

# Impact of Financial Leverage on Financial Risk of Corporate Sector- A Study of Private Sector Companies during Period of Post Liberalization

## Abstract

Indian economy is developing economy where growth of country is depends on corporate sector. But the growth of corporate sector depends on its financial sources and their proper utilization. This paper is focused on impact of financial leverage on financial risk of corporate sector in India a study of private sector companies after liberalizations. Main objective of this paper is to know the impact of financial leverage on financial risk of private sector companies.

**Keywords:** Financial Leverage, Financial Risk, Liberalization, Capital Structure.

## Introduction

In the age of growing complexity in corporate world, character of financial decision has undergone a basic transformation. One of the difficult and debatable areas which has emerged during the years is financing decisions, that is to determine optimum capital structure. It is important that the mix of different forms of capital should be such a way that the weighted average cost of capital is minimum and value of the firm is maximum. Decision regarding capital structure is vital for a firm because designing of capital structure has influence over cost of capital, financial risk borne by share holder, earnings per share, return on equity and value of firm. As such the choice for capital structure is one of the major policy decisions taken by business enterprise. Generally, capital structure and financial structure are considered the same but both are different. One of the basic issues relating to capital structure decision is whether change in financing mix affects value of firm and cost of capital. It is often suggested that capital structure should be so determined that can maximize long run value of a company's share.

In financial management it refers to investment in fix assets and designing of capital structure of a firm in such as way so that fixed costs are present. It may be defined as use of fixed charge securities in capitalization of company. Leverage not only tends to magnify shareholder's return under favorable conditions but also exposes to financial risk because the use of debt increases variability in shareholders return and profitability. Financial risk is a crucial issue for both manager and researcher. Manager has to control financial risk for long term development of companies. Financial risk of the firm/ company determined by how it finances these investments. It is primarily influenced by the level of financial gearing , interest coverage, operating leverage and cash flow adequacy. It is associated with capital structure of a company. It arise when a company depends upon loan to finance its activities. A company with no debt has no financial risk. The extent of financial risk depends on leverage of firm capital structure. Proper financial planning and other financial adjustments can be used to correct this risk and which are as such is controllable.

## Objectives of Study

To measure the impact of financial leverage on financial risk among sample companies during the period of post liberalization.

## Research Methodology

The present research is based on secondary data. In order to achieve the objective, a sample of 25 private sector companies has been obtained, which has been collected from annual reports of the different companies, prowess, official directory of Bombay stock exchange etc. In

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order to measure financial risk of companies ratio of Interest coverage has been used and leverage has been defined as follows.

Leverage 1 = Total Debt/ Total Assets

Leverage 2 = Short Term Debt/Equity

Leverage 3 = Debt/ Equity

Leverage 4 = Long Term Debt /Equity

For the purpose of data analysis a panel data analysis method has been applied. The reference period of study is 2000 to 2017.

#### **Limitation of Research**

It is based on secondary data and limited to only up to availability of annual reports companies.

#### **Review of Literature**

Mandelkar and Rhee (1984) have examined The Impact of The Degree of Operating and Financial Leverage on Systematic Risk of Common Stock. The study was based on a sample of 255 manufacturing firms during the period of 1957 to 1976. The unique aspect of this study is to explicit introduction of degree of financial and operating leverages in investigation the joint impact of both assets structure and capital structure on systematic risk.

Bhole and Mahakud (2004) did the work on Trend and Determinants of Corporate Capital Structure: A Penal Data Analysis. The main objective of the study was to determine the trend and determinants of capital structure of joint stock companies in India. The variables of the study were firm size, liquidity, tangibility, profitability etc. For the purpose of analysis researcher used panel data analysis technique. They concluded that the variables like cost of borrowing, cost of equity, size of firm, collective value of asset, liquidity and non debt tax are major determinants of the corporate capital structure in India.

M Jaydev (2006) conducted the work on the topic Predictive Power of Financial Risk Factors: An Empirical Analysis of Default Companies. The main objective of the study was to provides an empirical evidence on the significance of financial risk factors of default companies.

Overbeck Ludger, et al. (2007) have done the work on Mathematic in financial risk management. The paper gives an overview of mathematical models and methods used in financial risk management, the main area of application is credit risk. A brief introduction explains the mathematical issues arising in the risk management of a portfolio of loans. The paper continues with a formal overview of credit risk management models and discusses axiomatic approached to risk measurement. They close with a section on dynamic credit risk models used in the pricing of credit derivatives. Mathematical techniques used stem from probability theory, statistics, convex analysis and stochastic process theory.

Al-Qudah and Laham (2013) have analyzed The Effect of Financial Leverage and Systematic Risk on Stock Returns in the Amman Stock Exchange: An Analytical Study - Industrial Sector. The objective of study was evaluate the relationship between stock returns in industrial companies listed on Amman Stock Exchange (ASE) and each of the systematic risk and financial leverage

Nafooti, et al.(2013) have conducted a study on Factors Affecting Risk and Return of Financial Stocks in Stock Exchange. The main objective the study was to find a relationship between systematic risk of stocks in Tehran Stock Exchange and several important variables. The variables of the study include the operating leverage, financial leverage, risk, efficiency and firm size. In order to data analysis and presentation researcher used multiple regression and correlation method. They opposed to the theory of investment in securities. They concluded that the stock systemic risk does not accept significant impact studied variables in the Tehran Stock Exchange.

Jahirul Hoque, et al.(2014) have did the research on the topic Impact of Capital Structure Policy on Value of the Firm - A Study on Some Selected Corporate Manufacturing Firms Under Dhaka Stock Exchange. The main objective study was to critically examine the impact of capital structure policy on value of firm for some selected firms under Dhaka Stock Exchange in Bangladesh. The research was based on both primary and secondary data of 20 manufacturing firms operating under Dhaka Stock Exchange. The total period of study was five years from 2008 to 2012.The selected variables of the study were financial risk, return on investment, return on equity, debt equity and profitability ratio.

Sowjanya and Kothari (2016) have done the work on the topic Analysis of Risk and Return: A Comparative Study of Banking and Auto Sector Stocks in India. The main objective of the study was to examine risk and return relationship of sample companies during the period 2011 to 2015. In order to describe and summarize data researcher used statistical tool regression analysis and T test. The result of the study showed that there was no difference in the performance of banking and auto sector stocks.

Kasmawati (2016) has done the work on the topic Tobin's Q as a Proxy for Corporate Governance Variables and Explanatory Variables in Manufacturing Companies in Jakarta Stock Exchange. The main objective of study was to determine how companies can realize good performance to become competitive in a global business population of manufacturing sample companies listed on the Indonesia Stock Exchange in 2012 -2014.

#### **Analysis**

#### **Impact of Financial Leverage on Financil Risk of Private Sector Companies during The Period of Post Liberlisation**

**Table 6.1 VIF Table of private sector companies for leverage1 during the period of post liberalization**

| Variable | VIF  | 1/VIF    |
|----------|------|----------|
| FS       | 2.73 | 0.366771 |
| EBIT     | 2.22 | 0.450158 |
| TANG     | 1.78 | 0.561342 |
| NDTS     | 1.46 | 0.685831 |
| LEV 1    | 1.40 | 0.713862 |
| CR       | 1.28 | 0.783383 |
| GR       | 1.04 | 0.959853 |
| Mean VIF | 1.70 |          |

Table 6.1 has been used to presents the values of VIF test for panel regression of private sector companies during the period of post

liberalization. The result shows that the value for independent variables are below 3, hence, shows absence of multi co linearity in data.

**Table 6.2 Hausman's Test of Private Sector Companies Leverage1 during the Period of Post Liberalization**

|       | (b)<br>fe  | (B)<br>Re  | (b-B)<br>Difference | sqrt(diag(V <sub>b-V<sub>B</sub></sub> ))<br>S.E. |
|-------|------------|------------|---------------------|---|
| LEV 1 | -3.804669  | -4.242328  | 0.4376589           | 0.425627  |
| TANG  | -.6415403  | -0.441069  | -0.2004713          | 0.3054788   |
| FS    | 0.1905442  | 0.0590954  | 0.1314488           | 0.0891104   |
| EBIT  | -0.0000016 | 0.0000105  | -0.0000119          | 0.00000395  |
| GR    | -0.1124614 | -0.1126247 | 0.0001632           | 0.0013331   |
| CR    | 0.0376849  | 0.0642444  | -0.0265595          | 0.0207073   |
| NDTS  | -4.429603  | 0.7724887  | -5.202092           | 4.291139  |

**Test: Ho: difference in coefficients not systematic**  
**chi2 = 1.04**  
**Prob>chi2 = 0.9839**

i.e. difference in coefficient is not systematic. The result of Hausman's test favors random effect model for interpretation of result of private sector companies during the period of post liberalization, therefore, random effects regression modal has been used for interpretation.

The Hausman's test result in table 6.2 shows chi square value is 1.04 with p-value 0.9839 which is more than .05 level, hence, accept null hypothesis

**Table 6.3 Random-Effects Regression Results for Effect of Financial Leverage (Leverage1) on Financial Risk of Private Sector Companies during The Period of Post Liberalization**

| <b>R-sq: within = 0.2153</b><br><b>between = 0.5273</b><br><b>overall = 0.3801</b> |            | <b>Number of obs = 450</b><br><b>Number of groups = 25</b><br><b>Obs per group: min = 18</b><br><b>Avg = 18.0</b><br><b>Max = 18</b><br><b>Wald chi2(7) = 106.56</b><br><b>Prob &gt; chi2 = 0.0000</b> |        |
|--|------------|--|--------|
| FR   | Coef.      | z  | P> z   |
| LEV 1  | -4.242328  | -6.34  | 0.000* |
| TANG   | -0.441069  | -0.58  | 0.564  |
| FS   | 0.0590954  | 0.27   | 0.787  |
| EBIT   | 0.0000105  | 0.95   | 0.342  |
| GR   | -0.1126247 | -6.84  | 0.000* |
| CR   | 0.0642444  | 1.29   | 0.198  |
| NDTS   | 0.7724887  | 0.10   | 0.922  |
| cons   | 3.181645   | 3.36   | 0.001  |

\* Significant at 1% level

The table 6.3 result of random effect regression. The table shows the value of R square (overall) is 0.3801 which means 3.80 percent of variation in financial risk has been explained with this model over the period under the study. The value of Wald chi square test is 106.56 with p value 0.000, which is significant at .05 level, hence the modal has been statistically significant. Table also shows that leverage measured by total debt to total assets has negative relation with financial risk and has been found statistically insignificant with p value 0.000. The variables tangibility has been found negative and insignificant relation and firm size, earnings before interest and taxes, current ratio and non debt tax shield has been found positive and insignificant relation with financial risk, but growth has been found negative and significant relation with financial risk.

**Table 6.4 VIF Table of Private Sector Companies for Leverage 2 during the Period of Post Liberalization**

| Variable | VIF  | 1/VIF    |
|----------|------|----------|
| FS       | 2.57 | 0.389687 |
| EBIT     | 2.14 | 0.466334 |
| TANG     | 1.48 | 0.677142 |
| NDTS     | 1.45 | 0.687632 |
| CR       | 1.23 | 0.813715 |
| LEV2     | 1.10 | 0.905181 |
| GR       | 1.02 | 0.977841 |
| Mean VIF | 1.57 |          |

Table 6.4 has been used to presents the values of VIF test for panel regression of private sector companies during the period of post liberalization. The result shows that the value for independent variables are below 3, hence, shows absence of multi co linearity in data.

The Hausman's test result in table 6.5 shows chi square value is 6.31 with p-value 0.3897 which is more than .05 level, hence, accept null hypothesis i.e. difference in coefficient is not systematic. The result of Hausman's test favors random effect model for interpretation of result of private sector companies during the period of post liberalization, therefore, random effects regression modal has been used for interpretation.

**Table 6.5 Hausman's Test of Private Sector Companies for Leverage 2 during The Period of Post Liberalization**

|      | (b)<br>fe | (B)<br>Re  | (b-B)<br>Difference | sqrt(diag(V_b-V_B))<br>S.E. |
|------|-----------|------------|---------------------|-----------------------------|
| LEV2 | -3.093285 | -3.502824  | 0.4095386           | 0.2643756                   |
| TANG | -1.280724 | -1.478923  | 0.1981983           | 0.2872715                   |
| FS   | 0.4842108 | 0.4179783  | .0662325            | 0.0691404                   |
| EBIT | -0.000010 | -0.0000031 | -0.0000073          | 0.00000323                  |
| GR   | -0.111489 | -0.1144053 | 0.0029155           | 0.0003598                   |
| CR   | 0.0378502 | 0.0709643  | -0.0331141          | 0.0181812                   |
| NDTS | -8.461632 | -3.165146  | -5.296486           | 3.819312                    |

**Test: Ho: difference in coefficients not systematic**

**chi2 = 6.31**

**Prob>chi2 = 0.3897**

The table 6.6 result of random effect regression. The table shows the value of R square (overall) is 0.2172 which means 21.72 percent of variation in financial risk has been explained with this model over the period under the study.

**Table 6.6 Random-Effects Regression Results for Effect of Financial Leverage (Leverage 2) on Financial Risk of Private Sector Companies during the Period of Post Liberalization**

| R-sq: within = 0.1725<br>between = 0.3353<br>overall = 0.2172 |             | Number of obs = 450<br>Number of groups = 25<br>Obs per group: min = 18<br>avg = 18.0<br>max = 18<br>Wald chi2(7) = 68.28<br>Prob > chi2 = 0.0000 |          |
|---|-------------|---|----------|
| FR  | Coef.       | z   | P> z     |
| LEV 2   | -3.502824   | -2.86   | 0.004*   |
| TANG  | -1.478923   | -1.90   | 0.058*** |
| FS  | 0.4179783   | 1.88  | 0.060*** |
| EBIT  | -0.00000319 | -0.28   | 0.780    |
| GR  | -0.1144053  | -6.73   | 0.000*   |
| CR  | 0.0709643   | 1.35  | 0.176    |
| NDTS  | -3.165146   | -0.37   | 0.708    |
| Cons  | 1.414444    | 1.49  | 0.137    |

\*\* Significant at 5% level

\*\*\* Significant at 10 % level

The value of Wald chi square test is 68.28 with p value 0.000, which is significant at .05 level, hence the model has been statistically significant. The result of table also shows that leverage measured by short term debt to total assets has negative relation with financial risk and has been found statistically significant with p value 0.004. The variables tangibility, growth has been found negative and significant relation and firm size has been found positive and significant relation with financial risk. The variable earnings before interest and taxes, non debt tax shield has been depicted negative and insignificant relation.

Table 6.7 has been used to presents the values of VIF test for panel regression of private sector companies during the period of post liberalization. The result shows that the value for independent variables are below 3, hence, shows absence of multi co linearity in data.

**Table 6.7 VIF Table of Private Sector Companies for Leverage3 during the Period of Post Liberalization**

| Variable | VIF  | 1/VIF    |
|----------|------|----------|
| FS       | 2.48 | 0.403485 |
| EBIT     | 2.14 | 0.466342 |
| NDTS     | 1.45 | 0.687765 |
| TANG     | 1.41 | 0.710061 |
| CR       | 1.23 | 0.814079 |
| LEV 3    | 1.03 | 0.971132 |
| GR       | 1.02 | 0.978924 |
| Mean VIF | 1.54 |          |

The Hausman's test result in table 6.8 shows chi square value is 22.80 with p-value 0.0004 which is less than .05 level, hence, reject null hypothesis i.e. difference in coefficient is not systematic. The result of Hausman's test favors fixed effect model for interpretation of result of private sector companies during the period of post liberalization, therefore, fixed effects regression modal has been used for interpretation.

**Table 6.8 Hausman's Test of private sector companies for leverage3 during the period of post liberalization**

|      | (b)<br>fe | (B)<br>Re | (b-B)<br>Difference | sqrt(diag(V_b-V_B))<br>S.E. |
|------|-----------|-----------|---------------------|-----------------------------|
| LEV3 | 0.0000904 | 0.0001225 | -0.0000321          | .                           |
| TANG | -1.620495 | -1.888828 | 0.2683332           | 0.2899657                   |
| FS   | 0.6671847 | 0.5974987 | 0.0696861           | 0.0587633                   |
| EBIT | -0.000015 | -0.000007 | -0.0000084          | 0.0000029                   |
| GR   | -0.107863 | -0.111077 | 0.0032146           | .                           |
| CR   | 0.0305184 | 0.0716731 | -0.0411547          | 0.018224                    |
| NDTS | -6.052704 | -2.647909 | -5.787913           | 3.924714                    |

**Test: Ho: difference in coefficients not systematic**

**chi2 = 22.80**

**Prob>chi2 = 0.0004**

The table 6.9 result of fixed effect regression.

The table shows the value of R square (within) is

**Table 6.9 Fixed-effects Regression results for effect of financial leverage (leverage3) on financial risk of private sector companies during the period of post liberalization**

| <b>R-sq: within = 0.1582</b><br><b>between = 0.1218</b><br><b>overall = 0.1322</b> |            | <b>Number of obs = 450</b><br><b>Number of groups = 25</b><br><b>Obs per group: min = 18</b><br><b>Avg = 18.0</b><br><b>max = 18</b><br><b>F(7,418) = 7.87</b><br><b>Prob &gt; F = 0.0000</b> |          |
|--|------------|---|----------|
| FR   | Coef.      | t   | P> t     |
| LEV3   | 0.0000904  | 0.37  | 0.711    |
| TANG   | -1.620495  | -1.96   | 0.051*** |
| FS   | 0.6671847  | 3.00  | 0.003*   |
| EBIT   | -0.0000158 | -1.34   | 0.181    |
| GR   | -0.1078632 | -6.30   | 0.000*   |
| CR   | 0.0305184  | 0.54  | 0.586    |
| NDTS   | -6.052704  | -0.65   | 0.517    |
| cons   | 0.3672831  | 0.41  | 0.686    |

\* Significant at 1% level

\*\* Significant at 10 % level

The value of F test is 7.87 with p value 0.000, which is significant at .05 level, hence the modal has been statistically significant. The result of table also shows that leverage measured by total debt to equity has positive relation with financial risk and has been found statistically significant with p value 0.711. The variables tangibility, growth has been found negative and significant relation and firm size has been found positive and significant relation with financial risk. However earnings before interest and taxes, non debt tax shield has been found negative and insignificant relation and current ratio has positive and insignificant relation with financial risk.

Table 6.10 has been used to presents the values of VIF test for panel regression of private sector companies during the period of post liberalization. The result shows that the value for independent variables are below 3 , hence , shows absence of multi co linearity in data.

0.1582 which means 15.82 percent of variation in financial risk has been explained with this model over the period under the study.

**Table 6.10 VIF Table of Private Sector Companies for leverage 4 during the Period of Post Liberalization**

| Variable | VIF  | 1/VIF    |
|----------|------|----------|
| FS       | 2.48 | 0.403579 |
| EBIT     | 2.15 | 0.465028 |
| NDTS     | 1.45 | 0.687722 |
| TANG     | 1.41 | 0.710079 |
| CR       | 1.23 | 0.814006 |
| LEV4     | 1.04 | 0.964247 |
| GR       | 1.02 | 0.978922 |
| Mean VIF | 1.54 |          |

The Hausman's test result in table 6.11 shows chi square value is 7.04 with p-value 0 .2175 which is more than .05 level , hence, accept null hypothesis i.e. difference in coefficient is not systematic. The result of Hausman's test favors random effect model for interpretation of result of private sector companies during the period of post liberalization, therefore, random effects regression modal has been used for interpretation.

**Table 6.11 Hausman's Test of private sector companies for leverage 4 during the period of post liberalization**

|      | (b)       | (B)        | (b-B)      | sqrt(diag(V <sub>b</sub> -V <sub>B</sub> )) |
|------|-----------|------------|------------|---|
|      | fe        | Re         | Difference | S.E.  |
| LEV4 | 0.0001802 | 0.0002507  | -0.0000704 | .   |
| TANG | -1.619714 | -1.887685  | 0.2679711  | 0.2899294                                   |
| FS   | 0.6666294 | 0.5970053  | 0.0696241  | 0.0588349                                   |
| EBIT | -0.000015 | -0.0000072 | -0.0000084 | 0.00000298                                  |
| GR   | -0.107855 | -0.1110602 | 0.0032053  | .   |
| CR   | 0.0304796 | 0.0715225  | -0.041043  | 0.0182238                                   |
| NDTS | -6.06437  | -0.2923512 | -5.772019  | 3.923707                                    |

Test: Ho: difference in coefficients not systematic

chi2 = 7.04

Prob>chi2 = 0.2175

**Table 6.12 Random-Effects Regression Results for Effect of Financial Leverage (Leverage 4) on Financial Risk of Private Sector Companies during The Period of Post Liberalization**

|   |             |  |         |
|---|-------------|--|---------|
| R-sq: within = 0.1548<br>between = 0.2532<br>overall = 0.1758 |             | Number of obs = 450<br>Number of groups = 25<br>Obs per group: min = 18<br>Avg = 18.0<br>Max = 18<br>Wald chi 2(7) = 59.00<br>Prob > chi2 = 0.0000 |         |
| FR  | Coef.       | z  | P> z    |
| LEV4  | 0.0002507   | 0.53   | 0.594   |
| TANG  | -1.887685   | -2.43  | 0.015** |
| FS  | 0.5970053   | 2.78   | 0.005*  |
| EBIT  | -0.00000723 | -0.63  | 0.526   |
| GR  | -0.1110602  | -6.42  | 0.000*  |
| CR  | 0.0715225   | 1.35   | 0.177   |
| NDTS  | -0.2923512  | -0.03  | 0.972   |
| Cons  | 0.4441161   | 0.50   | 0.620   |

\* Significant at 1% level

\*\* Significant at 5% level

The table 6.12 result of random effect regression. The table shows the value of R square (within) is 0.1582 which means 15.82 percent of variation in financial risk has been explained with this model over the period under the study. The value of Wald chi square test is 59.00 with p value 0.000, which is significant at .05 level, hence the model has been statistically significant. The result of table also shows that leverage measured by long term debt to equity has positive relation with financial risk and has been found statistically insignificant with p value 0.594. The variables tangibility, growth has been found negative and significant relation whereas firm size has been found positive and significant relation with financial risk. Earnings before interest and taxes, non debt tax shield has been depicted negative and insignificant relation whereas current ratio has positive and insignificant relation financial risk.

#### Conclusion

In case of private sector companies during the period of post liberalization it has been observed leverage 1 and leverage 2 have negative and significant relation with financial risk however leverage 3 and leverage 4 shows positive and insignificant relation. However in case of control variables, leverage 2 (short term debt /equity), leverage 3 and leverage 4 have negative and significant relation with tangibility, however in case of growth all four ratios shows negative and significant relation. In case of firm size leverage 2, leverage 3

and leverage 4 have shown positive and significant relation.

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