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Research Article

IMPACT OF RATIOS ON FIRM PE AN EMPIRICAL STUDY ON BSE 100 COMPANY'S

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ABSTRACT

In this work an attempt has been made to ascertain which factors are the main determinant of the price earnings ratio of a firm and how different financial efficiency measuring ratios are related with PE ratio of BSE100 companies? This study is focused on BSE100 and all companies except financial institution and some debt less firm are taken into consideration. The reference period of the study is fifteen years and is completely based on secondary data which has been collected from S EQUITY data base. This study used factor analysis which is use to find out which factors are more important in the estimation PE ratio and then pooling regression model is use to test the explanatory power (influences) of different financial efficiency measuring ratio (Assets turnover ratio, Sales turnover ratio, liquidity ratio, Capital structure ratio, and Leverage on companies' PE. Method of Pool OLS is used to estimate the regression line. OLS is used because it minimizes the error between the estimated points on the line and the actual observed points of the estimated regression line by giving the best fit. All the dependent and independent variables are pooled cross section time series for estimation .Adjusted R² is carried on to test level of significant of regression line. The findings of the study have put forth that some independent variables have significant estimation power to estimate PE of a company where as other independent variables have no explanatory power to the variability of PE of a company.

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INTRODUCTION

In different times a number of research work were done where different factors had been taking into consideration to find out how return of a business organization is related with these factors. It is so because there was a tendency to evaluate a firm performance on the basis of return of a business organization. And so everyone likes to find out determinant of the return so that return can be easily estimated beforehand. But today complex business environment, only return is not the ultimate result to a prosperous investor. Rather than preservation and creation of the investor investment value is far more necessary over return. The basic reason behind it is that a firm can increase its rate of return by increasing its risk factor but that risk factors inversely affect its value of investment. So I like to find out how different factors are related with the value of a firm. For this purpose I have chosen PE as a proxy of firm value which is ultimate result of a firm and I want to know how different factors are related with it. In this context my lucid endeavor is to find out how different ratios are related with PE of a company. In a nut shell my primary objective is to find out how much this ratio can able to explain PE of a company

during my study period. In order to find out the impact of different financial ratios on PE of a firm, few research works have been undertaken so far by various researchers all over the world. The review of some of the major related studies have been undertaken for developing a clear understanding about the relationship among PE and different financial ratios. Hermuningsih *et.al.* (2013) in his study examined the influence of capital structure on firm value. He applied Structural Equation Model (SEM) on 150 listed companies on the Indonesia Stock Exchange during 2006 to 2010. The result shows that capital structure positively and significantly affects the company's value. Chadha and Shara (2016) made a study on manufacturing companies of India to find out the relationship between leverage and value of firm where he observe insignificant relationship between firm's value and leverage. Aggarwal *et.al.* (2007) 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 leverage among low-growth firm varies across national institution conditions. They pointed out that debt is value-decreasing among low growth us firm but value enhancing outside the US. McConnell (1995)

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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. Draniceanu *et.al.* (2005) in his work investigated the impact of capital structure on firm value for Romanian companies at the same time find out the determinants of leverage. The results show that capital structure has a positive impact of firm value, for both firms facing low growth opportunities and firms facing high growth opportunities A study undertook on 35 companies listed in Hong Kong Stock Exchange revealed that profitability and capital structure are interrelated (Chiang, 2002) . Altan *et.al.*(2011) in their study investigated the effect of financial structures of firms on their values. In the study 127 firms' data, that are indexed in ISE, are used. According to the results of the analysis the values of the firms were affected by financial structures of firms. From the above study author came up with the findings which were conflicting in nature as some studies confirm positive relationship between capital structure and value of firm, while other studies confirm negative relationship between the variables. In this background the present study has been undertaken to find out the relationship among the ratio and PE of the firms so as to facilitate the existing literature.

Objectives

The main objective of the study is to find out the explanatory power of different financial efficiency ratio about the PE of the company. The specific objectives are:

- To built up the regression equation of value of firm (PE) with this financial efficiency measuring ratios.
- To identify and analyze the relationship between PE with financial efficiency measuring ratio.
- To identify and analyze the relationship between PE with leverage.

Hypothesis

H0: Financial efficiency ratios have strong relationship with PE.

H1: There is no significant relationship between PE and the above financial ratios.

H0: Leverage have strong relationship with PE .

H1: There is no significant relationship between PE and leverage.

RESEARCH METHODOLOGY

The data-base of the study is completely based on secondary data which has been collected from various web sites and annual financial reports of the sample firms. The reference period of the study is of fifteen years which is from the financial year 2000-01 to 2015-16.

In this study all company except financial company and some IT company have been taken from BSE 100 . The reason of excluding financial company is that its capital structure is highly geared up by debt fund and some ratio which is necessary for my study, is not available due to their business nature. In order to achieve the set objectives of the study, I have employed Factor analysis, Regression Analysis and correlation analysis. Adjusted R² is carried on to test level of significant of regression line. As my study is on how different financial efficiency measuring ratio of different company related with PE so no unit root test is done on my data sate to find out auto- correlation problem over the study periods. For analyzing the impact of different financial ratio first of all descriptive analysis is carried out. Here PE is dependant variable and different financial ratios are independent variable. A hypothetical regression model with those variables is given below.

Model of the study

$PE = a + \beta_1 ROE + \beta_2 ROCE + \beta_3 DEBT EQUITY RATIO + \beta_4 Operating leverage(OL) + \beta_5 Financial leverage(CL) + \beta_6 Interest coverage ratio + \beta_7 Assets turnover ratio + \beta_8 Growth rate of operating profit(OPGR) + \beta_9 Growth rate of gross profit(GPGR) + e$.

Where a, is constant, β_i ($i=1$ to 10) are coefficient of variables, e is the residual term.

RESULTS AND DISCUSSIONS

Initially I have conducted one simple correlations analysis to find out my independent variables which may have impact on PE ratio of the firm. In Table1 author have calculated simple correlations coefficient. From the table it is clear that there have some relation of my independent variable with PE ratio of the firm and some of these correlation are significant at the 0.01level (2-tailed) and some have significant at the 0.05 level (2-tailed).

From Table 1A it is clear that these variables have an impact on PE of a firm but now we have to test how this variable is related with PE of the firm and how much they can explain the variability of PE of a firm during my study period. Before conducting my regression analysis I have calculated correlation matrix of my independent variable to find out whether there have any multi-co-linearity problem among this independent variable's. As my regression analysis is pooling regression analysis so no other test was conducted.

From the correlation matrix Table 1B it is clear that there has multi-co-linearity problem among the independent variable. We know in case of secondary data sate a high (0.7 or above) correlation between two variable imply multi-co-linearity problem between the two variable.

Table 1 A Simple correlations

Correlations Matrix											
	Debt/equity Ratio	ROE	ROCE	GPGR	OPGR	Interest Coverageratio	OL	FL	CL	Asset Turnoverratio	PE
PE	Correlation Coefficient	-.285**	.107**	.163**	.0137*	.0147*	.265**	-.048*	-.043	-.056*	.213**
	Sig. (2-tailed)	.000	.000	.000	.042	.047	.000	.046	.051	.049	.000
	N	1206	1206	1206	1206	1206	1206	1206	1206	1206	1206

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table1 B

Correlations											
Spearman's rho Correlation Coefficient	DEBT/EQUITY	DEBT/EQUITY RATIO	ROE	ROCE	GPR	OPGR	INTEREST COVERAGE RATIO	OL	F ²	Q ²	ASSETTURN OVERRATIO
	1	-0.322	-0.549	0.021	0.044	-0.731	-0.005	0.238	0.084	-0.278	
	ROE	-0.322	1	0.924	0.382	0.362	0.589	-0.107	-0.175	-0.162	0.504
	ROCE	-0.549	0.924	1	0.304	0.292	0.714	-0.084	-0.225	-0.163	0.601
	GPR	0.021	0.382	0.304	1	0.889	0.125	0.149	0.103	0.172	0.102
	OPGR	0.044	0.362	0.292	0.889	1	0.09	0.191	-0.04	0.136	0.086
	INTERESTCC	-0.731	0.589	0.714	0.125	0.09	1	-0.038	-0.233	-0.131	0.415
	OL	-0.005	-0.107	-0.084	0.149	0.191	-0.038	1	0.068	0.875	0.036
	FL	0.238	-0.175	-0.225	0.103	-0.04	-0.233	0.068	1	0.425	-0.078
	CL	0.084	-0.162	-0.163	0.172	0.136	-0.131	0.875	0.425	1	0.002
	ASSETTURN	-0.278	0.504	0.601	0.102	0.086	0.415	0.036	-0.078	0.002	1

Value of Determinant = .61

Moreover we know if the value of determinant of correlation matrix is tense to zero there have high multi-co-linearity problem among the independent variable. Now to solve this problem the techniques of principal component analysis is use for grouping this variable in some homogeneous group. As the value of determinant is greater than 0.60 so factor analysis is possible.

Before conducting PCA we have calculated KMO VALUE to test whether the sample size is adequate or not (Table-2). Table 2 show that KMO VALUE is 0.5970 which implies sample size is average but not so good.

Table 2 shows KMO and Bartlett's Test

KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			0.597
Bartlett's Test of Sphericity	Approx. Chi-Square	3597.953	
	df	28	
	Sig.	.000	

After conducting sample adequacy test PCA technique applied to solve multi-co-linearity problem among the independent variables. Multi-co-linearity is a linear association between two or more explanatory or predictor variables. Presence of Multi-co-linearity increases the stander errors of the coefficients. Increased standard errors may make some predictor variables statistically insignificant. Here among 10 variables 8 variables are interrelated with each other so factor analysis is applied for grouping this variable into some homogeneous group.

Table 4A & 4B showing Rotated Component Matrix and Component Transformation Matrix**Table 4 A**

Rotated Component Matrix			
VARIABLES	Component 1	Component 2	Component 3
ROCE	0.966		
ROE	0.944		
DEBT EQUITY RATIO	-0.379		
INTEREST COVERAGE RATIO	0.173		
GPR		0.926	
OPGR		0.923	
CL			0.858
OL			0.858

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table 4A and 4B showed the component matrix of the independent variable. Here eight variables grouped into three components to minimize Multi-co-linearity problem among the eight variables.

Table 4B

Component Transformation Matrix			
Component	1	2	3
1	0.958	-0.04	-0.28
2	0.107	0.967	0.231
3	0.265	-0.25	0.931

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table 4 C showing Component Score Covariance Matrix

Component Score Covariance Matrix			
Component	1	2	3
1	1	0	0
2	0	1	0
3	0	0	1

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Component Scores. Determinant = 1

Table 4C shows that the value of determinant is 1 which implies no Multi-co-linearity problem have in the driven independent variable (component1, component2, component3).

Now after minimizing multi-co-linearity problem I regresses liner regression by taking 5 variables' together (component1, 2, 3 and assets turnover ratio, financial leverage).Table 5 shows the model summary.

Table 5 Regression Model Summary

Mode	R	R Square	Adjusted R Square	Std.Error Of the Estimate
1	.133	.018	.014	155.1547

The strength of association is measured by the square of multiple correlation coefficient R^2 , which is also called coefficient of multiple determination. The value of $R^2 = 0.018$ indicating a variance of 1.8% is explained by the above regression model. The F-statistic has been conducted. The value of $F=4.333$, which is significant at 5% level.

Table 6 Analysis of variance (ANOVA)

Table 6 ANOVA					
Model	Sum of Squares	df	Mean square	F	Sig.
Regression	521555.403	5	104311.081		
Residual	28887592.14	1200	24072.993	4.333	.001
Total	29409147.55	1205			

Dependent Variable:PE
Predictors: (constant),assets turnover ratio,REGR FACTOR SCORE 2FOR ANALYSIS2, REGR FACTOR SCORE 3FOR ANALYSIS2, REGR FACTOR SCORE 1FOR ANALYSIS2

Table 7 Regression Coefficients

Model	Table 7 Coefficients			t	Sig.
	Unstandardized coefficients		Standardized coefficients		
	B	Std. Error	Beta		
(Constant)	32.799	7.630	----	4.299	.000
Regr Factor Score 1 FOR Analysis 2	-9.405	5.875	-.060	-1.601	.110
Regr Factor Score 2 For Analysis 2	18.884	4.474	.121	4.221	.000
Regr Factor Score 3 For Analysis 2	1.064	4.475	.007	.238	.812
FL	-.029	.328	-.003	-.089	.929
Asset Turnover Ratio	.646	3.507	.007	.184	.854

Dependent variable :PE

The result of multiple regression analysis is shown in table 7. The partial regression coefficient (B) for REGR FACTOR SCORE 1, 2, 3 (component 1, 2, 3) are -9.405, 18.884, 1.064 respectively and corresponding beta coefficient are -0.060, 0.121 and 0.007. The partial regression coefficient (B) for financial leverage and asset turnover ratio are -0.029 and .646, and corresponding beta coefficient are -0.003 and 0.007. Among all regression coefficient(B) only REGR factor score 2 for analysis 2 is significant. So the estimated regression equation is

$$PE=32.799 - 9.405(\text{regressiofactor1}) + 18.884(\text{regressionfactor2}) + 1.064(\text{regressionfactor3}) - 0.029(\text{financial leverage}) + 0.646(\text{assets turnover ratio}) +$$

The results also indicate that out of the 10 variables under study, Factor 2,Factor 3 and assets turnover ratio are positively associated (beta 0.121,0.007 and 0.007) with PE of firms ,where as the Factor 1 and FL are negatively associated (beta -0.060 and -0.003) with the dependent variable.

CONCLUSION

The present study measures the impact of various ratios on the PE of the firms. The study revealed that there exist positive association among PE and operating leverage, combined leverage, assets turnover ratio, growth rate of gross profit/operating profit of the firm. But among them only growth rate of operating profit and gross profit have significant positive association with PE of the firm. Whereas positive association among PE and operating leverage, combined leverage and assets turnover ratio are not significant at any level. The study also revealed that the negative association among PE and financial leverage, ROE and ROCE are not significant at any level. This leads us to the fact that leverage has no significant impact on the values (PE) of the firms and also assets turnover ratio, ROE and ROCE also have no significant impact on the PE of the firms rather growth rate of operating profit or gross profit have to some extend impact on

the PE of a firm. The findings of the study has investors implication, suggesting that their investment could be valuable if they invest money in such firms whose growth rate of gross profit or operating profit are good. This study will not only help the investors to increases their value of investment, but also help to take decision in selecting the right investment.

Limitation of my study

For this study purposefully some ratios and growth rate have been taken base on our judgment. No logical explanation has been given why they are selected. Our study is limited for 2000-2001 to 2015-16. I keep financial company out of my preview of study. Due to data heterogeneity and abnormality some company and some years are rejected primarily. As my study is on BSE100 Company only and the sample is not so good so the result may be different to some extend if excellent sample is taken.

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