*Vidyasagar University Journal of Commerce*
*Vol. 21, 2016/ISSN 0973-5917*

# DEBT FINANCING AND SHAREHOLDERS' RETURN: A STUDY OF BSE 500 COMPANIES

**Kalpataru Bandopadhyay***
**Koustav Roy****

## Abstract

*In determining relationship between level of debt and profitability, the earlier empirical studies mostly considered the level of debt or leverage ratio as dependant variable and profitability as one of the independent variables without conducting any test of exogeneity among variables. The introduction of fresh capital may have an impact on profitability but not necessarily instantaneously. The most of the analysis did not consider the lag of level of debt. In this context, this paper seeks to find out the relationship between debt financing and shareholders' return in Indian context afresh. Granger Causality has been applied to ascertain the direction of relationship among variables. The fixed effect model has been applied on the panel data of BSE 500 companies during the period 2000 to 2015. The paper observed that there is statistically significant relationship between debt-equity ratio and shareholders' return.*

***Key Words:*** *DE, ROE, Panel Data, Fixed Effect Model, Granger Causality Test*

## Introduction

The trade off theory of capital structure states that the incorporation of debt in capital structure has positive impact on book value of the firm as long as debt is cheaper to capital. Under the assumption of no-tax regime, Modigliani & Millar (1958) observed that capital structure does not affect the value of the firm as incorporation of debt increases the cost of capital to nullify the positive impact created. However, Modigliani & Millar (1962) argued that due to the tax deductibility of interest payment, shareholder's income and value of the firm may increase along with the debt level. This theoretical argument could not be supported by most of the empirical studies.

There are hundreds of papers around the world like Jensen & Meckling (1976), Kester (1994), Rajan & Zingales (1995), Fama & French (2002) that do not empirically support

*Professor, Department of Commerce with Farm Management, Vidyasagar University
E-mail: rana4312000@yahoo.com
**Research Scholar, Department of Commerce with Farm Management, Vidyasagar University
E-mail:roy.koustav85@gmail.com

either the trade-off theory or tax-shield theory. There are so many literature on impact of debt on profitability of a company in the context of different countries. Myers & Majluf (1984) popularised the Pecking order theory that suggests to arrange fresh capital for a firm, the internal sources are preferred to issuance of debt. They predicted an inverse relationship between profitability and leverage. In spite of that, they preferred issuance of debt over issuance of equity because according to them fresh equity issuance is 'riskier' than issuance of debt instruments. Titman & Wessels (1988) applied factor analytic model to observe cost and benefits associated with capital structure decision are small due to transaction cost. Additional evidence relating to the importance of transaction costs is provided by the negative relation between measures of past profitability and current debt levels. Abor (2005) conducted a study on financing decision and profitability of firm in the context of listed companies in Ghana Stock Exchange. He observed a statistically significant positive relation between short term debt and profitability where as he observed negative relationship between long term debt and profitability. Chen & Strange (2006) conducted a study of over nine hundreds firms in China in 2013. They observed tax does not influence debt ratio and that profitability is negatively related to capital structure at a significant level. Booth et. al. (2001) analysed capital structure choices in ten developing countries and provide evidence that these decisions are affected by same variables as in developing country.

There are a few research studies in Indian context. Majumdar & Chibber (1999) analysed the firm level data to find negative relation between debt level and performances of firm. Khasnobis-Guha & Bhaduri (2002) conducted a study on balanced panel of 697 firms during 1990-1998 to observe negative relationship between profitability and both long term and short term debt both. In another study, Majumdar & Sen (2010) find similar result. Mishra (2011) conducted a study of capital structure on PSUs in manufacturing sector and observed after tax profitability is inversely related to leverage.

The most of the studies conducted earlier including all those discussed above were based on cross sectional analysis and did not consider the lag of debt level. They also did not apply exogeneity test of the variables to understand the direction of possible influence among the variables. In this background, this paper seeks to find the relationship between debt financing and share holders' return applying Panel data analysis in Indian context.

**Framework of the Model**

There are various forms of shareholders' return. This paper would deal with intrinsic rate of return earned by the shareholders. Again, to examine the relationship between debt level and profitability from the view point of shareholders, we might consider return on equity (ROE).

The impact of tax shield could be had with the change in PAT in absolute term and ROE in relative term. However, the profitability gets impacted by other variables as well and may be even more importantly. For such reason, EBIT has been considered as control variable which indicates the level of profitability but not the impact of tax shield.

ROE= (EBIT - Interest – Tax)/Shareholders' equity

Except interest and tax EBIT is proportional to ROE

We therefore propose EBIT as the most appropriate control variable in the proposed model:

ROE = a + b. EBIT + c. D/E ratio + e

(a, b, c are constant terms and e=error term)

For panel data analysis, to develop a model with different companies and different time periods we have:

$ROE_{i,t} = a + b.\ EBIT_{i,t} + c.\ D/E\ ratio_{i,t} + e$

i= i th. company; t = t th year

On the basis of result of granger causality test, lag in independent variable would also incorporated

$ROE_{i,t} = a + b.\ EBIT_{i,(t-n)} + c.\ D/E\ ratio_{i,(t-n)} + e$

n= level of lags = 0,1,2,...

**Data & Methodology**

Primarily, we have considered all BSE 500 companies during 2000-01 to 20014-15. However, the result of financial year 2014-15 was not available for some companies till the date data was collected. In some cases, the company has started business or incorporated as public limited company after financial year 2000-01. So, the data set was not a balanced one. The capital structure of finance companies is not comparable to other companies. As such the finance companies have not been considered in the data set.

Now let us discuss about the variables that were considered. The debt-equity ratio indicates the extent of debt financing. The debt-equity ratio and ROE has been considered for debt financing and shareholders' return whereas EBIT was considered for control variable. The consideration of tax at personal level arises if we are to determine actual gain at shareholders' hand or value of the firm. Millar (1977) observed tax advantage of debt financing at the firm level is exactly offset by the tax disadvantage of debt at personal level. In this paper we have

not considered tax at personal level because the study is focussed on impact of debt financing on shareholders' return.

The debt-equity ratio as mentioned in the annual report has been considered. So, debt–equity consists of short term debt as well as long term debt. The nature of both may be different but both are interest bearing securities and may yield interest related tax-shield. As such, to achieve the objective of this study, differentiation may not be essential. In this study, the intrinsic value of return has been considered. So, return on equity (ROE) was considered as a measure of return from the view point of shareholder. The tax rate for all the companies has been considered at the highest rate. There are some companies which have incurred losses during the period of study. However, those companies are to carry forward the losses in the subsequent year and to set off on accrual of profit. It is to be mentioned that accumulated loss of any company was not more than accumulated profit of the company during the period of study. However, the impact of present value has not been considered in such cases. Primarily, an attempt was made to detect the relationship between the ROE and d/e through bi-variate analysis. Apart from tax-shield and level of debt, ROE may be influenced by many other factors as suggested by many researchers, e.g. size, research and development expenses, non-debt tax shield and many more. However, the impact of those factors in ROE may be captured by earnings before interest & tax (EBIT) as well. So, EBIT has been considered as control variable. The data was collected from Ace Equity database.

In determining the relation between profitability and debt ratio many authors has considered industry classification as dummy variables. In this paper, no such classification was included in the analysis because of the reason that there is also a substantial variation among company variables within an industry and in panel data analysis each company is considered a separate entity.

At the outset, the nature of the data has been ascertained. The normality of the data series and variation among the data has been checked through descriptive statistics. The stationarity of different series through Panel Unit root tests and on the basis of results of majority of the cases the final decision was arrived. The granger causality test was applied to understand the possible direction of relation between two variables. From the two-way ANOVA table it could be observed that there is significant variation across the time series and also along cross section series. The variation suggests application of Panel data analysis. The pooled regression has not been run as the method does not take care of cross-section variation or variation due to period. In this context, two-way fixed effect model was considered. As the data set was an unbalanced panel, random effect model would not be applicable. To check the suitability of

the model, Redundant fixed effect model has been applied. The analysis was conducted through the econometrics packages E-views 6.

**Data Analysis**

From the descriptive statistics of raw data spanning over fifteen years with 476 companies we found wide variation as demonstrated difference between minimum value and maximum value. There are many observations in all three types of variables which lie beyond +/- 3 sigma level.

**Table 1: Descriptive Statistics**

| | ROE | DE | PBIT |
|---|---|---|---|
| Median | 16.57581 | 0.497151 | 152 |
| Maximum | 763.1202 | 1936.696 | 155659 |
| Minimum | -3134.02 | -500.392 | -4415.18 |
| Std. Dev. | 57.47308 | 24.80367 | 5252.841 |
| | | | |
| Jarque-Bera | 6.50E+08 | 8.20E+09 | 18618168 |
| Probability | 0 | 0 | 0 |
| | | | |
| Observations | 7080 | 7080 | 7080 |

*Source: Computed by the authors*

The median value of PBIT is around ten times than that of ROE and thirty times more than that of DE. Thus analysis on the basis of raw data may cause scale effect problem. Most importantly, the Jarque –Bera test statistics suggest that all three variables may not follow normal distribution. However, under Gauss-Markov assumptions, the regression conducted on large sample may be considered valid. In our study, primarily there were 476 data cross section data points and 15 time series data points with a total of 7080 observations and may be considered as large sample.

To carry out our analysis further we have taken natural logarithm of all three variables. Thus analysis with LROE, LPBIT and LDE may not have scale effect problem. The stationarity of the data series should be examined to proceed further analysis. If data is non-stationary then the OLS cannot be applied and the cointegration technique is to be applied. To examine stationarity, we are to conduct panel unit root test. Two types of Fisher-Chi square test, Levin, Lin & Chu t test and Im, Pesaran and Shin W-stat was employed.

**Table 2: Panel unit root test (Summary Table)**

| Panel unit root test: Summary | | | | | | |
|---|---|---|---|---|---|---|
| | ROE | | DE | | LPBITD | |
| Automatic selection of lags based on SIC: 0 to 2 | | | | | | |
| Newey-West bandwidth selection using Bartlett kernel | | | | | | |
| Method | Statistic | Prob.** | Statistic | Prob.** | Statistic | Prob.** |
| Null: Unit root (assumes common unit root process) | | | | | | |
| Levin, Lin & Chu t* | -149.503 | 0 | -24916 | 0 | -56.4377 | 0 |
| Null: Unit root (assumes individual unit root process) | | | | | | |
| Im, Pesaran and Shin W-stat | -27.5686 | 0 | -2080.62 | 0 | -10.7504 | 0 |
| ADF - Fisher Chi-square | 2063.96 | 0 | 2263.61 | 0 | 1383.12 | 0 |
| PP - Fisher Chi-square | 2006.14 | .0 | 2319.67 | 0 | 1735.8 | 0 |
| ** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. | | | | | | |

*Source: Computed by the authors*

It is observed that p-value for all the cases i.e. in all methods and for all variables are statistically significant. So, we may reject the null hypothesis. There may not be any unit root in any of the data series. Thus the Panel Unit Root test suggests that the data are stationary at I(0). So, we do not need to conduct panel co-integration. We could conduct different Panel Data models with autoregressive least square method.

Before moving into any regression with least square method we must ensure the direction of probable causation to understand which variables are dependant and which variable are independent. In almost all papers where the objective of the study is to determine determinants of capital structure, without conducting any test of exogeneity for any variables, debt -equity ratio has been considered as dependant variable and among other variables in many cases profitability in different forms has been considered as independent variables. In those studies, in most cases, they concluded that debt ratio and profitability are inversely related. According to trade off theory and also tax- shield theory, debt is used to increase shareholders' return. On the other hand, according to Pecking order theory, debt is used if cash flow out of retained earnings is not enough to finance the capital requirement. In this context, it is to be ascertained for our study, among ROE, DE and PBIT which one is dependant variable and which one is independent variable.

**Table 3: Granger Causality Test**

| Pairwise Granger Causality Tests | | | |
|---|---|---|---|
| Sample: 2000 – 2015 | Lags: 3 | | |
| | | | |
| Null Hypothesis: | Obs | F-Statistic | Prob. |
| | | | |
| LDE does not Granger Cause LROE | 3902 | 3.77395 | 0.0102 |
| LROE does not Granger Cause LDE | | 14.8922 | 1.00E-09 |
| | | | |
| LDE(-1) does not Granger Cause LROE | 3602 | 3.94532 | 0.008 |
| LROE does not Granger Cause LDE(-1) | | 18.7887 | 4.00E-12 |
| | | | |
| LDE(-2) does not Granger Cause LROE | 3283 | 4.7604 | 0.0026 |
| LROE does not Granger Cause LDE(-2) | | 13.4076 | 1.00E-08 |

*Source: Computed by the authors*

From the Table-3 above, it is evident that LDE, LDE (-1) and LDE (-2) granger cause LROE. However, LROE does not granger cause LDE in any of the lags above. There are several research papers like Rajan & Zingales (1995), Chen & Strange (2006) which considers regression equation of DE on Profitability (Return on Assets) and may have possibly arrived at mis-specified model.

To understand the relationship between ROE and Debt Equity with PBIT as control variable we are to conduct panel data analysis. However, the pooled regression model was not attempted as the process not only disregards time effect on the variables but also ignores the cross section variation of the data. Thus two-way fixed effect panel regression model was applied to arrive at the relationship. The robustness of the model would also be tested. In the model, the relationship between ROE and DE and its one lag data has been sought to establish.

**Table 4: Two-way Fixed Effect Panel Regression Model**

| Dependent Variable: LROE | | | | |
|---|---|---|---|---|
| Periods included: 14 | | Cross-sections included: 463 | | |
| | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| | | | | |
| C | -0.75464 | 0.097539 | -7.736775 | 0 |
| LDE | -0.04141 | 0.011101 | -3.730387 | 0.0002 |
| LDE(-1) | 0.036899 | 0.01325 | 2.78489 | 0.0054 |
| LDE(-2) | 0.028497 | 0.011239 | 2.535418 | 0.0113 |
| LPBIT | 0.620849 | 0.017099 | 36.30848 | 0 |
| | | | | |
| R-squared | 0.601003 | | F-statistic | 13.22008 |
| Adjusted R-squared | 0.555542 | | Prob(F-stat.) | 0 |

*Source: Computed by the authors*

The model above was statistically significant with adjusted R squared was over 55%. All the variables LDE, LDE (-1), LDE (-2) and LPBIT influences LROE significantly. The relationship between ROE and DE is negative. However, the relationship between ROE and one year and two year lag value of DE is positive.

To check the robustness of the cross section fixed effect and time related fixed effect model Redundant Fixed Effect Test has been conducted. In table 5, F test and Chi-square test was conducted in relation to period fixed effect and cross section fixed effect.

**Table 5: Redundant Fixed Effects Tests (Summary Result)**

| Test cross-section and period fixed effects: | | | |
|---|---|---|---|
| Effects Test | Statistic | d.f. | Prob. |
| Cross-section F | 10.33322 | -47,54,679 | 0 |
| Cross-section Chi-square | 3710.149 | 475 | 0 |
| Period F | 114.5817 | -1,44,679 | 0 |
| Period Chi-square | 1524.634 | 14 | 0 |
| Cross-Section/Period F | 11.91502 | -48,94,679 | 0 |
| Cross-Section/Period Chi-square | 4183.161 | 489 | 0 |

*Source: Computed by the authors*

The above table demonstrate the summary result of Redundant Fixed Effect Test. It is observed that cross section F and Cross Section Chi-square both are statistically significant. Again, Period F and Period Chi square are also significant. Finally, both cross section and period effect together are also significant. Thus it may be assumed that fixed effect model is well fit for given data set.

**Interpretation of result**

From the analysis, we understand that there is negative relation between debt financing and shareholders' return in the initial year. However, ROE is positively impacted by DE at some lags. The debt can be taken any time during the period. It is very much possible that the debt may not have taken just at the beginning of the year or even in the first quarter of the year. Even if debt is taken in the later part of the year, d/e in the balance sheet shows as if for the full year but EBIT or ROE do not get a complete year's impact of new debt capital. However, in the subsequent years, the picture is different. Then ROE is the result of total employed capital including the debt of previous year. There is another possibility for such results. The debt capital, be it short term or long term, is taken mainly to finance the short-term or long-term requirement of the company. Sometimes old debt is utilised to redeem by fresh debt. The impact of expansion of debt on profitability may not be instantaneous. It may take some time to yield the complete result out of introduction of any new capital including debt capital. But, due to increase in debt capital, there would be having some interest cost high may cast negative impact on ROE. However, subsequently, debt capital could yield higher ROE. In case of redeeming old debt, there could be two types of redemption. Those are (i) to avail better conditions of repayment or rate of interest (ii) without being able to meet old debt, to avail loan even at a stricter condition. In the first case, the borrower company may even sacrifice initially (e.g. in the form of penalty for prepayment etc.) to avail future gain. So, gain for introduction of debt may be visible for subsequent years. In second case, stricter terms would negatively influence the ROE. However, there would be very few companies which would borrow to redeem old debt at stricter terms and may not to affect a large sample.

**Conclusion**

The objective of the study is to determine the relationship between debt –equity ratio and roe in the context of BSE 500 companies during last fifteen years. The panel data analysis was conducted. The significance of the study is that it considered the lag in debt financing and also checked the possible direction of influence among the variables through Granger Causality Test which the earlier study hardly cared about. The study demonstrates that the debt financing influences shareholders' return positively. So this study yields similar result to that of Graham (2000). However, in our study, we further observe that the year in which debt was incorporated might observe a negative impact. However, the debt-equity ratio influences ROE subsequent years. Even, considering the time value of money for all the years in our study, the positive

impact of debt is more than negative impact on ROE. Thus, it may be concluded that the debt financing generates higher return for shareholder possibly due to the benefit out of tax shield availed on account of interest. Thus the study seeks to support the Modigliani & Millar (1963).

## References

Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana.*The Journal of Risk Finance*, 65, 438 – 445.

Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital Structures in Developing Countries. *Journal of Finance*, 56, 87–113.

Bowman, J. (1980). The Importance of a Market Value Measurement of Debt in Assessing Leverage. *Journal of Accounting Research*, 18, 242-54.

Brandley, M., Jarrel, G. A., & Kim, H. E. (1984). On the existence of optimal Capital Structure: Theory and Evidence. *Journal of Finance*, 39, 857-80.

Chen, J., & Strange, R. (2006). The Determinant of Capital Structure: Evidence from Chinese Listed Company. *Economic Change & Restructuring*, 38, 11-33.

Fama, E., & French, K. (2002). Testing trade-off and pecking order theory about dividend and debt. *Review of Financial Studies*, 15, 1–33.

Fischer, E. H., & Zechner, J. (1989). Dynamic Capital Structure Choice: Theory and Test. *Journal of Finance*, 44, 19-40.

Graham, J. (2000). How Big are the Tax Benefits of Debt? *Journal of Finance*, 55, 1901-41.

Guha-Khasnobis, B., & Bhaduri, S. (2002). Determinants of Capital Structure in India1990-1998: A Dynamic Panel Data Approach. *Journal of Economic Integration*, 17(4), 761-776.

Jensen, M., & Meckling, W. (1976). Theory of the firm: managerial behaviours, agency cost and ownership structure. *Journal of Financial Economics*, 3, 305–360.

Kester, C. (1994). Industrial groups as systems of contractual governance. *Oxford Review of Economic Policy*, 8, 24–44.

Majumdar, S., & Chibber, P. (1999). Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance. *Public Choice*, 98, 287–305.

Majumdar, S., & Sen, K. (2010). Corporate Borrowing and Profitability in India. *Managerial and Decision Economics*, 31(1), 33–45.

Millar, M.H. (1977). Debt & Taxes. *Journal of Finance*, 33(2), 261-275.

Mishra, C.S. (2011). Determinants of Capital Structure – A Study of Manufacturing Sector PSUs in India. International Conference on Financial Management and Economics, IPEDR, 11, 1-16.

Modigliani, F., & Miller, M. (1958). The Cost of Capital, Corporation Finance, and the theory of investment. *American Economic Review*, 48, 261–297.

Modigliani, F., & Miller, M. (1963). Corporate income taxes and the cost of capital: a correction. *American Economic Review*, 53, 433–443.

Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13, 187–221.

Rajan, R., & Zingales, L. (1995). What do we know about capital structure choice? Some evidence from international data. *Journal of Finance*, 50, 1421–1460.

Titman, S., & Wessels, R. (1988). The Determinants of Capital Structure Choice. *Journal of Finance*, 43(1), 1-19.