

# Corporate Financing & Taxation: A Dynamic Panel Data Modelling

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## Abstract

Do prevailing corporate tax rates have any significant impact on corporate financing decision? This is the most controversial question in corporate finance. Theories suggest a positive impact of corporate tax on debt financing as interest is a tax deductible expense and many empirical studies favour this. However, factors dominating in Emerging economies differ from those in developed economies as the priorities of the two are different. Under situation where external capital inflow plays a vital role in the development of the economy, it would be interesting to see whether corporate tax maintains its dominating position as suggested by earlier studies. This paper examines this issue in detail through dynamic panel data model for firms in India.

**Keywords:** Corporate Financing Decision, Taxation, Emerging Economies, Speed of Adjustment.

## Introduction

How should a firm nourish its investment to get maximum market value for its share? This is the question which was remained unanswered or answered without any deep analysis until 1958. In 1958, tactic of financing got the spotlight of the finance world when Modigliani and Miller presented their seminal study on capital structure irrelevance for firm's value. About a half century has been passed since Modigliani and Miller published their seminal paper and brought capital structure and its influence on firm value in light. During this period

a plethora of research studies have examined the determinants of capital structure as well as the impact of corporate tax on corporate financing decision across the globe.

Debt financing is beneficial due to tax deductibility of interest payment<sup>1</sup>. It means prevailing tax rates persuade more debt financing. However the main concern for the incentive is not only the prevailing tax rate but other cross sectional and time specific factors which affect the corporate incentive for debt financing. It implies that net tax saving of debt financing is a function of statutory tax rates, tax deductions and exemptions<sup>2</sup>, possibility of incurring loss etc. There are also various international factors such as interest rate and external capital flow that affect the corporate financing choice especially in emerging economy where return on capital becomes greater than that in developed world. Moreover, area of financing from where any firm get capital (debt or equity) has been widened and it is not limited to indigenous financing especially for emerging

<sup>1</sup> Interest payments become tax deductible amount as it is deducted from operating income before tax payment but this amount becomes liable to tax in the hand of debt holder depends on their income from rest sources and total income decides tax slab. So, it is a matter of concern. With more tax on debt income debt-holders demand for higher return to adjust after tax return to before tax return.  
<sup>2</sup> Deduction and credits always lower the average tax rate. Carry Backward – Carry Forward of losses provisions would reduce, but not eliminate, the expected value of the corporate tax shield loss on the marginal unit of debt { Mackie-Mason (1990), DeAngelo and Masulis (1980)}.

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economies. To tap overseas capital inflows, policymakers in emerging economies adopt liberal monetary as well as fiscal policies. These policy biases may alter the relation between capital structure and its determinants as suggested by various theories and empirical studies. All these things make financing decision more complicated for firms in emerging economies than firms in developed economies.

The main objective of this paper is to examine the impact of taxation on corporate financing decision of Indian firms using panel data model e.g. static as well as dynamic models. Herewith, other variables which mitigate the taxation impact on corporate financing decisions especially in emerging economies are also studied. One more thing that we examine in this paper is the optimal capital structure<sup>3</sup> i.e. whether firms in India have any target debt ratio towards which they are moving or it is just an arbitrary process. Practically, Target debt ratios\*\* do have significant impact on corporate financing decision as suggested by Graham and Harvey (2001) by getting response from 392 CFOs<sup>4</sup>. Impact of taxation on capital structure decision is explained by static trade off theory where it considered only current year variables as main determinants of corporate financing decision. But this is not the case as the issued debt or target capital structure is also one of the explanatory variables for current year debt equity ratio. We also examine the speed of adjustment with which Indian firms move towards their target debt equity.

The rest of the paper is organised as follows- literature review is provided in the II section. In third section data and methodology will be discussed. Forth section is for discussing the empirical results. Finally, we will discuss the conclusion and present the important suggestion for policy makers and scope for further study.

<sup>3</sup> The trade-off theory says that firms have optimal debt-equity ratios, which they determine by trading off the benefits of debt with the costs (Scott, 1976).

<sup>4</sup> Firms have an optimal or "target" debt-equity ratio. Nineteen percent of the firms do not have a target debt ratio or target range. Another 37% have a flexible target, and 34% have a somewhat tight target or range. The remaining 10% have a strict target debt ratio (Graham and Harvey (2001).

\*\* Firms follow the trade-off theory and target their debt ratio (Graham and Harvey (2001). Target adjustment models predict changes in debt ratios, which depend on the net amount of debt issued (Shyam-Sunder and Myers (1999).

## Literature Review

After criticism of MM 1958 assumptions especially absence of taxation, in 1963 Modigliani and Miller considered the most controversial factor i.e. corporate taxation. MM 1963 finds the value addition effect of debt financing on firm's value as tax deductibility of interest payment add value of tax shield in unlevered firm value to make it equal to levered firm value. If this is the case then 99.9<sup>5</sup> debt financing would be the optimal capital structure as every single unit adds certain amount in firm value. All such concerns trigger research in this area to find answer of the question if debt financing add value in firm value then why big firms of the economy with huge profitability are reluctant to go for debt<sup>6</sup>. Many studies criticize the absolute advantage of debt financing by introducing various costs such as financial distress costs and agency cost and other factors. First, Baxter (1967) presented contrary results for absolute debt financing by introducing possibility of bankruptcy with increasing level of debt financing and various costs associated with bankruptcy<sup>7</sup>. Even Miller (1977) criticizes the relevance of capital structure for firm's value by adding personal tax in his earlier study. Titman and Wessels (1988) considers several determinants which induce a firm to go or not to go for debt financing. Many studies reconsider taxation as main persuader of debt financing. Titman and Wessels (1988), Fischer et al. (1989), Bradley et al. (1984), and Marsh (1982) do not find plausible influence of tax on corporate financing decision while Myers (1984) Gordon and Mackie-mason (1990) have mixed results for tax impact on debt financing. Mackie-Mason (1990), Givoly et al. (1992), Graham (1996), Buettner et al. (2006) and Klapper & Tzioumis (2008) give coherent conclusions for recognizing the importance of taxation and its positive and significant impact on corporate financing decisions. It is not simple to explicitly demonstrate whether tax shield

<sup>5</sup> Baxter (1967) "the Modigliani-Miller proposition amended to take the tax deductibility of interest into account would postulate that . . . the recipe for optimal leverage ... is that companies ought to be financed 99.9 per cent with pure debt!"

<sup>6</sup> Byoun et al. (2008) suggest that firms become debt-free when facing borrowing constraints with favourable equity market conditions.

<sup>7</sup> Warner (1977) measures the cost associated with bankruptcy but there is a significant difference in the magnitude of bankruptcy cost of the two.

really adds something in firm value<sup>8</sup> as there is no explicit proxy for taxation and different studies use different proxies<sup>9</sup> for taxation Klapper and Tzioumis (2008).

The main capital structure theory which demonstrates relation between taxation and capital structure choice is trade off theory. According to this theory, capital structure is determined by the equilibrium of tax benefits<sup>10</sup> of debt financing and costs attached with it.

Taxation system in India has significantly changed over the years with reduction in effective tax rate<sup>11</sup> from 46% in 1997 to 33% in 2011 and various tax exemptions, deductions, and allowances were introduced to attract more capital flow in economy that make fiscal policy more effective for corporate tax decision in emerging economies. However to get information about such company specific factors is very tidy task without access to tax return.

Target or optimal capital structure<sup>12</sup> is discussed by many

studies such as Marsh (1982), Shyam-Sunder & Myers (1999), Fama and French (2002), Flannery and Rangan (2006), Titman and Tsyplakov (2007) and Serrasqueiro & Nunes (1999). Different studies suggests different speed of adjustment towards target capital structure.

Shyam-Sunder and Myers (1999), Fama and French (2002) and Titman and Tsyplakov (2007) suggest slow speed of adjustment of debt equity ratio moving towards target debt equity ratio in the presence of pecking order. While Flannery and Rangan (2006) and Serrasqueiro & Nunes (1999) results show a quick movement towards target capital structure by utilizing partial speed of adjustment and it is about 1/3 of the actual debt equity ratio. Myers (1984) argues that in the world of Pecking order firms do not have leverage targeting or optimal capital structure. Target or optimal capital structure of a firm is function of various determinants which is suggested by various theories and existing studies<sup>13</sup> and companies consider these factors while moving towards their target leverage.

In developed European countries, corporate tax reforms have occurred, albeit either gradually (e.g., France after 1985) or with policy reversions, which complicate the study of a tax effect (e.g., in 2001, Italy substantially reversed the corporate tax reforms of 1997). Similarly, the wave of flat tax reforms in Eastern Europe in the context of tax competition with the aim to boost economic growth and foreign direct investment is difficult to evaluate in terms of firms' capital structure choice since these corporate tax changes happened either too recently to evaluate (e.g., Slovakia in 2004, Romania in 2005) or simultaneously with dramatic overhauls of the personal taxation systems (e.g., Estonia, Latvia and Lithuania in the 1990s). Klapper and Tzioumis (2008)

### **Trends of External Debt Financing and Corporate Tax Rate in India**

Nowadays, the importance of capital structure is more for emerging economies firms where the economy as well as firm are in growing stage and they have huge opportunities to exploit. To make sure optimum utilization

<sup>8</sup> As per MacKie-Mason(1990) tax shields should matter only to the extent that they affect the marginal tax rate on interest deductions. Expected benefits of the expected marginal corporate tax benefit from debt is strictly less than the statutory corporate tax rate. DeAngelo and Masulis (1980). "I know of no study clearly demonstrating that a firm's tax status has predictable, material effects on its debt policy." I think the wait for such a study will be protracted".

<sup>9</sup> Marginal tax rate, incremental tax, effective tax rate, statutory tax rate etc. are proxy for corporate taxation measurement. Tax proxies include nondebt tax shields (Bradley, Jarrell, and Kim, 1984; Titman and Wessels, 1988; Mackie-Mason, 1990;), taxes paid over pre-tax income (Fisher, Heinkel, and Zechner, 1989; Givoly, et al.. 1992), or dummy variables equal to one if a firm has a net operating loss carryforward and equal to zero otherwise. Analogously, most cost of capital calculations effectively use a net operating loss dummy (Graham (1996).

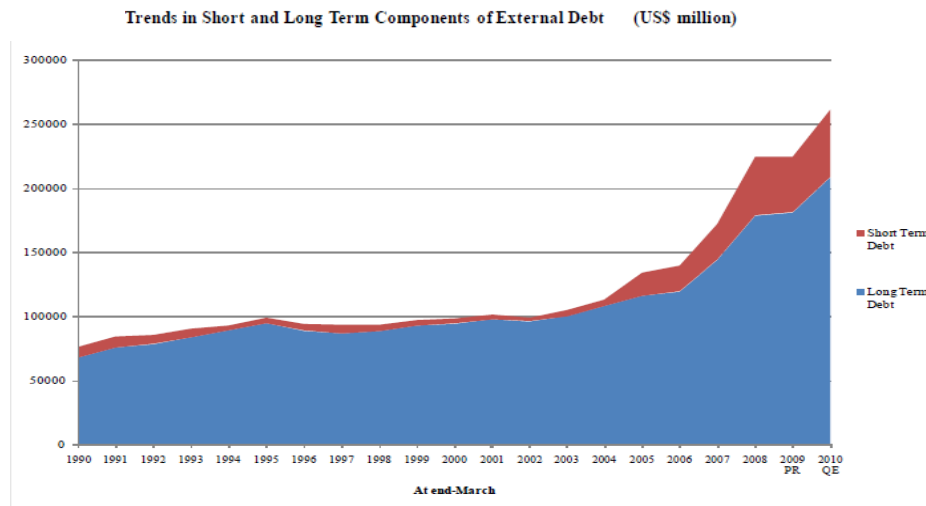
<sup>10</sup> Corporate tax advantage of debt is moderately important in capital structure decisions. The tax advantage is most important for large, regulated, and dividend-paying firms – companies that probably have high corporate tax rates and therefore large tax incentives to use debt (Graham and Harvey (2001)

<sup>11</sup> In the United States, the Tax Reform Act of 1986 had mixed results because the maximum statutory tax rate decreased from 46% in 1986 to 34% after 1988, but simultaneous changes in several tax rules raised the fraction of corporate income taxable at the maximum rate (Gordon and MacKie-Mason, 1990).

<sup>12</sup> Taxes have two off setting effects on optimal capital structure. The deductibility of corporate interest payments pushes firms towards more target leverage, while the higher personal tax rate on debt relative to equity pushes them towards less leverage. Fama and French (2002).

<sup>13</sup> Companies do appear to make their choice of financing instrument as though they had target levels in mind for both the long term debt ratio, and the ratio of short term to total debt. Finally, the results are consistent with the notion that these target levels are themselves functions of company size, bankruptcy risk, and asset composition (Marsh (1982)

Figure 1



Source: Ministry of Finance, GOI status report on External Debt Financing (2010).

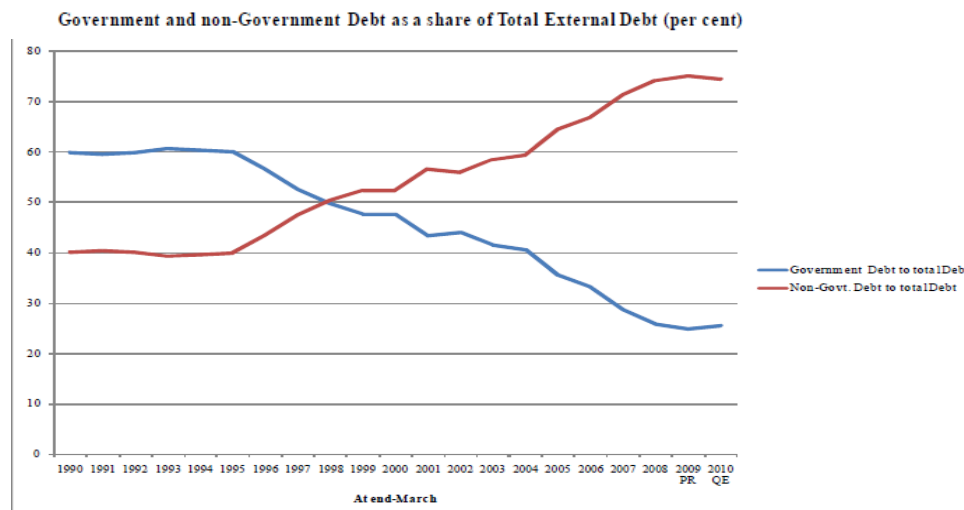
of such untapped opportunities they need huge capital funds for investment purpose and this requirement cannot be fulfilled only from domestic fund/equity capital. Therefore, they go for debt capital which is also a cheaper source of financing. Emerging economies largely depend on external funding and foreign fund<sup>14</sup> whether in debt or equity funding. The trends of external debt flow (short term as well as long term) in India from 1990 to 2010 are given below.

<sup>14</sup> Desai (1998) shows that firms issue foreign debt in response to relative tax incentives.

**Short and Long-term Debt:** Figure 1 shows the increasing trends in short term and long term external debt financing. The rising share of long term debt indicates the increasing participation of the corporate sector in accessing capital markets abroad.

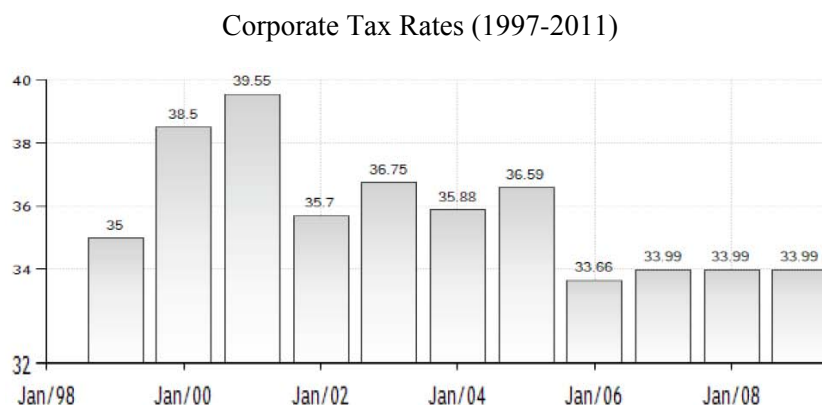
**Government and Non-Government Debt:** figure 2 displaying the increasing share of the non-Government sector in total external debt from around 40 per cent in the first half of the nineties to over 70 per cent in recent years. Thus, the share of the Government has declined from mid-nineties onwards.

Figure 2



Source: Ministry of Finance, GOI status report on External Debt Financing (2010).

Figure 3



Source: Tradingeconomies.com

Corporate Tax rates in India: Figure 3 depicts the declining trend in corporate tax rates. Corporate tax plays vital role in corporate financing decision as interest is a tax deductible amount whereas return to equity is taxable for firm. Therefore, tax shield of Indian firm would decrease with reduction in corporate tax rate *ceteris paribus*.

## Data and Methodology

The sample comprises of all the companies forming part of CNX 500 equity index. The data has been collected for debt equity ratio as the dependent variable and corporate tax, non debt tax shield, personal tax on equity as explanatory variables and some control variables such as profitability, size and tangibility. Financing and Banking companies are deleted from the sample as these companies are covered under regulated categories where capital structure of a firm is directed by the regulator. Therefore, in original sample we have 426 companies. Further two categories are created namely balanced data sample (354 non banking and non financing firms) and unbalanced data sample (426 non banking and non financing firms). The study period covers a comprehensive 15 years period from 1997 to 2011.

Financial data for this study is collected from various sources. CMIE Prowess 4.1 is primarily used for financial and accounting annual data collection of sample firms, while Government as well as Non-Government websites, publications and reports are used for data of macroeconomic factors e.g. external debt flow, statutory tax rates and dividend distribution tax rates etc.

A Panel data analysis (static as well as dynamic using balanced and unbalanced data) is conducted. The static panel data models include pooled OLS regression, fixed effect model and random effect model. Arellano-Bond of Generalized Method of Moments (1991) and OLS dynamic regression with one lagged value of dependent variable are used for dynamic analysis.

A decision is influenced by the composition of many factors instead of only one. It is not an easy task to determine the explicit impact of taxation on capital structure choice. Doing so requires a lot of calculations for various tax deduction, exemptions and available allowance to a firm. Through this paper, we examine the relation between prevailing tax rate and corporate financing decision and the possible factors which mitigate the impact of taxation on corporate financing decision. Net tax shield itself is a function of many factors as given below.

Net tax shield = f (STR, NDTS, Bankruptcy Possibility, availability of internal earning, tax rule & regulation, financial risk, control, type of industry, financial distress costs etc.....).

## Panel Data Models which are used in this paper are as follow:

Static Panel Data Model:

Pooled OLS model -

$$D/E_{it} = \alpha_1 + \beta_1 STR \rho_1 + \beta_2 (ETR - STR) \rho_2 + \beta_3 DDT \rho_3 + \beta_4 DTS \rho_4 +$$

$$D/E_{it} = \alpha_1 + \beta_1 STR \rho_1 + \beta_2 (ETR - STR) \rho_2 + \beta_3 DDT \rho_3 + \beta_4 DTS \rho_4 + \text{controls} + \delta Y_{i,t} + \varepsilon_{it}$$

Others:-

- Fixed Effect Model
- First Difference Model
- Random Effect Model

For these results are directly collected from stata 10.0.

Dynamic Panel Data Model: simple OLS with one lagged value of previous year debt equity ratio.

$$D/E_{i,t+1} = \alpha + \gamma D/E_{(i,t-1)} + \sum_{j=7}^k \beta_j X_{jit} + \delta Y_{i,t} + \varepsilon_{it}$$

$$\sum_{j=7}^k \beta_j X_{jit} = \beta_1 STR \rho_1 + \beta_2 (ETR - STR) \rho_2 + \beta_3 DDT \rho_3 + \beta_4 DTS \rho_4$$

$$\sum_{j=7}^k \beta_j X_{jit} = \beta_1 STR \rho_1 + \beta_2 (ETR - STR) \rho_2 + \beta_3 DDT \rho_3 + \beta_4 DTS \rho_4$$

$$\sum_{j=7}^k \beta_j X_{jit} = \beta_1 STR \rho_1 + \beta_2 (ETR - STR) \rho_2 + \beta_3 DDT \rho_3 + \beta_4 DTS \rho_4 + \text{controls}$$

$$\sum_{j=7}^k \beta_j X_{jit} = \beta_1 STR \rho_1 + \beta_2 (ETR - STR) \rho_2 + \beta_3 DDT \rho_3 + \beta_4 DTS \rho_4 + \text{controls}$$

$$\sum_{j=7}^k \beta_j X_{jit} = \text{Observed effect}$$

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$X_j =$  Observed explanatory variables

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$\delta Y_{it} =$  Unobserved explanatory variables

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$\rho_i =$  dummy variables  $\rho_i =$  dummy variables

$$\sum_{p=1}^s \gamma_p Z_{pi} = \text{controls}$$

Further Arellano – Bond (1991) Generalized Method of Moments with one and two steps is used with the help of stata 10.0

### Empirical Results

Empirical results of static panel data explain the impact of corporate taxation on corporate financing decision of firms. Table 3 results show that STR which is proxy of corporate taxation has negative relationship<sup>15</sup> with leverage under all models which is contrary to the existing static trade off theory and empirical studies which argue positive influence of corporate tax on debt financing owing to tax

<sup>15</sup> Thomas W. Down (1993) shows negative relationships between tax shield and corporate leverage.

**Table 1: Operational Definition of variables**

S. No.	Variables	Operational Definition
1.	Capital Structure(D/E)	Book value <sup>1</sup> of Debt Equity ratio at the end of march for each year.
2.	Corporate Taxation <sup>a</sup> (STR)	Statutory tax rate (STR) prevailing in economy in particular year.
3.	Investment Tax Credits <sup>b</sup> (ETR-STR)	Excess of STR over average tax rate* in particular year (mentioned as ITR).
4.	Personal Tax on Equity <sup>c</sup> (DDT)	Dividend Distribution Tax (DDT) rates prevailing at the end of each year.
5.	Depreciation Tax Shield <sup>d</sup> (DTS)	Ratio of depreciation allowed to fixed assets value .
6.	Control Variables Size Profitability Tangibility	Natural logarithm of sales value in each year. Ratio of profit after tax (PAT) over total assets value. Ratio of fixed assets over total assets value.

\* Average Tax rate is calculated as *Corporate Tax amount/Profit before Tax*.

<sup>a</sup> STR is a dummy variable which takes value 1 for firms with profit in the concerned year and by 0 for firms facing loss in the concerned year since benefit of tax deductibility available when firm earn profit and become liable for payment on tax in the year. In case of loss there is no tax liability for firm therefore no tax benefit in year in which a firm face loss.

<sup>b</sup> ITC is a dummy variable which takes value 1 for positive ITC or where STR greater than ATR, otherwise by 0.

<sup>c</sup> Multiplied by dummy 1 when dividend paid or proposed otherwise by 0 since dividend distribution tax is levied only when firm decides to distribute its profit to shareholders.

<sup>d</sup> Depreciation tax shield mitigates the tax shield impact only when firms are liable to pay tax otherwise not. Therefore, DTS is multiplied by proxy 1 for positive PBIT otherwise by 0.

<sup>1</sup> Book value measures might give better insight to corporate capital structure objective than would market value measures of leverage, which are highly sensitive to changes in the level of stock prices.

deductibility of interest on debt. Results are statistically significant and coefficient values vary between -1.5 (first difference model) and -3.3 (pooled OLS).

Incremental Tax rate ( i.e. ETR-STR) which is one of the elements of non debt tax shield depicts a positive relationship with debt equity ratio and nature of result is consistent for all static models. It is consistent with the results of Mackie-Mason (1990), Bradley et al. (1984), and Titman and Wessels (1988), which suggest that incremental tax rate has insignificant or a positive coefficient. Other element of Non debt tax shield<sup>16</sup> i.e. depreciation tax shield (DTS) result is consistent with the theoretical prediction that DTS should have negative impact on debt financing as it reduce tax shield<sup>17</sup>. Results of all models are same except the result of first difference where it shows positive relationship between DTS and leverage but this result is statistical insignificant.

Personal tax on equity income which is measured by dividend distribution tax (DDT) has a positive relation with corporate leverage. It is consistent with MM (1963) argument that personal tax on equity income has positive impact on debt financing.

All control variables namely size, profitability and tangibility results are consistent with the existing theories and empirical studies. Profitability shows a negative relation with debt financing which is consistent with pecking order argument of Myers (1984) and Myers and Majluf (1984). Size and tangibility have positive influence on corporate financing decision as also reported by Titman and Wessels (1988), Fama and French (2002). Although, significance level of results under different model show a mixed response. There is no significant

<sup>16</sup> Bradley et al. (1992) finds that debt is positively related to non debt tax shield. The general point of the De Angelo and Masulis article is that company specific optimal debt policies may arise because companies have varying abilities to deduct interest expense. DeAngelo and Masulis (1980) argue that non debt tax shields are a substitute for the interest deduction associated with debt; therefore, the optimal amount of debt in a firm's capital structure is a decreasing function of NDTs. Deduction and credits always lower the average tax rate. Carry Backward – Carry Forward of losses provisions would reduce, but not eliminate, the expected value of the corporate tax shield loss on the marginal unit of debt. Mackie-Mason (1990), DeAngelo and Masulis (1980)

<sup>17</sup> Down (1993) findings suggest that firms with relative high DTS tends to have high leverage.

difference between the results of unbalanced data sample results and balanced data results except the degree of coefficient.

Table 3(b) demonstrate that there is no problem of positive or negative *multi-collinearity* in the model as suggested by collinearity statistics i.e. *variance inflating factor* (VIF) values are less than 2.00 or tolerance values are about 1.00. However, serial correlation in the given data series is indicated by lower value of *Durbin-Watson test* i.e. 1.079. The *Breusch and Pagan Lagrange multiplier test* result suggests that simple OLS is not appropriate. It means there is evidence of significant differences across firms, therefore it would be appropriate to use *random effect regression model*. Whereas *Hausman test* favours for using *fixed effect model*. One of the important explanation is about *Adjusted R<sup>2</sup>* results which indicate that the given explanatory variables explain about 14 percent variation in dependent variable i.e. debt equity ratio. *R<sup>2</sup>* values are significantly large in case of between *R<sup>2</sup>* while significantly small in case of within *R<sup>2</sup>*. Here also no significant discrepancies in the results of unbalanced data and results of balanced data sample. The low value of adjusted *R<sup>2</sup>* implies that the given explanatory variables do not have large influence on corporate financing. Thus, we can say that there are other factors that explain the variation of dependent variable and they mitigate the impact of other determinants of corporate debt financing especially in emerging economies.

Table 4 provides correlation matrix for various variables used in the study. Corporate tax rate is negatively correlated with dependent variable i.e. debt equity ratio. It implies increase in debt financing with decline in corporate tax rate which is contrary to trade off theories and several empirical studies. ITC measurement of non debt tax shield depicts positive association with debt equity ratio. DDT which is proxy for personal tax on equity return is positively correlated with debt financing and it is consistent with earlier studies. Depreciation tax shield has negative impact on corporate financing as it mitigates the tax shield impact on debt financing. Other control variables have same association with debt equity ratio as suggested by various capital structure theories. All results are statistically significant except size and dividend distribution tax. One important correlation result is relationship between STR and profitability with highest degree of correlation i.e. 0.3163.

**Table 2: Descriptive Statistic**

Variables	Balanced		Unbalanced	
	Mean	Std. Dev.	Mean	Std. Dev.
DE	1.03	1.82	1.04	1.83
STR	0.347	0.08	0.34	0.08
ITC	0.17	0.13	0.17	0.13
DDT	0.10	0.07	0.10	0.07
DTS	0.10	0.07	0.10	0.07
Size	8.71	1.89	8.74	1.80
Profitability	0.07	0.09	0.07	0.44
Tangibility	0.31	0.19	0.31	0.19

**Table 3 (a): Static Panel Data Models Results.**

Variables	Balanced Data Sample a				Unbalanced Data Sample a			
	OLS	Fixed Effect	Random Effect	First Diff. *	OLS	Fixed Effect	Random Effect	First Diff. *
Constant	1.2680 (0.000)	1.4860 (0.002)	1.3480 (0.000)	- 0.028 (0.267)	0.9156 (0.000)	1.2833 (0.003)	1.0556 (0.000)	- 0.035 (0.128)
STR	- 3.3306 (0.000)	-2.6600 (0.002)	- 2.8218 (0.000)	- 1.532 (0.000)	- 2.0774 (0.003)	-2.0222 (0.020)	- 2.0138 (0.002)	- 1.606 (0.000)
ITC	2.4816 (0.000)	1.4442 (0.000)	1.7533 (0.000)	0.470 (0.088)	2.5604 (0.000)	1.3892 (0.000)	1.6381 (0.000)	0.570 (0.031)
DDT	0.6776 (0.019)	0.5392 (0.071)	0.5614 (0.028)	0.273 (0.213)	0.4628 (0.096)	0.4514 (0.094)	0.4459 (0.075)	0.513 (0.017)
DTS	- 1.4029 (0.000)	- 0.5356 (0.205)	-0.9776 (0.001)	0.163 (0.749)	- 0.5638 (0.033)	- 0.4759 (0.258)	- 0.5093 (0.090)	0.239 (0.582)
Size	0.0728 (0.000)	0.0128 (0.736)	0.0376 (0.056)	0.068 (0.229)	0.0655 (0.000)	0.0223 (0.459)	0.0455 (0.023)	0.167 (0.000)
Profitability	- 4.1709 (0.000)	- 1.9788 (0.003)	-2.4912 (0.000)	- 1.548 (0.000)	- 5.2336 (0.000)	- 3.3293 (0.000)	-3.8128 (0.000)	- 0.061 (0.097)
Tangibility	0.7571 (0.000)	0.7999 (0.002)	0.8203 (0.000)	0.008 (0.976)	0.8713 (0.000)	0.8425 (0.004)	0.9090 (0.000)	1.688 (0.000)

\* All above results are calculated with the help of Stata 10.0 except the results of first difference regression model for which SPSS 16.0 is used.

\*\* all results produced in above table are with robustness.

<sup>a</sup> If same units of observation in a cross-sectional sample are surveyed across number of years, the resulting observations are described as forming a panel or longitudinal data set. A panel data is described as balanced if there is an observation for every unit of observing for every time period, and as unbalanced if some observations are missing. While using unbalanced data one need to take the note of possibility that the causes of missing observations are endogenous to the model. For balanced, the resulting data set may not be representative of its population.

Table 5 depicts the dynamic panel data model results. We use the *Arellano-Bond GMM model* with one step and two steps. Besides it we also used *simple OLS* and *fixed effect model* with one lagged value of dependent variable as an explanatory variable. The simple OLS shows that coefficient value of one lagged value of D/E ratio as an explanatory variable is 0.55 which implies that actual D/E ratio of India firms towards target D/E ratio is about 44.48% in one year. Herewith, result of fixed effect model for one lagged value of dependent variable as an explanatory variable is 0.31 it means the speed of adjustment towards target ratio according to fixed effect should be about 69 %. These two adjustment speeds are

very high and indicate a rapid movement of Indian firms towards their target or optimal debt ratio.

The results of Arellano-Bond GMM panel data model demonstrate that the coefficient value of  $D/E_{t-1}$  is about 0.26 for both one step as well as two steps model which implies that the speed of adjustment<sup>\*\*\*</sup> is about 74%. In India firms close 74% of the gap between current and target D/E ratio within one year.

Nature of other explanatory variables is same as suggested by static panel data model. The results show that Target debt level is a function of taxation, non-debt tax shield, firm's size, profitability and tangibility.

**Table 3 (b): Static Panel Data Tests Results (Balanced Data Results).**

	OLS	Fixed Effect	Random Effect	First Difference
Collinearity*	No <sup>a</sup>			No
Durbin – Watson*	1.079 <sup>#</sup>			2.591 <sup>#</sup>
Adj. R <sup>2</sup>	0.137			0.009
Within R <sup>2</sup>		0.0443	0.0438	
Between R <sup>2</sup>		0.3020	0.3156	
Overall R <sup>2</sup>		0.1296	0.1346	
Hausman Test		77.52 <sup>b</sup>		
		(0.000)		
N	5310	5310	5310	4956
Breusch and Pagan			2705.89 <sup>c</sup>	
LM Test			(0.000)	

<sup>a</sup> Variation Inflating Factor (VIF) and tolerance values indicates that there is no multicollinearity problem.

<sup>b</sup> Hausman test basically examine whether the unique error are correlated with the repressors, the null hypothesis is they are not correlated. If the *p* value of is less than 0.05 use fixed effect model

<sup>c</sup> We reject the null hypothesis that non-observable individual effects are not relevant. We conclude that a pooled OLS regression is not the most appropriate way of carrying out analysis of the relationship between debt and its determinants.

\* Results of SPSS 16.

<sup>#</sup> Durbin Watson test results indicate that there is presence of serial correlation in the given data and it needs to remove through appropriate methodology.

**Table 3 (c): Static Panel Data Tests Results (Unbalanced Data Results)**

Mul. Collinearity*	No				No
Durbin – Watson*	1.175				2.601
Adj. R <sup>2</sup>	0.138				0.031
Within R <sup>2</sup>		0.0538	0.0535	0.0416	
Between R <sup>2</sup>		0.2530	0.2618	0.2859	
Overall R <sup>2</sup>		0.1355	0.1378	0.1287	
Hausman Test		Yes			

Note: There is no major variation in the results of balanced data and unbalanced data results

**Table 4: Correlation Matrix of Balanced data results**

	DE	STR	ITC	DDT	DTS	Size	Profitability	Tangibility
DE	1							
STR	-0.1556*	1						
ITC	0.1327*	0.4002*	1					
DDT	0.0115	0.0417*	0.0127	1				
DTS	-0.1884*	0.2535*	-0.0616*	0.0202	1			
Size	0.0161	0.1175*	-0.1347*	-0.250	0.0405*	1		
Profitability	-0.2884*	0.3163*	-0.0049	0.0416*	0.2700*	0.0764*	1	
Tangibility	0.1814*	0.0149	0.2587*	-0.0065	-0.2965*	0.0268	-0.1756*	1

Note: \* Statistically significant at 0.01.

\*\*\* The adjustment speed of debt equity ratio of India firms is significant that is about 74%. It is a sound value of adjustment speed towards target capital structure according to the results of other studies which measure the adjustment speed of capital structure About 33% in Portuguese firms\*, 53% and 28% for German firms and French firms respectively (Kremp et al; 1999), 59% for U.S firms (Shyam-Sunder and Mayers, 1999), Miguel and Pindado (2001) estimates 79% of Spain and 57% for U.K. is estimated by Ozkan (2001).

**Table 5: Dynamic Panel Data model Results**

Variables	Balanced Data Sample				Unbalanced Data Sample	
	Arellano – Bond GMM		OLS	Fixed Effect	Arellano – Bond GMM	
	One step	Two steps	OLS <sub>t-1</sub>	Fixed Effect <sub>t-1</sub>	One step	Two steps
D/Et-1	0.2632 (0.000)	0.2613 (0.000)	0.5552 (0.000)	0.3110 (0.000)	0.3264 (0.000)	0.3228 (0.000)
STR	-1.0103 (0.050)	-0.6819 (0.000)	-1.9571 (0.000)	-2.3467 (0.000)	-0.8966 (0.058)	-0.4628 (0.004)
ITC	0.6652 (0.066)	0.5827 (0.000)	1.1588 (0.000)	1.0584 (0.000)	0.4454 (0.165)	0.4910 (0.000)
DDT	0.2621 (0.399)	0.1458 (0.002)	0.4210 (0.125)	0.4497 (0.097)	0.2762 (0.317)	0.1733 (0.003)
DTC	-0.2274 (0.731)	-0.2136 (0.270)	-0.5936 (0.047)	-0.5177 (0.264)	-0.0928 (0.875)	-0.1225 (0.539)
Size	-0.2877 (0.000)	-0.2198 (0.000)	0.0377 (0.001)	0.0055 (0.000)	-0.1544 (0.000)	-0.1097 (0.000)
Profitability	-2.5879 (0.000)	-3.0096 (0.000)	-2.5063 (0.000)	-1.8581 (0.000)	-2.8419 (0.000)	-3.3598 (0.000)
Tangibility	0.4324 (0.178)	0.1903 (0.020)	0.2868 (0.016)	0.4302 (0.025)	0.2814 (0.359)	-0.0208 (0.853)
	1391.48				1169.14	
	(0.000)				(0.000)	
Sargan Test					(0.000)	
R <sup>2</sup>			0.3802	0.3699		
F			380.93	85.14		
			(0.000)	(0.000)		

## Conclusions

Contrary to the trade-off theory prediction and various empirical studies which suggest positive impact of corporate tax on firm's financing decisions, our results show a negative and significant impact of corporate tax on firm's capital structure in India. It means that the tax benefits attached with debt financing is not considered as main determinant of capital structure and there are other factors which persuade debt financing of Indian firms. In this direction, external debt flow is a significant factor which mitigates the corporate tax impact. External debt flow has been increasing despite the decline in average tax rates in India. It may be because of interest rate gap between emerging and developed economies. This gap is so large that it turned the impact of taxation on corporate financing decision. Therefore we can say that external

debt financing is one of the most important factors which mitigates or even overrule the taxation impact on corporate financing decision besides the non debt tax shield. Dividend tax which was introduced in 1997-98 worked against equity financing and hence was followed with more debt financing by corporate in India.

According to the dynamic analysis, 'speed of adjustment' of actual debt towards the optimal level of debt for companies in India is about 74% (this speed under pooled OLS regression is about 45% and 69% in case of fixed effect model). Contrary to Flannery and Rangan (2006), Fama and French (2002), Shyam-Suder and Myers (1999), Marsh (1982) this level of speed of adjustment is very high. High level of adjustment speed means a close relationship between the levels of actual debt to optimal level of debt.

The results have important policy implications. It suggest that any attempt to reduce debt financing by lowering corporate tax rates may not produce desired results in India.

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