

“Leverage” – An Analysis and Its Impact On Profitability With Reference To Selected Oil And Gas Companies

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ABSTRACT: *The purpose of this research is to study and understand the effect of leverage on the profitability of the oil and gas sector. It shows the relationship between leverage (Financial, operating and combined) and Earning per Share (EPS) of this sector. It analyses how earning capacity of this sector is affected by operating costs and fixed financial charges. It also shows the relationship between the Debt equity ratio and Earning per Share (EPS) and how this sector does debt financing efficiently. In this paper, oil and gas companies are selected for analysis and hypotheses are examined with the balanced panel using descriptive statistics, correlation and estimate equation.*

KEYWORDS: *Degree of financial leverage, Degree of operating leverage, Earnings per share, Return on assets, Return on equity, Return on investment*

I. INTRODUCTION

Liquidity management is essential for every organization. Simply we can say it as the payment of current obligations on business. The payment obligations include operating expenses that are short term but maturing long term debt. Liquidity ratios such as ratio, quick ratio and Acid test ratio are used for liquidity management in the organization that greatly affect on profitability of organization. So business has many liquid assets (Cash, Bank) that are used to meet the payment schedule by comparing the cash with the payment obligations. Liquidity ratios include cash and near-cash assets (together called "current" assets) of a business on one side and the immediate payment obligations (current liabilities) on the other side. The current assets mainly include receivables from customers and inventories of finished goods and raw materials. The payment obligations include liabilities to suppliers, operating and financial expenses that are to be paid shortly and maturing installments under long-term debt. Liquidity ratios are used to measure the ability of the business in order to meet the payment obligations by comparing the cash and near-cash with the payment obligations. If the reporting is insufficient, it indicates that the business might face difficulties in meeting its immediate financial obligations. This can affect the company's business operations and profitability. The Liquidity versus Profitability Principle: There is a transaction between liquidity and profitability; gaining more of one normally means giving up some of the other.

II. NEED AND OBJECTIVES OF THE STUDY

An investor who wants to make investment activity has to assess a lot of information about past performance and the expected future performance of the companies, industries and the economy before taking the investment decision. The present study is concerned with the analysis of the impact of leverage and liquidity on profitability of selected oil and gas companies.

The objectives of this study are as follows:

- ❖ To understand and evaluate the leverage and liquidity effects of the selected oil and gas companies.
- ❖ To examine the impact of leverage and liquidity on profitability and Earning per Share.
- ❖ To review the relationship between the financing mix and earnings per share.

III. LITERATURE REVIEW

Archer and D'Ambrosio (1972) said that, "The more the amount of fixed costs to total costs the more the operating leverage of the firm..."[Archer, 421]. Schultz and Schultz (1972) said that, "as a fixed expense is compared with an amount which is a function of a fluctuating base (sales), profit-and-loss results will not accept an in proportion relationship to that base. These results in fact will be subject to enlargement, the degree of which depends on the relative size of fixed costs vis-a-vis the potential range of sales volume. This is commonly known as operating leverage." [Schultz, 86]

Weston and Brigham (1969) told the businessmen and women that, "The more the fixed costs, the smaller the variable costs give the greater percentage change in profits both upward and downward." [Weston, 86] Luoma and Spiller (2002) told about teaching financial leverage in the perspective of accounting education. Primarily arguing for specific coverage of financial leverage in introductory accounting textbooks, they essentially introduce the multi-case simplified financial statements approach common in finance textbooks to their planned audience of accounting educators. Luoma and Spiller acknowledge that such material is usually given in an entire chapter in top finance textbooks, but the problem is that the lack of knowledge in starting accounting textbooks does not communicate the importance of the issue to financial managers who may take only the usual initial level to make sequence in accounting. Their treatment of the issue is of attention toward finance professors mostly because of its addition of relevant common accounting terminology (for example, "leverage benefit to shareholders"). The Bank of Jamaica (2005) stated that liquid assets should have the following attributes: Diversified, Residual maturities suitable for the institution's particular cash flow needs, readily changeable or convertible into cash and Minimal credit risk. Titman and Wessels (1988) said that highly profitable firms have lower levels of leverage than less profitable firms because they first use their earnings before looking for external capital. Burney, Boyles, and Marcis (2001) explained the use of the common relative financial statement approach when the model statements are developed ad hoc during an unstructured explanation of financial leverage which may arise before capital structure is formally addressed in the course. The authors point out those unintentional counterproductive results which may occur when such an ad hoc example is not properly structured with respect to interest rates and returns on equity. In their paper, reference is also made to the indifference point for capital structure changes as being defined in respect of Basic Earning Power (BEP) ratio, which is the same as Liang and Singh's operating ROI.

Morris and Shin (2010) theoretically defines the liquidity ratio as "realizable cash on the balance sheet to short term liabilities." In this definition of Liquidity ratio, "realizable cash" is defined as liquid assets plus other assets to which a haircut has been applied. George H. Pink, G. Mark Holmes (2005) said that ratio analysis is one of the predictable ways that uses financial statements to assess the company and create standards that have simply interpreted financial sense. Liang and Singh (2001) stated that the usual basic financial statement approach that is used in textbooks does not focus on the key issues and create misunderstanding for the student by introducing further details that should also be explained for the understanding of the students. They suggest a break-even point implied by the typical EBIT-EPS analysis used in many textbooks. The break-even point suggested by Liang and Singh explained a straightforward cost of funds point of view that students can easily understand. Although Liang and Singh explained their indifference point with respect of operating ROI but they show that the decisions suggested by their standard are the same to those that they found by using examples which rely on break-even EPS analysis and the related assumptions regarding numbers of shares outstanding. Wald (1999) stated that profitability which is the most important determinant of firms' financial leverage negatively affects the debt to asset ratios in the heteroskedastic Tobit regression model. Varsha, Virani (2010) in her study on "Impact of leverage on Profitability of Pantaloon Retail India Ltd" had stated that finance decision was concerned with selection of correct mix of debt and equity in its capital structure.

Its conclusion was that the company should reframe its capital structure and capacity utilization for further capability in future. Chandrakumaramanglam and Govindasamy (2010) have examined the impact of leverage on the profitability of selected cement companies in India. It explained the relationship between debt equity ratio & earning per share and how effectively the firm uses debt financing. Its results of the study suggested that leverage, profitability and growth are positively related and leverage had impact on profitability of firm. Peswani, Shilpa (2011) in her study has analysed the impact of leverage on profitability of two best companies of FMCG sector i.e. Britannia Industries Ltd and Marico Industries. It was studied through analysis that Marico Industries Ltd was a high leveraged firm than Britannia Industries Ltd. A high leveraged firm was capable of providing high return on equity to its shareholders but the profitability of both the companies was similar. Jagdish and Raiyani (2011) in their study explained the impact of financial risk on capital structure decisions in selected 59 Indian Industries for a time horizon of 10 years i.e. 1997-2007. The statistical tools used for analysis were mean, standard deviation, coefficient of variation, compound growth rate and T-test and F-test etc. The results of the study showed that risk due to changing in ROE have significant effect in variation in the use of debt financing. Love (2003) and Beck et al. (2005) explained that the benefits of better financial market development should build up primarily to smaller firms in a country because they are the marginal borrowers. Hall and Weiss (1967), Fama and French (1995), or Li et al. (2012) discussed that the small firms are relatively less profitable than large firms.

Beck et al. (2008) in survey data explained that small firms are basically different than large firms in terms of financing options. Small firms claim that they receive relatively less bank financing and cannot compensate for this lack of financial credit with trade credit. Zhang and Li (2008) discussed that increase in leverage decreases the agency cost. The result of the study explained that increase in the leverage may reduce the agency cost. In this study they also stated that if the leverage is increased from the optimal level then those results in the opposite put effect on the agency cost of free cash flow. They discussed that sometimes increase in the debt causes bankruptcy cost. They said that the increase in the debt level reduces the agency cost but increases the bankruptcy cost.

IV. SCOPE

4.1 Financial Leverage

Financial Leverage is caused due to fixed financial interest in every organization. Businesses use fixed financial charges to increase the effects of changes in earnings before interest and tax on the earning per share and profits. It includes the use of those funds that are obtained at a fixed cost in the expectation of increasing the return to the shareholders in future. The financial leverage used by every company is anticipated to earn more return on the fixed-charge funds than their costs. The surplus (or deficit) will increase (or decrease) the return on the owner's equity and return on investments

4.2 Combined Leverage

Operating and financial leverages together cause wide variation in EPS for a given change in sales and operating costs. It can be calculated by multiplying the operating leverage and financial leverage. The operating leverage affects the EBIT and the financial leverage affects the EPS, ROE and ROI. The management needs to manage the true combination of the operating and financial leverage. A company whose sales vary widely and occasionally should avoid use of high leverage because it will be exposed to a very high degree of risk.

4.3 Leverage and Earning Per Share

There is a close relationship between the financial leverage and Earning per Share of the company. If amount of financial leverage is high and the return on investment is greater than the cost of debt capital, then the impact of leverage on EPS will be favorable. The impact of financial leverage is unfavorable when the earning capacity of the firm is less than what is expected by the lenders (i.e.) the cost of debt.

4.4 Leverage and Return on investments

The return on investment comes from leverage appreciation of the assets value which is normally based on income. It means assets are purchased with only a portion of the purchase price coming from the buyer and the balance coming from the lender. Any increases in the value of the entire assets represent a real return on the original amount invested and the investor will make profits in the long run.

V. SELECTION OF VARIABLES

The 6 variables are considered in the study to analyze the effect of leverage on the profitability. The four variables are used as dependent variables and two variables are used as dependent.

5.1 Dependent variables

- 1-Return on assets (ROA) = Net profit before tax/ Total assets
- 2-Return on equity (ROE) = Net profit before tax/ shareholder's equity
- 3- Return on Investments (ROI) = Net profit before tax/ Investments
- 4- Earning per share (EPS) = Net Earnings / Number of Shares

5.2 Independent variables

- 1-Financial Leverage Ratio = Percent change in EPS / Percent change in EBIT
- 2-Operating Leverage Ratio = Percent change in EBIT / Percent change in sales.

5.3 Combined Leverage

Combined leverage shows the entire effect of the operating and financial leverages. In other words, it shows the total risks associated with the firm. It is the result of both the leverages.

Degree of Combined Leverage (DCL) = DOL * DFL

VI. METHODOLOGY

Models:

Model 1

$$ROA = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Model 2

$$ROE = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Model 3

$$ROI = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Model 4

$$EPS = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Where:

ROA= Return on asset,

ROE= Return on equity

ROI= Return on investment

DFL =Degree of financial leverage

DOL=Degree of operating leverage

ε = the error term

α : the constant, β : the regression coefficient

Leverage ratios are the financial statement ratios which show the degree to which the business is leveraging itself through its use of borrowed money.

The financial leverage ratio indicates the extent to which the business relies on debt financing.

A high financial leverage ratio indicates possible difficulty in paying interest and principal while obtaining more funding.

VII. SAMPLE DESIGN

7.1 Sampling Techniques

This study is related to Oil and Gas companies. The reason of selecting these companies is that the data or financial statements are easily available for them. Convenient Sampling techniques are adopted for the study.

7.2 Sample size

The selected sample is based on 25 Oil and Gas companies.

7.3 Data Collection Method

Financial statements are collected from various websites and other company websites.

7.4 Data Analysis Method

The data is analyzed by calculating Descriptive Statistics, Correlation Coefficients and Regression. The software used to analysis of research study is EViews 7.

7.5 Time Period of the Study

Six years data from the period 2007 to 2012 is used for the purpose of analysis.

7.6 Limitations of the Study

- This research is based on secondary data and only the period of 6 years is taken for analysis.
- Some of the external factors that cause the affect on the leverage were not taken into account.

VIII. EMPIRICAL RESULTS

Explanation:

The descriptive table 1 explains the central values of the data. It is used to check the effect of leverage on profitability. The table shows the mean and standard deviation value for variables. Mean represents the

average value; standard deviation shows deviation of value from mean. The return on assets (ROA) standard deviation is 196 percent. The return on equity (ROE) average is -3.1 percent for the selected time period of 2007-2012 and standard deviation is 69 percent. The ratio of return on investment (ROI) mean is -32395 percent and standard deviation is 6690313.3 percent. The earnings per share (EPS) and degree of financial leverage (DFL) average are approximately 2273 and 827 percent, respectively. The ratio of degree of operating leverage (DOL) shows average 1405 percent. The no of observations of the data is 150.

HYPOTHESIS TESTING# 01

H₁: There is significant relationship between DFL, DOL and ROA.

$$ROA = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Regression Analysis:

Explanation:

The table 2 explains the regression analysis of model 1. This table explains the dependency relationship between ROA (Return on Asset), DFL (Degree of Financial Leverage) and DOL (Degree of Operating Leverage) by using Least Square. C is a constant that explain ROA coefficient is -0.038562. DFL intercept is 0.000409 which explains that DFL has positive impact on ROA. DOL intercept is -0.000273; this explains that DOL has negative impact on ROA. These have inverse relationship. Hence A unit increase in DFL increases the ROA by 0.000409 units while a unit increase in DOL decreases the ROA by 0.000273 units. It can be observed from the table that the estimated value of the R-squared is approximately 0.001561. It shows that 0% of the variations in dependent variable (ROA) are explained by the given two independent variables. The value of F-statistic (0.114909) shows the validity of the model. Its value is 0.114909 which is below its probability (F-statistic) value of 0.891527. The t-statistic measures how many standard errors the coefficient is away from zero, therefore higher the t-value, the greater the confidence we have in the coefficients as predictors. By and large all the series in Oil and Gas companies have very lower t-values indicating lower reliability of the predictive power of the coefficients. The significance level is 0.891527, which is greater than the value of α which is 0.05 so the null hypothesis is accepted. Hence, it is concluded that the DFL does not differ significantly so it means there is no significant effect on ROA.

HYPOTHESIS TESTING# 02

H₁: There is correlation between DFL, DOL and ROA.

Explanation:

Table 3 explains that the correlation between ROA and DFL is 0.017153. It shows positive correlation which means increase in DFL, increases the ROA.

Correlation between ROA and DOL is -0.035511. It shows negative correlation i-e; increase in DOL, decreases the ROA.

The correlation between DFL and DOL is 0.004664 which shows a positive correlation. An increase in DFL increases the DOL and decrease in DFL decreases the DOL.

HYPOTHESIS TESTING# 03

H₁: There is significant relationship between DFL, DOL and ROE.

$$ROE = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Regression:

Explanation:

The table 4 explains the regression analysis of model 2. This table explains the dependency relationship between ROE (Return on Equity), DFL (Degree of Financial Leverage) and DOL (Degree of Operating Leverage) by using Least Square. C is a constant that explain ROE coefficient is 0.304532. DFL intercept is 5.79E-05 which explains that DFL has positive impact on ROE. DOL intercept is 0.000113; this explains that DOL has also positive impact on ROE. Hence A unit increase in DFL increases the ROE by 5.79E-05 units. Similarly a unit increase in DOL increases the ROE by 0.000113 units. It can be observed from the table that the estimated value of the R-squared is approximately 0.001789. It shows that 0% of the variations in dependent variable (ROE) are explained by the given two independent variables. The value of F-statistic (0.131746) shows the validity of the model. Its value is 0.131746 which is below its probability (F-statistic) value of 0.876667.

The t-statistic measures how many standard errors the coefficient is away from zero, therefore higher the t-value, the greater the confidence we have in the coefficients as predictors. By and large all the series in Oil and Gas companies have very lower t-values indicating lower reliability of the predictive power of the coefficients.

The significance level is 0.876667, which is greater than the value of α which is 0.05 so the null hypothesis is accepted. Hence, it is concluded that the DFL does not differ significantly so it means there is no significant effect on ROE.

HYPOTHESIS TESTING# 04

H_1 : There is correlation between DFL, DOL and ROE.

Explanation:

Table 5 explains that the correlation between ROE and DFL is 0.007118. It shows positive correlation which means increase in DFL, increases the ROE.

Correlation between ROE and DOL is 0.041729 which also shows positive correlation i-e; increase in DOL increases the ROE.

HYPOTHESIS TESTING# 05

H_1 : There is significant relationship between DFL, DOL and ROI.

$$ROI = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Regression:

Explanation:

The table 6 explains the regression analysis of model 3. This table explains the dependency relationship between ROI (Return on Investment), DFL (Degree of Financial Leverage) and DOL (Degree of Operating Leverage) by using Least Square. C is a constant that explain ROI coefficient is -323.2566. DFL intercept is -0.102273 which explains that DFL has negative impact on ROI. DOL intercept is -0.010156; this explains that DOL has also negative impact on ROI. These have inverse relationship. Hence a unit increase in DFL decreases the ROI by 0.102273 units. Similarly a unit increase in DOL decreases the ROI by 0.010156 units. It can be observed from the table that the estimated value of the R-squared is approximately 0.000002. It shows that 0% of the variations in dependent variable (ROI) are explained by the given two independent variables. The value of F-statistic (0.000130) shows the validity of the model. Its value is 0.000130 which is below its probability (F-statistic) value of 0.999870. The t-statistic measures how many standard errors the coefficient is away from zero, therefore higher the t-value, the greater the confidence we have in the coefficients as predictors. By and large all the series in Oil and Gas companies have very lower t-values indicating lower reliability of the predictive power of the coefficients. The significance level is 0.999870, which is greater than the value of α which is 0.05 so the null hypothesis is accepted. Hence, it is concluded that the DFL does not differ significantly so it means there is no significant effect on ROI.

HYPOTHESIS TESTING# 06

H_1 : There is correlation between DFL, DOL and ROI.

Explanation:

Table 7 explains that the correlation between ROI and DFL is -0.001271. It shows negative correlation which means increase in DFL, decreases the ROI.

Correlation between ROI and DOL is -0.000394 which also shows negative correlation i-e; increase in DOL decreases the ROI.

HYPOTHESIS TESTING# 07

H_1 : There is significant relationship between DFL, DOL and EPS.

$$EPS = \alpha + \beta_1 DFL + \beta_2 DOL + \varepsilon$$

Regression:

Explanation:

The table 8 explains the regression analysis of model 4. This table explains the dependency relationship between EPS (Earning per Share), DFL (Degree of Financial Leverage) and DOL (Degree of Operating Leverage) by using Least Square. C is a constant that explain EPS coefficient is 21.71107. DFL intercept is 0.062473 which explains that DFL has positive impact on EPS. DOL intercept is -0.036123; this explains that DOL has negative impact on EPS. It has inverse relationship. Hence a unit increase in DFL increases the EPS by 0.062473 units. A unit increase in DOL decreases the EPS by -0.036123 units. It can be observed from the table that the estimated value of the R-squared is approximately 0.020240. It shows that 2% of the variations in dependent variable (EPS) are explained by the given two independent variables. The value of F-statistic (1.518388) shows the validity of the model. Its value is 1.518388 which is below its probability (F-statistic) value of 0.222480. The t-statistic measures how many standard errors the coefficient is away from zero, therefore higher the t-value, the greater the confidence we have in the coefficients as predictors. By and large all

the series in Oil and Gas companies have very lower t-values indicating lower reliability of the predictive power of the coefficients. The significance level is 0.222480, which is greater than the value of α which is 0.05 so the null hypothesis is accepted. Hence, it is concluded that the DFL does not differ significantly so it means there is no significant effect on EPS.

HYPOTHESIS TESTING# 08

H₁: There is correlation between DFL, DOL and EPS.

Explanation:

Table 9 explains that the correlation between EPS and DFL is 0.069275. It shows positive correlation which means increase in DFL, increases the EPS.

Correlation between EPS and DOL is -0.123938 which shows negative correlation i-e; increase in DOL decreases the EPS.

IX. CONCLUSION

This paper explained the studies on the leverage analysis and its impact on profitability with reference to Oil and Gas companies. Using the Panel data of companies between 2007 and 2012, we examined that whether there is effect of leverage on profitability or not. I used return on asset, return on equity, return on investment and Earning per share as dependent variables and degree of financial leverage and degree of operating leverage as independent variables. After applying regression, correlation descriptive analysis it is concluded that DFL and ROA have positive relationship while DOL and ROA have inverse relationship. It means that there is positive correlation between ROA and DFL while there is negative correlation between ROA and DOL. DFL, DOL and ROE have positive relationship. It means that there is positive correlation between these variables. DFL and ROI have inverse relationship and similarly DOL and ROI also have inverse relationship. It means that there is negative correlation between these variables. DFL and EPS have positive relationship while DOL and EPS have negative relationship. There is positive correlation between DFL and EPS while there is negative correlation between DOL and EPS. These results does not affect significantly. So there is no significant effect of DFL and DOL on ROA, ROE, ROI and EPS. It was supposed that highly leveraged oil and gas companies have lower profitability. However, this research is opposite to the supposition that there is positive relationship between financial leverage and both profit measures. It was also supposed that highly leveraged companies are riskier with reference to return on equity and investment. The results showed that high leveraged firms were less risky in both market-based and accounting-based measures and it is opposite to the hypothesis one. Industry specific variables may help in explaining these unexpected findings.

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TABLE 1: DESCRIPTIVE STATISTICS

	N	Mean	Standard Deviation
Return on Asset	150	-0.031335	1.961829
Return on Equity	150	0.303419	0.693928
Return on Investment	150	-323.9598	6690.313
Earnings per Share	150	22.73541	74.24003
Degree of Financial Leverage	150	8.270466	83.01153
Degree of Operating Leverage	150	-14.05376	255.3905

TABLE 2: DEPENDENT VARIABLE ROA

Variable	Coefficient	Standard Error	t-statistic
Coefficient	-0.038562	0.162194	-0.237752
Degree of Financial Leverage	0.000409	0.001948	0.210139
Degree of Operating Leverage	-0.000273	0.000633	-0.431858
R ²	0.001561		
F-statistic	0.114909		
Prob. (F-statistic)	0.891527		

TABLE 3: CORRELATION OF ROA, DFL AND DOL

	Return on Asset	Degree of Financial Leverage	Degree of Operating Leverage
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			Leverage	Leverage
Return on Asset		1.000000		
Degree of Financial Leverage		0.017153	1.000000	
Degree of Operating Leverage		-0.035511	0.004664	1.000000

TABLE 4: DEPENDENT VARIABLE ROE

Variable	Coefficient	Standard Error	t-statistic
C	0.304532	0.057364	5.308773
Degree of Financial Leverage	5.79E-05	0.000689	0.084023
Degree of Operating Leverage	0.000113	0.000224	0.505995
R ²	0.001789		
F-statistic	0.131746		
Prob. (F-statistic)	0.876667		

TABLE 5: CORRELATION OF ROE, DFL AND DOL

	Return on Equity	Degree of Financial Leverage	Degree of Operating Leverage
Return on Equity	1.000000		
Degree of Financial Leverage	0.007118	1.000000	
Degree of Operating Leverage	0.041729	0.004664	1.000000

TABLE 6: DEPENDENT VARIABLE ROI

Variable	Coefficient	Standard Error	t-statistic
C	-323.2566	553.5534	-0.583966
Degree of Financial Leverage	-0.102273	6.647429	-0.015385
Degree of Operating Leverage	-0.010156	2.160664	-0.004700
R ²	0.000002		
F-statistic	0.000130		
Prob. (F-statistic)	0.999870		

TABLE 7: CORRELATION OF ROI, DFL AND DOL

	Return on Equity	Degree of Financial Leverage	Degree of Operating Leverage
Return on Equity	1.000000		
Degree of Financial Leverage	-0.001271	1.000000	
Degree of Operating Leverage	-0.000394	0.004664	1.000000

TABLE 8: DEPENDENT VARIABLE EPS

Variable	Coefficient	Standard Error	t-statistic
Coefficient	21.71107	6.080111	3.570834
Degree of Financial Leverage	0.062473	0.073014	0.855633

Leverage Degree of Operating	-0.036123	0.023732	-1.522087
Leverage R ²	0.020240		
F-statistic	1.518388		
Prob. (F-statistic)	0.222480		

TABLE 9: CORRELATION OF EPS, DFL AND DOL

	Earnings per Share	Degree of Financial Leverage	Degree of Operating Leverage
Earnings per Share	1.000000		
Degree of Financial Leverage	0.069275	1.000000	
Degree of Operating Leverage	-0.123938	0.004664	1.000000
