Financial Risk and Firms' Value: An Empirical Study on BSE500 Company

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ABSTRACT

In the present competitive business environment the goal of each and every firm is to create and maximize value of an organisation. To achieve this goal company configure its capital structure and operating activity with deep interest. The type of capital structure generates the financial risk of a business organisation. The main objective of this study is to find out the relationship between debt-equity ratio and PE (as a proxy of firms' value) as well as evaluate the effect of financial risk on firms' value. A sample of 87 firms listed in BSE500 for a period of 15 years (2001-2016) was used. Data of selected firms were sourced from publish annual reports of copany. In order to achieve the set objectives, I have employed Regression Analysis and correlation analysis. Adjusted R2 is carried on to test level of significant of regression line. The Ordinary Least Square (OLS) methods is used for data analysis and for testing hypothesis. The study revealed that there is no significant relationship between financial risk and firms' value but debt equity ratios have significantly low effect on firms' value (PE) and equity return (ROE).

Keywords: PE Ratio,ROE,Financial Risk,Debt-Equity Ratio.

INTRODUCTION:

Indian economy is the growing economy which has been liberalising and converging with international economy where numbers of economic policy such as tax rate, tax type and bank interest rate has been changing for attracting domestic and foreign investor who invest their money in different company security. But Due to huge competition in Indian business environment the profit margin of maximum firms has been decreasing over the time. So the objective of everyone have changed from profit maximisation to value maximisation of its investment .To achieve this goal investor likes to invest their money in such a company where risk is low and return and controlling power is high. To fulfill this objective the management configure its capital structure by using tax advantageous fund. Debt financing is a widely used mode of financing around the India. Beside its simplicity, the average interest rate of loan is decreasing than before, which may lead to decreasing the WACC of firms and offer an incentive to use debt finance in company capital structure. Now the question is whether fix charge bearing capital help to increase value of firm in INDIA or can it able to enhance ROE of company in INDIA. There have number of views in for and against this view. The basic resign of this difference is due to different types of economy all over the world. For example the M&M (1958) capital structure incoherence theorem shows us gearing have no impact on the value of a firm, but later they shows debt financing has an impact on the value of a firm if interest is tax deductible expenses. Not only that there have more worked which are ambiguous for debt and equity finance respectively. Different study on financial risk and value of firm and financial performance shows negative and positive relation respectively. Huang & Song (2006) in their work found a negative effect of long term debt on profitability as measured by the return on assets. Some researchers found that debt has a positive effect on financial performance such as Abor (2005). While others research work found a negative effect of debt financing on financial performance

such as Ebaid (2009); Huang & Song (2006) etc. According to the trade off theory, Modigliani and Miller (1963) found out that there has a difference between the value of a leveraged firm and that of an unleveraged firm. Myers and Majluf (1984) found that the firm likes to bring lone finance over the equity finance when required external financing.In the signalling theory researcher (Ross, 1977; Heinkel, 1982; Stien, 1992) shows that a firm with good futures will raise new capital through lone financing, whereas firm with bad prospects arrange fund through equity source. Firms with different financial quality incurred different bankruptcy costs when its uses lone fund, In general, firms with good financial condition may incur lower bankruptcy costs than those with bad financial condition. Therefore, we can assume that the companies with better financial situation may have more positive leverage impact on firm values than those with worse financial quality. Nevertheless, as we know there have many empirical research papers on portfolio risk , market risk and on risk management in and outside India but due to lacking in current empirical study in India, leading to a gap on this important element of risk factor which can disrupt a firm or economy completely. I have explores influnceses of this contextual variable, financial risk and gearing ratio on firm value in current Indian economy. This is my motivation of this article.

LITERATURE REVIEW:

Aggarwal et.al. (2008) made a study on the relationship of firm value and leverage on a global perspective. They documented that leverage is generally value-decreasing among high growth firm globally but the value impact of financial leverage among low-growth organisation varies across national business conditions. They pointed out that debt is value-decreasing among low growth US firm but value enhancing outside the US.

Connell and Servaes (1995) empirically investigated the relationship between corporate value, leverage and equity ownership where they found negative correlation between leverage and value of high-growth firm and positively correlation with leverage for 'low-growth' firms.

Rayan (2008) conducted a study on financial leverage and firm value of healthcare sector where he found out a significant positive correlation between the debt-equity ratio and the price earning ratio.He shows that 29.95% of the PE ratio was explained by the debt-equity ratio of healthcare sector.

Study of Abazari et al. (2014) found that the external risks such as the risk of the market and the economy have an impact on the firm's value and operating risk.

Akintoye (2008) had tried to enlighten the sensitivity of firm performance to the capital structure on some selected food and beverage companies in Nigeria. The outcome shows that performance indicators to turnover (Earninig Per Share and Earnings Before Interest and Taxes, Dividend Per Share) and the measures of leverage (Degree of Financial Leverage, Degree of Operating Leverage and Dividend Per Share) are significantly sensitive.

A study on relationship among culture, capital structure and firm performance was undertaken by Gleason et al. (2000). They uses 14 European countries retailers firm data and found out that capital structures differ depending on the cultural classification of retailers. Moreover there result also shows that retailer performance is not depending on the cultural influence but the capital structure will influence the performance of the retailer firm.

Modern capital structure theory started in the year 1958, when Modigliani and Miller (1958) first found out Capital Structure Irrelevance theory where he said that the business value and weighted average cost of capital (WACC) is unaffected by the capital structure of the organisation. However M&M perfect market assumptions (such as no transaction costs, no taxes, symmetric information and identical borrowing rates, and risk free debt) are contradictory to the operations in the real world. So Modigliani and Miller (1963) revised their original M&M assumption and considered tax shields effect on the value of geared firm. They show that when corporate tax laws allow the deductibility of interest payments, the market value of an organisation is an increasing function of leverage. Miles and Ezzell (1980) , Harris and Pringle (1985), Ruback (2002), Damodaran (1994) , Fernandez (2004) use different model to find out leverage effect on firm value where from I can confirm that no matter whether the model consider the cost and risk of the leverage or not, the present value of the tax shields is always positive so the values of a leveraged firm are greater than that of the unleveraged firm always.

Kim(1978) and Stiglitz (1972) examined the association of the bankruptcy costs and the capital structure where they found out that when marginal tax shield benefit is equals to marginal bankruptcy costs then organisation value reaches its maximum and at this point an optimal capital structure exists.

Cheng and Tzeng (2011) applied the Generalized Method of Moment (GMM) to estimate the effect of financial leverage on organisation values. They Usages 645 company's data (2000-2009) listed in Taiwan Securities Exchange (TSE). The empirical results shows, if there have no bankruptcy probability the values of leveraged organisation are greater than an unleveraged firm. Secondly, If the advantage and cost of debt simultaneously consider, the leverage is significantly positively related to the firm value if firm' optimal capital structure does not present. Thirdly, the positive influence of gearing to the organisation value tends to be stronger when the firm financial quality is good.

This finding can help firm to take decision on debt finance to maximize the organisation value.

Yoon and Jang (2005) presents an empirical study on the relationship between return on equity (ROE), financial leverage and size of firms in the Hotel and restaurant industry for the period 1998 to 2003 using OLS regressions. Research results shows that during the test period business size had a more dominant effect on ROE of hotel and restaurant firms than use of debt. Results also suggest that regardless of having lower financial risk, smaller restaurant firms were significantly more risky than larger organisation.

From the above literature survey I build the two hypotheses. One is financial risk or DE have impact on the value of firm and other is financial risk has significant effect on the ROE of firm.

RESEARCH METHODOLOGY:

Sample:

The sample (consisted of 87 companies) in this study selected randomly listed in BSE500. The data were collected from audited annual reports that were available at capital market line which can be found at S Equity. For the purpose of accurate analysis, I cropped the sample through the following ways, firstly, I deleted all the banking firms that did not have a DEBT EQUITY RATIO and, secondly, I have deleted a few of observations that included negative values for one of those variables.

The Statistical Model:

In this study, I use pooling data to estimate the estimator and test the above hypothesis using pooled cross-section and time-series data. Liner regression model is use. First of all I examine the autocorrelation, multi-co-linearity and Homos-Kedasticity problem with the help of D-W, factors analysis and Kolmogorov-Smirnov & Shapiro-Wilk test respectively.

Empirical Model:

The data were analyzed by liner regression model. The measurement for variables are displayed in section 3.4, the empirical models were as follow:

i. Model to Describe the Effect of DE and Financial risk on Firm Values (H1)

PE ratio=a_1+β_1DE ratio+ β_2 FR +e_1---------------------------------- (1)

ii. Model to Describe the Effect of DE , and Financial risk on ROE (H2)

ROE=a_{1+} β_3DE ratio+ β_4 FR+e_2-------------------------------------- (2)

Variables and Measurement:

  i. Dependent Variables: Firm Value=PE ratio, Return to owner=ROE.
  ii. Independent Variable: DE ratio, FR (Financial risk) = (PBIT/PBT), PBIT denotes the Profit before interest and tax, PBT=Profit before Tax.

RESULTS:
Descriptive Statistics:

Table 1A: Pearson and Kendall's Tau_B correlation matrix

Correlations		DERATIO	FR	ROE	PERATIO
DE_RATIO	Pearson Correlation	1	.112[**]	-.116[**]	-.053[*]
FR	Pearson Correlation	.112[**]	1	-.119[**]	.029
ROE	Pearson Correlation	-.116[**]	-.119[**]	1	-.050
PE_RATIO	Pearson Correlation	-.053[*]	.029	-.050	1
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Correlations			DERATIO	FR	ROE	PERATIO
Kendall's tau_b	DE_RATIO	Correlation Coefficient	1.000	.657[**]	-.188[**]	-.206[**]
	FR	Correlation Coefficient	.657[**]	1.000	-.371[**]	-.140[**]
	ROE	Correlation Coefficient	-.188[**]	-.371[**]	1.000	.085[**]
	PE_RATIO	Correlation Coefficient	-.206[**]	-.140[**]	.085[**]	1.000

. Determinant = 0.863

From the above table-1A we find that there have some correlations between the dependent variables and independent variables. Though the correlation between the two independent variable present but that are less than 70%(rule of thumb in case of secondary data) which means no multi-co-linearity problem present among the variables. This can be also justified from the Value of determinant which is tends to 1 in my case. So there has no multi-co-linearity problem among the variables**.**

Table 1B: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.680
Bartlett's Test of Sphericity	Approx. Chi-Square	100.489
	df	1
	Sig.	.000

The KMO Bartlett's Test (Table-1B) shows that sample is adequate as its value is garter than 0.60 and this test is also significant at 5% level. So my sample is adequate**.**

Table 2: The statistics of dependent and independent variables

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
DE_RATIO	1369	1.00	13.23	1.9900	1.78354	3.251	.066	11.439	.132
ROE	1369	.72	207.38	39.5171	21.15147	2.849	.066	12.861	.132
PE_RATIO	1369	1.00	4003.22	31.0424	124.46041	25.648	.066	777.926	.132
FR	1369	.016	116.667	1.76023	4.593998	18.972	.066	406.266	.132
Valid N (listwise)	1369								

The descriptive statistics shows that standard deviation of PE ratio is too much high and also value of Skewness/Kurtosis value where as standard deviation, Skewness and Kurtosis value are low for DE_RATIO. Mean value of ROE is higher than other variable but its Skewness is low.
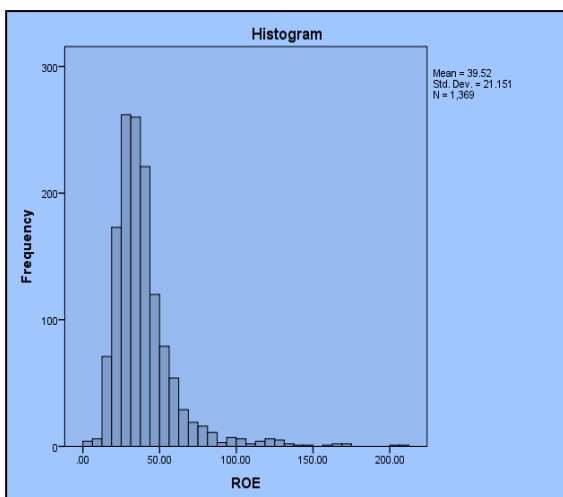
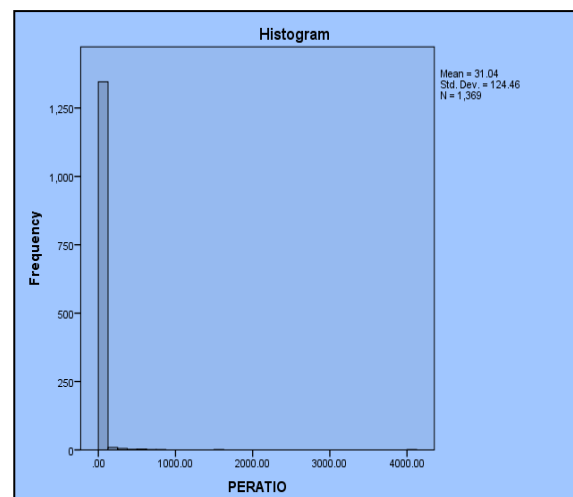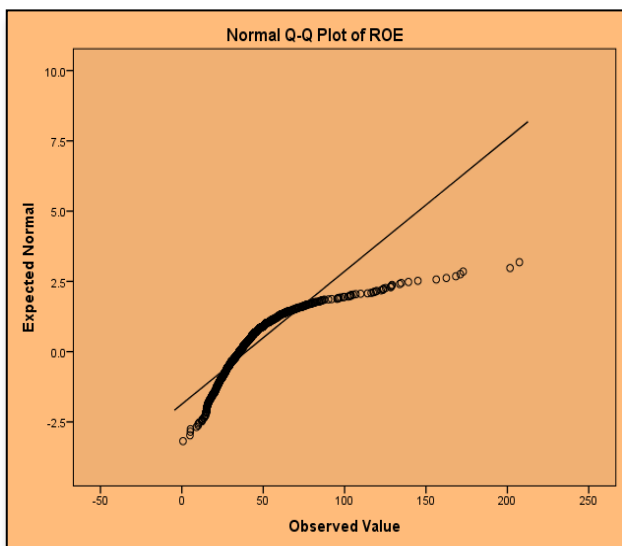**Figure-1(ROE)**

Figure-2(PERATIO)

Figure-3(ROE)

Figure-4(PERATIO)
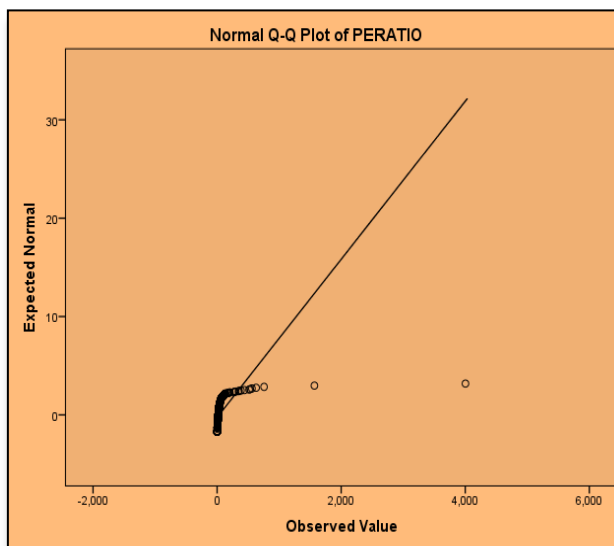
Figure-5 (FR)
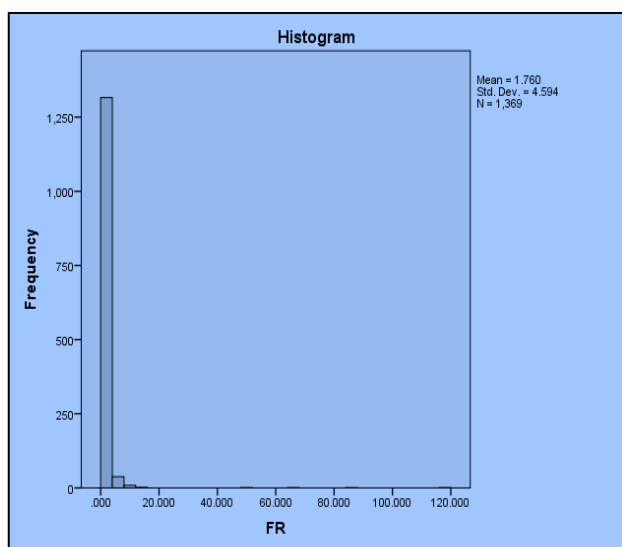
Figure-6(DERATIO)
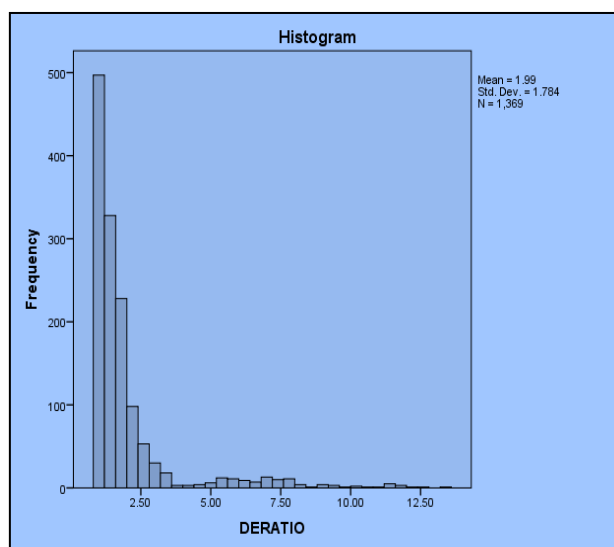
Figure-7(FR)
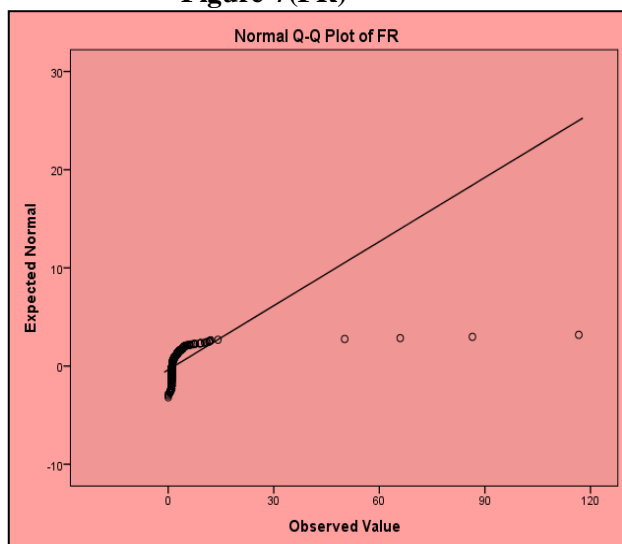
Figure-8 (DERATIO)
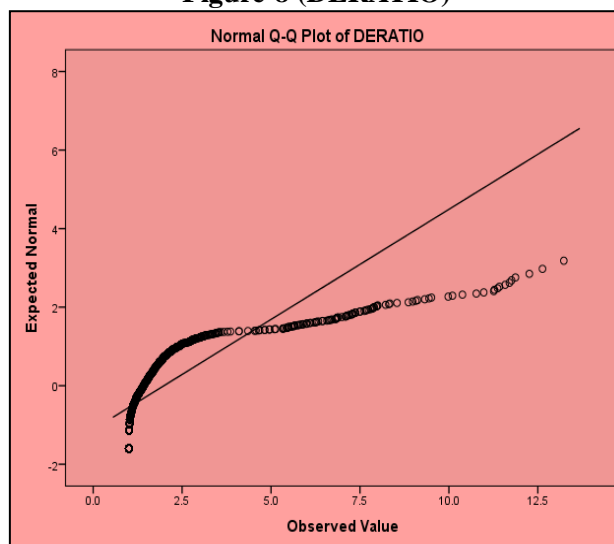
Table 3: Tests of Normality

	Tests of Normality					
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
ROE	.154	1369	.000	.768	1369	.000
PE_RATIO	.405	1369	.000	.107	1369	.005
FR	.423	1369	.005	.109	1369	.003
DE_RATIO	.289	1369	.001	.555	1369	.009

In Table-3 the test result shows that though it don't exist autocorrelation or multi-co-linearity problem among the variable but a significant homoskedasticity present among the variable.

Above histograms shows pattern of normality where I found that data set are not normally distributed (all are positively skewed) and that are also confirm in Table-3 where Kolmogorov-Smirnov[a] and Shapiro-Wilk test sig. value is less than .05.Which means homoskedasticity present in the data set.

If the data sets are not normally distributed regression equation and test result cannot able to generate good result. So normalisation is required. To normalise data set we transform them in logline form with the help of Log. After normalising Descriptive statistics values of variable are as under.

Table 4: Descriptive Statistics after normalising data set

	Descriptive Statistics After normalising data set							
	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
LOG_DE	.21368	.60744	.4950454	.09658821	-1.184	.066	1.197	.132
LOG_FR	.08337	.70475	.4944111	.03170830	-1.234	.066	24.799	.132
LOG_PE_RATIO	.000	3.602	1.19970	.492591	-.701	.066	1.888	.132
LOG_ROE	-.14	2.32	1.5509	.19647	-.167	.066	5.222	.132

Table 5: Tests of Normality Of Dependent and independent variable

	Tests of Normality Of Dependent and independent variable					
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LOG_ROE	.057	1369	.670	.959	1369	.640
LOG_PE_RATIO	.125	1369	.590	.898	1369	.560
LOG_DE	.148	1369	.520	.867	1369	.513
LOG_FR	.281	1369	.510	.626	1369	.509

Above table-4 shows that skewness and kurtosis value of the variable decreases which means log value of data set become normally distributed than before and from the tests of normality in Table-5 we confirm the same as Kolmogorov-Smirnov[a] and Shapiro-Wilk test of sig. value is garter than .05.

b. (i) The Effect of Debt equity ratio and Financial Risk on Firm Values(PE) :(H1)

Regression Model results 1:

Table 5: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.188^a	.036	.034	.484115	1.781

a. Predictors: (Constant), LOG_FR, LOG_DE_RATIO
b. Dependent Variable: LOG_PE_RATIO

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	11.794	2	5.897	25.161	.000^b
Residual	320.145	1366	.234		
Total	**331.939**	**1368**			

Table 6: Coefficients^a

Coefficients^a						
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1 (Constant)	1.670	.205		8.149	.000	
LOG_DE_RATIO	-.962	.141	-.189	-6.845	.000	
LOG_FR	.012	.428	.001	.028	.977	

Coefficients^a			
Model		Collinearity Statistics	
		Tolerance	VIF
1	LOG_DE_RATIO	.929	1.076
	LOG_FR	.929	1.076

The Durbin-Watson statistic is 1.781 which is between 1.5 and 2.5 therefore the data is not auto-correlated. The value of adjusted R^2 is 0.034 which means 3.4% variability of PE can be explain by DE ratio and Financial Risk of business.

The F test is significant, thus we can assume that the model can explains a significant amount of the variance in PE. Tolerance should be >0.1(or VIF<10) for all variable then no multicollinearity in multiple linear regression model. The standardise beta value of DE ratio is significant as P value is less than 0.05 and insignificant in case of FR as its P value is greater than 0.05.

b.(ii) The Effect of Debt equity ratio and Financial Risk on Firm performances (ROE): (H2)

Regression Model results 2:

Table 7: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.235^a	.055	.054	.19113	1.548

a. Predictors: (Constant), LOG_FR, LOG_DE
b. Dependent Variable: LOG_ROE

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.906	2	1.453	39.768	.000^b
Residual	49.902	1366	.037		
Total	**52.808**	**1368**			

Table 8: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.233	.081		27.603	.000
	LOG_DE_RATIO	-.188	.056	-.092	-3.386	.001
	LOG_FR	-1.192	.169	-.192	-7.051	.000

Model		95.0% Confidence Interval for B		Collinearity Statistics	
		Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.075	2.392		
	LOG_DE_RATIO	-.297	-.079	.929	1.076
	LOG_FR	-1.524	-.861	.929	1.076

The Durbin-Watson statistic is 1.781 which is between 1.5 and 2.5 therefore the data are not auto-correlated. The value of adjusted R^2 is 0.054 which means 5.4% variability of ROE can be explain by DE ratio and FR of business.

The F test is significant, thus we can say that the model can explains a low part of the variance in ROE and it is significant at 5% level. We know Tolerance should be >0.1(or VIF<10) for all variable then no multi-co-linearity in multiple linear regression model.The standardise beta value of DE ratio and FR is significant as P value are less than 0.05. In Collinearity Statistics the value of Tolerance and VIF signify my result.
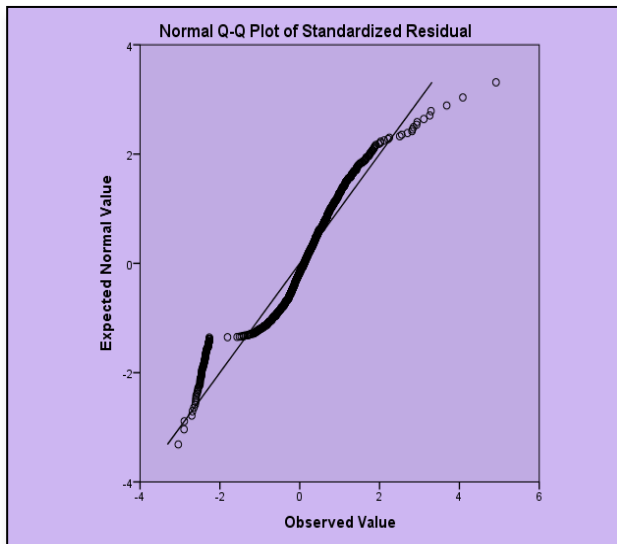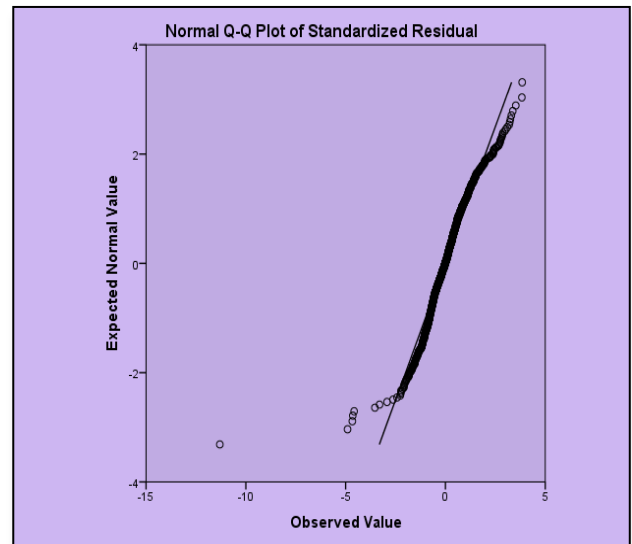
Figure-9: Q-Q Plot   **Figure-10: Q-Q Plot**

Figure-9 and10 are the Q-Q plot of regression residual when PE and ROE are dependent variable and DE Ratio and FR are independent variable. The Above two diagram of standardise residual of two regression equation follows more oriented to word the trend line. Which means there have no autocorrelation among the variable.

DISCUSSION AND CONCLUSION:

Major Findings and Implication: From the above discussion we can conclude that financial risk has no significant effect on the value of firm though it has a negative effect on the ROE of firm. Though the effect on ROE is small but that are significant at 5% level. Its means financial risk negatively affect equity return. On the other hand DEBT EQUITY ratio also has small negative effect on the value of firm and on the owner return (ROE) which are significant at 5% level. Therefore we can conclude that debt financing or financial risk nay not good to the equity owners of the firm. So before investing money in some companies' equity, special care should be taken on the debt equity ratio and financial risk of the firm.

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