ_{it}) + \beta_5(ETAX_{it}) \\
&+ \beta_6(LEADER_{it}) + \beta_7(ASSETM_{it}) + \beta_8(IR_{t}) \\
&+ \beta_9(WPI_{t}) + \beta_{10}(WPI[illegible]_{t}) + \gamma_1(DC_1) \\
&+ \gamma_2(DC_2) + \gamma_3(DC_3) + \dots + \gamma_{n}(DC_{n}) \\
&+ \gamma_{n}(DC_{n}) + \varepsilon
\end{aligned}
$$

where i represents the firm and t is the time

γ is coefficient of the dummy variable DC_i for ith firm

α_i is the intercept

β are coefficients for independent variables X_{it} and

ε is the error term.

Analysis and Interpretation

Data Analysis

The preliminary examination of dependent variables across the [illegible] firms has been carried out (Figure 1). After that, the descriptive statistics for all the variables (listed in detail in Table A1) have been presented in Table 2. A detailed analysis for panel variables has been carried out for overall, between variables varying between time and within variables varying within the firm (Table 3). Table 4 displays the correlations among the variables selected in the study.

Now we take a look at the variables in the data set. A preliminary investigation into the data can provide insights about the variance distributions in the panel data which, to a great extent, help in determining the analytical techniques to be used for the study.

As it can be seen in Figure 1, debt maturity (DEBTM) varies between 0 and 1 by definition, and here in the majority of the firms (denoted by Company) it follows decreasing trend over the years.

Table 2 reports the summary statistics of the variables used in our analysis. As observed in the table, dependent

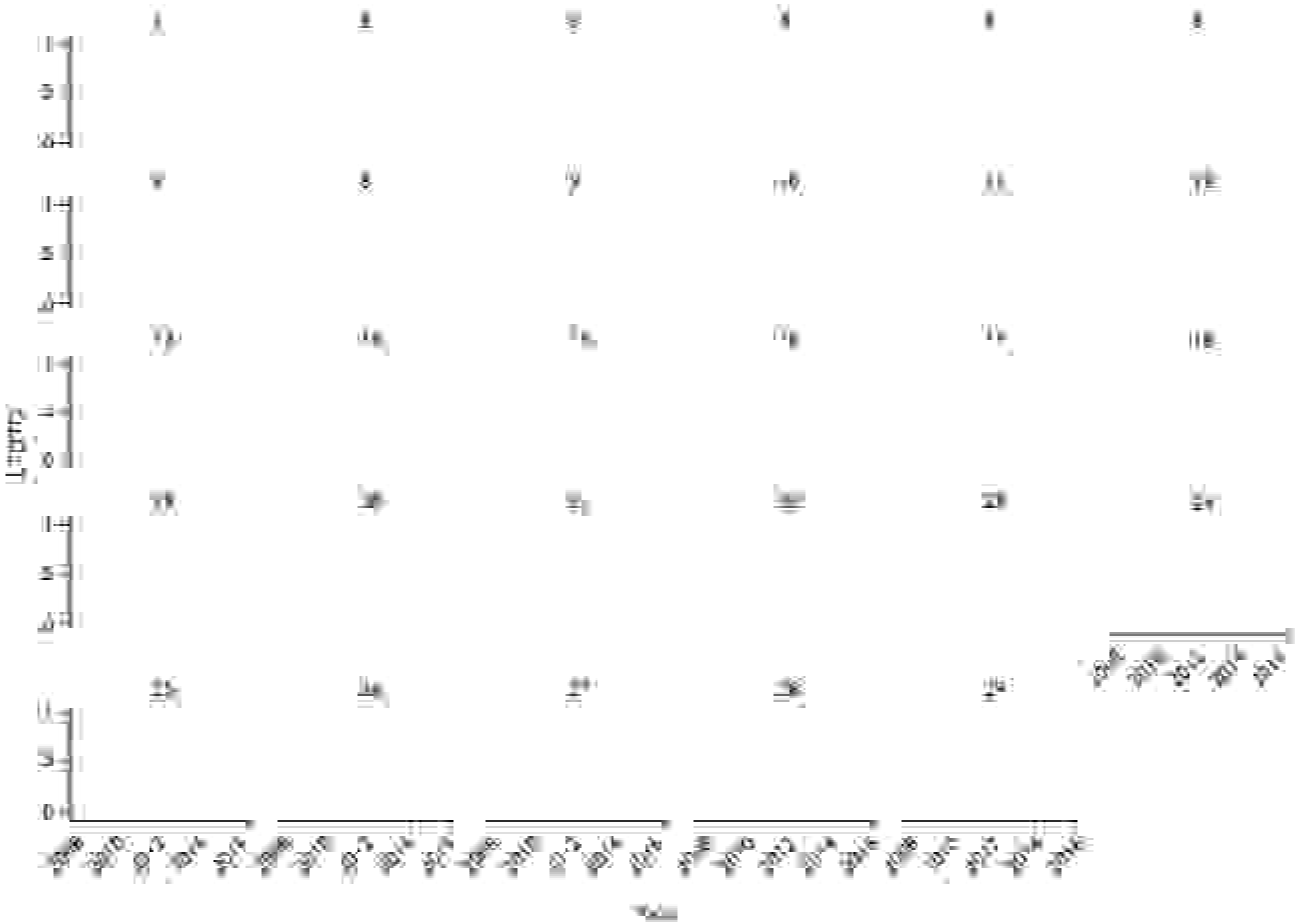

Figure 1. Dependent Variable Debt Maturity Structure Across the Firms
Source: [illegible]

Table 2. [illegible]

Variables	Obs	Mean	Std. Dev.	Min	Max
LTDTD	261	0.5130	0.3017	0.00	0.9873
GROWTH	261	0.1223	0.5722	−0.7217	4.5982
LNSA	261	1.0253	0.3427	0.6786	1.5609
PROFIT	261	0.1875	0.1268	−0.0789	0.644
CR	261	0.2398	0.1700	0.0335	1.1300
TDTA	261	0.2379	0.2238	0.0003	0.8665
NFADEP	261	0.5975	0.1452	0.2865	0.9249
EFTAX	261	0.7025	4.7717	−14.1484	49.7598
SR	261	11.2087	1.9046	8.8750	14.1250
WPI	261	155.8925	21.4971	[illegible]	[illegible]
WPIL1	261	1.0523	0.0363	0.973	1.0956

Source: [illegible]

variable LTDTD ranges from 0.0 to 0.4873 with an average value of 0.51. Among the independent variables, GROWTH, EFTAX and WPI exhibit the wide range of variation for the selected 29 non-financial firms. While there is not much variation in the trend variable WPIL1. The same is supported by their averages and measures of dispersion in Table 2.

Coming to panel data, the overall variation in variables can be accounted for in two ways: (A) how the variables are varying within the firm over the time horizon, called within variation, and (B) how the variables are varying with time which can be seen over the years by averaging the variables over all the firms, which is called between variation. Since balanced panel data has been used, there are no missing values to be treated in the data set.

As can be observed in Table 3, both between and within variations are similar in the dependent variable, debt maturity (LTDTD). There is more of 'within' variation in growth rate (GROWTH) and effective tax rate (EFTAX)—rightly so, as these are more or less driven largely by business environment. Firm size (LNSA), profitability (PROFIT), liquidity (CR), leverage ratio (TDTA) and asset maturity (NFADEP) have larger 'between' variations as supported by the fact that these are firm-specific variables which largely depend on the decision-making within a firm according to its goals and business practices.

Table 3. [illegible]

Variables		Mean	Std. Dev.	Min	Max
LTDTD	Overall	0.3005	0.3117	0.0000	0.9833
	Between		0.2660	0.0042	0.8690
	Within		0.1243	0.0055	1.2166
GROWTH	Overall	0.1222	10.3422	−96.3231	64.5342
	Between		7.2424	−8.5471	7.3376
	Within		9.9538	−76.8745	37.3707
LNSA	Overall	1.0222	0.1427	0.6706	1.1069
	Between		0.1374	0.7874	1.2597
	Within		0.0454	0.8882	1.1398
PROFIT	Overall	0.1875	0.1264	−0.1709	0.6441
	Between		0.1169	0.0339	0.6036
	Within		0.0493	−0.1541	0.4462
CR	Overall	0.2238	0.1709	0.0733	1.1338
	Between		0.1554	0.0488	0.8451
	Within		0.0744	−0.0060	0.6809
TDTA	Overall	0.1379	0.2256	0.0003	0.8463
	Between		0.1160	0.0194	0.6239
	Within		0.0951	0.0686	0.6153
NFADEP	Overall	0.5995	0.1851	0.2955	0.9249
	Between		0.1772	0.3501	0.8856
	Within		0.0533	0.4715	0.8685
EFTAX	Overall	0.7023	6.1107	−16.7484	69.7270
	Between		1.9341	−1.4370	7.2884
	Within		5.8708	−14.0090	62.8711
BR	Overall	11.1163	1.9846	8.8700	14.0250
	Between		0.0000	11.3163	11.1163
	Within		1.9846	8.8700	14.1250
WPI	Overall	152.85	23.19	116.63	181.19
	Between		0.00	152.85	152.85
	Within		23.17	116.63	181.07
WPIL1	Overall	1.0533	0.0363	0.9711	1.0958
	Between		0.0000	1.0533	1.0533
	Within		0.0363	0.9711	1.0953

Source: [illegible]

Correlation Analysis

It is imperative to check correlation among the variables before proceeding with regression models. Table 4 reports the results of the pair-wise correlation between all the variables in the data set. The selected variables do not suffer from multicollinearity, as can be observed from the analysis. The following inference is drawn from the correlation analysis:

- The dependent variable debt maturity is positively correlated with firm size and leverage and negatively [illegible] growth [illegible] as predicted by the earlier literature. Wholesale price index is negatively correlated with debt maturity as expected. However, the negative correlation between debt maturity and liquidity and the positive association between debt maturity and effective tax rate are contradictory to what theory predicts; the correlation is [illegible] not significant in the case of liquidity.
- There is a significant [illegible] correlation between firm size (LNSA) and [illegible] variables. [illegible] negative correlation with firm quality (PROFIT) [illegible] hypothesis [illegible]
- Firm size (LNSA) shows a positive correlation with the leverage ratio (TDTA) [illegible] that larger firms [illegible] more leveraged.
- The negative correlation between firm size (LNSA) and [illegible] (NFADEP) [illegible] consumption of assets is higher in larger firms [illegible]
- A positive correlation between debt maturity (LTDTD) and leverage ratio (TDTA) signifies that highly levered firms [illegible] higher [illegible] a larger proportion of LTD component in [illegible] debt.
- Firm quality (PROFIT) is negatively related to leverage ratio (TDTA) [illegible] being paid for financing assets [illegible] long [illegible]

Table 4. [illegible]

Variables	LTDTD	GROWTH	LNSA	PROFIT	CR	TDTA	NFADEP	EFTAX	BR	WPI	WPIL1
LTDTD	1.00										
GROWTH	−0.11	1.00									
LNSA	0.10	0.08	1.00								
PROFIT	−0.03	0.04	−0.53***	1.00							
CR	−0.07	0.01	−0.43***	0.49***	1.00						
TDTA	0.41***	0.08	0.42***	−0.33***	−0.32***	1.00					
NFADEP	0.03	0.06	−0.53***	0.33***	0.31***	0.01	1.00				
EFTAX	0.11*	0.05	0.07	−0.08	0.01	0.11*	−0.09	1.00			
BR	0.20***	0.04	−0.23***	0.09	0.07	0.03	0.04	0.10	1.00		
WPI	−0.34***	0.01	0.38***	−0.11*	0.05	0.06	−0.14	−0.09	−0.19	1.00	
WPIL1	0.02	0.04	−0.11	0.01	0.04	0.06	−0.01	−0.01	0.06	−0.37***	1.00

Source: [illegible]

Note: [illegible]

[illegible]

Panel Unit Root Tests for the Variables

Variables are tested by using the most commonly used panel unit root test, that is Levin, Lin and Chu (LLC, 2002). The hypotheses of the panel unit root are as follows:

H_0: [illegible]

H_1: [illegible]

Table 5. [illegible]

Variables	Statistic	P-value
LEVER	−6.3819	[illegible]
GROWTH	[illegible]	[illegible]
LNSA	−7.2167	[illegible]
PROFIT	−8.1693	[illegible]
CR	−10.8498	0.0000
TDTA	[illegible]	[illegible]
NFADEP	−3.5729	0.0050
ETAX	[illegible]	[illegible]
BR	−11.1100	0.0000
WPI	[illegible]	[illegible]
WPI1	[illegible]	[illegible]

Source: [illegible]

Table 5 [illegible] panel unit root test [illegible] LLC test reveals that [illegible]

Estimation Results

Table 6 [illegible]

Table 6. [illegible]

Variables	Coefficient	Std. Error	t-Statistic	Prob.
GROWTH	−0.0005	0.0001	−0.41	0.688
LNSA	[illegible]	[illegible]	[illegible]	[illegible]
PROFIT	0.0248	0.2971	0.08	0.934
CR	[illegible]	[illegible]	[illegible]	[illegible]
TDTA	0.0594	0.1840	0.38	0.799
NFADEP	[illegible]	[illegible]	[illegible]	[illegible]
ETAX	[illegible]	[illegible]	[illegible]	0.856
BR	[illegible]	[illegible]	2.92	[illegible]
WPI	0.0006	0.0014	0.42	0.676
WPI1	[illegible]	[illegible]	[illegible]	[illegible]
R-squared	[illegible]	F-statistic	[illegible]	
Adjusted R-squared	[illegible]	Prob (F-statistic)	[illegible]	

Source: [illegible]

[illegible]

The observed pattern of wholesale price index with debt maturity is not in accordance with the prediction one. Whereas the association between wholesale price index change rate and debt maturity is negative in line with the predicted sign, the figure is statistically insignificant.

In the model summary, R-square is [illegible] per cent and adjusted R-square [illegible] per cent, which means that more than [illegible] per cent of the variation in debt maturity (LTDTA) can be explained by the explanatory variables.

Conclusion

The study empirically investigates the firm-specific and macroeconomic determinants of debt maturity structure decisions using a sample of [illegible] non-financial Indian firms listed on the NSE during the period [illegible]. The results suggest that firm size, liquidity, asset maturity and firm age are the significant determinants of the debt maturity choice. Though firm size and firm age [illegible] have the predicted effect on debt maturity as hypothesized. Growth rate, leverage and wholesale price index change rate do have the predicted effect on debt maturity. However, results are not statistically significant. A reason for the insignificant coefficient can be attributed to the measurement issues. The study does not produce any empirical evidence to conclude that effective tax rate and firm quality have an impact on debt maturity which can be a probable outcome of an underdeveloped debt market. Macroeconomic control variables are not significant among the [illegible]. On the whole, the study does not produce conclusive evidence to [illegible] the [illegible] fixed effect model.

The study suggests that the debt maturity choice is mainly determined by internal characteristics of the company and not the external environment. It further suggests that the present theoretical framework does not provide an ample and general explanation of the corporate debt maturity structure of the firm. As a matter of fact, theories are a mere collection of partial explanations for the phenomenon. The gap in theoretical research in this instance becomes apparent in the empirical analysis where various hypotheses are at best only partially supported.

The current study has certain limitations. First, the size of the sample used is quite small relative to the universe of listed firms in the Indian stock market. Second, the definition of debt maturity used in the study tends to consider LTD as homogeneous. While in reality, debt issues might have provisions that make them largely heterogeneous. Third, the other macroeconomic parameters such as regulatory quality, rule of law, voice and accountability can be considered in the future studies. Lastly, macroeconomic variables in the debt maturity structure can be empirically investigated in depth in the context of emerging economies.

Appendices

Table A1: List of firms selected for the study

S. No.	Symbol	Company Name	Industry
1	ADANIPORTS	Adani Ports and Special Economic Zone Ltd	Services
2	AMBUJACEM	Ambuja Cements Ltd	Cement & Cement Products
3	ASIANPAINT	Asian Paints Ltd	Consumer Goods
4	AUROPHARMA	Aurobindo Pharma Ltd	Pharma
5	BPCL	Bharat Petroleum Corporation Ltd	Energy
6	BHARTIARTL	Bharti Airtel Ltd	Telecom
7	COALINDIA	Coal India Ltd	Metals
8	DRREDDY	Dr. Reddy's Laboratories Ltd	Pharma
9	EICHERMOT	Eicher Motors Ltd	Automobile
10	GAIL	GAIL (India) Ltd	Energy
11	GRASIM	Grasim Industries Ltd	Cement & Cement Products
12	HINDALCO	Hindalco Industries Ltd	Metals
13	ITC	ITC Ltd	Consumer Goods
14	IDEA	Idea Cellular Ltd	Telecom
15	LT	Larsen & Toubro Ltd	Construction
16	LUPIN	Lupin Ltd	Pharma
17	M&M	Mahindra & Mahindra Ltd	Automobile

S. No.	Symbol	Company Name	Industry
18	MARUTI	Maruti Suzuki India Ltd	Automobile
19	ONGC	Oil & Natural Gas Corporation Ltd	Energy
20	RELIANCE	Reliance Industries Ltd	Energy
21	SUNPHARMA	Sun Pharmaceutical Industries Ltd	Pharma
22	TATAMOTORS	Tata Motors Ltd	Automobile
23	TATASTEEL	Tata Steel Ltd	Metals
24	ULTRACEMCO	UltraTech Cement Ltd	Cement & Cement Products
25	ZEEL	Zee Entertainment Enterprises Ltd	Media & Entertainment
26	TATAMOTORS	Tata Motors Ltd	Automobile
27	TATASTEEL	Tata Steel Ltd	Metals
28	ULTRACEMCO	UltraTech Cement Ltd	Cement & Cement Products
29	ZEEL	Zee Entertainment Enterprises Ltd	Media & Entertainment

Source: Author's compilation.

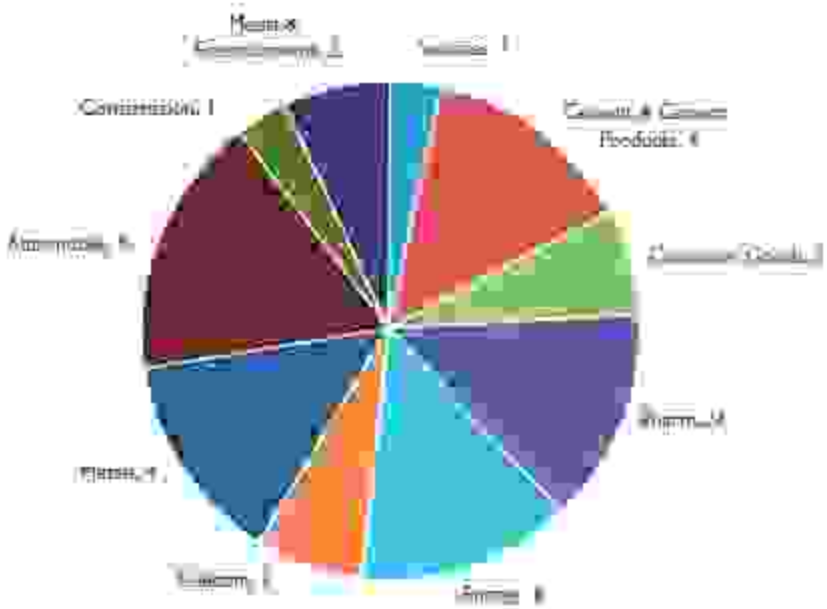

Figure A1: [illegible]
Source: [illegible]

Table A2: [illegible]

S. No	Type/Variable	Symbol	Definition	Formula	Source
0	Debt intensity (Dependent Variable)	DEBT	Long-term debt/Total debt	Convertible debentures	BS
				+ Non-convertible debentures	BS
				+ Partly convertible debentures	BS
				Long Debt/Long-term liabilities	BS
				+ Term loans - institutions	BS
				+ Term loans - banks	BS
				+ Term loans - others	BS
				+ Borrowing from Government (LTL)	BS
				+ Debentures/Bonds	BS
				+ Loans from group Cos	BS
				+ Loans from banks	BS
				+ Loans from financial	BS
				+ Loans from GOI/PSUs	BS
				+ Fixed deposits/ Govt	BS

[illegible]

S. No.	Type/Variable	Symbol	Definition	Formulae	Source
Agency Costs					
1	Growth [illegible]	GROWTH	Sales growth [illegible] growth	Sales turnover YoY growth/[illegible] assets YoY growth	[illegible] BS
2	Firm size	LNSA	Natural log of [illegible] sales	Natural log of [illegible] sales	[illegible]
Signalling and Liquidity Risks					
3	[illegible] quality	[illegible]	EBIT/[illegible]	Operating profit [illegible] sales	[illegible]
4	Liquidity	CR	CA/CL	Total current assets/current liabilities	BS
5	Leverage ratio	TDTA	BV of total debt/BV of total assets	Total debt/total assets	BS
Matching					
6	Asset maturity	NFAGB	Net fixed assets/Gross block	Net block/gross block	BS
Tax effect theories					
7	Effective tax rate	EFTAX	Tax [illegible] profit	Tax for the current year/profit before tax	[illegible]
Macroeconomic variables					
8	Base rate	[illegible]	http://www.tradingeconomics.com/india/bank-lending-rate			
9	Wholesale price index	WPI	[illegible]			
10	WPI YoY change rate	WPI[illegible]	Base Year: 2004–2005 = 100			

Source: [illegible]

Notes

1. Semi-annual [illegible] takes place in the [illegible] The [illegible] taken up for the study is as [illegible]
2. See http://www.[illegible].com

References

[illegible]

Bancel, F., & Mittoo, U. R. [illegible] The Journal of Finance, [illegible]

[illegible]

Correia, [illegible] (2001). [illegible] An international comparison of [illegible] (Working Paper No. [illegible]). Universidade do Porto, Faculdade de Economia do Porto.

[illegible] Why are [illegible] firms using more [illegible] debt? Journal of Financial Economics, [illegible]

[illegible] The Journal of Finance, [illegible]

[illegible]

Diamond, D. W. (1991). [illegible] The Quarterly Journal of Economics, 106(3), [illegible]

[illegible]

Fan, J. P., Titman, S., & Twite, G. (2012). An international comparison of capital structure and debt maturity choices. Journal of Financial and Quantitative Analysis, 47(1), 23–56.

Flannery, M. J. (1986). Asymmetric information and risky debt maturity choice. The Journal of Finance, 41(1), 19–37.

[illegible] (2008). [illegible] Working Paper. San Diego: University of California. Retrieved from [illegible]

Graham, J. R. (2000). How big are the tax benefits of debt? The Journal of Finance, 55(5), 1901–1941.

Guedes, J., & Opler, T. (1996). The determinants of the maturity of corporate debt issues. The Journal of Finance, 51(5), 1809–1833.

Gul, S., [illegible] (2012). The determinants of corporate debt maturity structure: A case study of Pakistan.

Jiraporn, P., & Kitsabunnarat, P. (2007). Debt maturity structure, shareholder rights, and corporate governance. Journal of Applied Corporate Finance, [illegible]

Johnson, S. A. (1997). An empirical analysis of the determinants of corporate debt ownership structure. Journal of Financial and Quantitative Analysis, 32(1), 47–69.

Kale, J. R., & Noe, T. H. (1990). Risky debt maturity choice in a sequential game equilibrium. Journal of Financial Research, 13(2), 155–166.

Kane, A., Marcus, A. J., & McDonald, R. L. (1985). Debt policy and the rate of return premium to leverage. Journal of Financial and Quantitative Analysis, 20(4), 479–499.

Kirch, G., & Terra, P. R. S. (2012). Determinants of corporate debt maturity in South America: Do institutional quality and financial development matter? Journal of Corporate Finance, 18(4), 980–993.

[illegible] (2011). The determinants of corporate debt maturity structure: Evidence from Czech firms. Czech Journal of Economics and Finance, [illegible]

Miller, M. H. (1977). Debt and taxes. The Journal of Finance, 32(2), 261–275.

Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. The Journal of Business, 34(4), 411–433.

Mitchell, K. (1993). The debt maturity choice: An empirical investigation. Journal of Financial Research, 16(4), 309–320.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. The American economic review, 48(3), 261–297.

———. (1963). Corporate income taxes and the cost of capital: A correction. The American economic review, 53(3), 433–443.

Morris, J. R. (1976). On corporate debt maturity strategies. The Journal of Finance, 31(1), 29–37.

Myers, S. C. (1977). Determinants of corporate borrowing. Journal of financial economics, 5(2), 147–175.

Myers, S. C., & Rajan, R. G. (1998). The paradox of liquidity. The Quarterly Journal of Economics, 113(3), 733–771.

Ooi, J. T. (2000). The debt maturity structure of UK property companies. Journal of Property Research, 17(4), 293–307.

Orman, C., & Köksal, B. (2010). Evolution of debt maturity across the firm size spectrum. [illegible] University Library of Munich.

Ozkan, A. (2000). An empirical analysis of corporate debt maturity structure. European Financial Management, 6(2), 197–212.

Ozkan, A. (2002). The determinants of corporate debt maturity: Evidence from UK firms. Applied Financial Economics, 12(1), 19–24.

Terra, P. R. S. (2011). Determinants of corporate debt maturity in Latin America. European Business Review, 23(1), 45–70.

Scherr, F. C., & Hulburt, H. M. (2001). The debt maturity structure of small firms. Financial Management, 30(1), 85–111.

Schmukler, S. L., & Vesperoni, E. (2006). Financial globalization and debt maturity in emerging economies. Journal of Development Economics, 79(1), 183–207.

Stephan, A., Talavera, O., & Tsapin, A. (2011). Corporate debt maturity choice in emerging financial markets. The Quarterly Review of Economics and Finance, 51(2), 141–151.

Stohs, M. H., & Mauer, D. C. (1996). The determinants of corporate debt maturity structure. The Journal of Business, 69(3), 279–312.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. The Journal of Finance, 43(1), 1–19.

Zheng, X., El Ghoul, S., Guedhami, O., & Kwok, C. C. (2012). National culture and corporate debt maturity. Journal of Banking & Finance, 36(2), 468–488.

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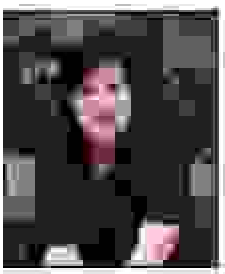

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