BUSINESS AND FINANCIAL RISKS IN RELIANCE INDUSTRIES LIMITED: AN EMPIRICAL INVESTIGATION

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Abstract

Risk exists because lack of certainty in future. Risk attached to a firm can be categorised as business risk and financial risk. Present study attempts to analyse various company specific risk indicators in context of business and financial risks. These indicators namely; degree of operating leverage, fixed asset to total asset ratio, degree of financial leverage, debt equity ratio and degree of combined leverage have been analysed with various statistical tools such as descriptive statistics parameters like mean, median, standard deviation and skewness etc., correlation and regression. Total study period has been bifurcated into first half (2008-2012) and second half (2013-2017). These two separate periods then analyzed and compared with each other along with the entire period. A linear regression analysis has also been done to examine the extent of impact of DOL and DFL on DCL. Association between D/E ratio and FATA has also been examined. Various correlation measurement criteria namely; Pearson's correlation, Spearman's rank correlation and Kendall's correlation have been applied to examine the degree of association between risk and return of RIL. Findings reveal that during the study period, covering last ten years, RIL experienced rise in overall risk influenced more by operating risk. Pearson correlation matrix exhibits statistically insignificant association between debt equity and FATA. Further, study also observed negative association between risk undertaken and return generated by RIL. Such association contradicts established theoretical arguments toward positive association between risk and return.

Keywords: Business Risk, Financial Risk, Return, Total risk.

JEL Classification: G 30, G 32.

INTRODUCTION

Risk exists because lack of certainty in future. Risk attached to a firm can be categorised as business risk and financial risk (Tulsian, 2010).

Business risk of a company arises out of dispersion of the expected operating profitability of the company. A company's expected operating profitability broadly depends on several

factors. Economy specific factors are generally concerned with fluctuations in foreign exchange rates, inflation, imports, Govt. policies, fiscal deficit etc. However, degree impact of economy specific factors may depend upon whether the concerned industry is cyclical or non-cyclical in nature. Industry-specific factors are nature of industry, nature of competition, policy of govt. for concerned industry, availability of raw materials, technological changes and industrial relations. Company-specific factors are exclusively related with the company concerned such as cost structure, operating efficiency, liquidity, financial risk managerial efficiency etc. These factors broadly affect business as well as financial risk of a firm (*Gupta & Sur, 2013*).

Technically, business risk is associated with capital budgeting (Investment) decision of a firm (*Tulsian, 2010*). Business risk is single most important determinant of capital structure, and it represents the amount of risk that is inherent in the firms operation even if it uses no debt financing. Business risk depends in part on the extent to which a firm shapes fixed cost into its operations. Other things held constant, higher the firms fixed cost, higher the business risk (*Brigham & Houston, 2013*).

In context of company specific risk indicators, leverage analysis is one of the techniques to examine business and financial risk of a company. There are some specific indicators for business, financial and total risk in context of a company as discussed below:

Operating Leverage: Operating leverage is a measure of the combination of fixed costs and variable costs in a company's cost structure. This term relates directly to a company's contribution margin and breakeven point (*Wilkinson, 2013*). Further, for either a single-product or multi-product firm, the degree of operating leverage measures the full effect of a firm's operating leverage on its systematic risk. In addition, sales variability measure is also an important differentiating factor among the systematic risk of common stocks (*Gahlon, 1981*).

A company with high fixed costs and low variable costs has high operating leverage and vice-versa. The company must generate high sales volume to cover the high fixed costs. In other words, as sales increase, the company becomes more profitable. In a company with a cost structure that has low operating leverage, increasing sales volume will not dramatically improve profitability since variable costs increase proportionately

with sales volume. A product with proportionately less variable cost has a higher contribution margin which indicates high operating leverage i.e., higher fixed costs in relation to variable costs. A company with a high breakeven point has high operating leverage. Because more fixed costs translate into a higher breakeven point – more sales volume is required to cover the fixed costs (Wilkinson, 2013).

Degree of operating leverage (DOL) indicates firm's ability to use fixed operating costs to magnify the effect of changes in sales on its EBIT. The higher the DOL, greater will be the business risk. It is indicated as Contribution/EBIT (Singh & Kaur, 2015).

Fixed Asset to Total Asset Ratio (FATA): This formula is used to determine the proportion of fixed assets that are likely to be required as other asset levels change. It is most often used as a cross-check when developing budgets, in order to verify if budgeted capital expenditure levels are in line with historical experience (Putra, 2009). Higher the FATA higher will be the business risk because of larger part of total cost attributed to higher fixed operating cost.

Financial risk on the other hand is result of capital structure decision of a

company. Magnitude of financial risk depends upon proportion of capital having fixed capital charges in total capital. These charges do not vary with the earnings before interest and taxes (Khan & Jain, 2010). It is the risk of being unable to cover fixed financial burdens. It is a further increase in stockholders risk, over and above the firm's basic business risk, resulting from the use of financial leverage (Brigham & Houston, 2013).

Two most commonly used indicators of financial risk are (i) degree of financial leverage (DFL) and debt-equity ratio (DER).

Degree of Financial Leverage (DFL): DFL indicates change in EPS due to change in operating profit (Kapil, 2014). The higher the proportion of fixed charge bearing capital to total capital employed by a company, the higher is the value of DFL and the greater is the degree of financial risk associated with the company. It is expressed as EBIT/EBT.

Debt Equity Ratio (DER): Debt equity ratio indicates the relative claims of long-term creditors and owners against the assets of a company. The higher value of DER indicates higher leverage and vice-versa. It is known as a long term solvency ratio that indicates the relation

between the portion of assets financed by creditors and the portion of assets financed by stockholders. Debt to equity ratio expresses the relationship between external equity (liabilities) and internal equity (stockholder's equity). A ratio of 1 (or 1: 1) means that creditors and stockholders equally contribute to the assets of the business. A less than 1 ratio indicates that the portion of assets provided by stockholders is greater than the portion of assets provided by creditors and a greater than 1 ratio indicates that the portion of assets provided by creditors is greater than the portion of assets provided by stockholders (*accounting for management*). In general, lower the debt equity ratio, higher the degree of protection enjoyed by the creditors (*Chandra, 2016*).

Total risk indicates combined effect of business and financial risk. According to literatures, there should be proper balance between both the risks. Preferably both risks should not increase at the same time. In order to maintain balance in total risk, financial and operating risk should compensate each other at a given point of time.

Degree of Combined leverage (DCL): It is a ratio that summarizes the effect of both

operating and financial leverage. This ratio shows the percentage change in earnings per share (EPS) caused by a 1% change in sales. The higher its value, the more vulnerable a company is for a decrease in sales. The combined leverage summarizes the effect of fixed operating costs and fixed financial costs on a company's earnings per share (EPS). That ratio is a measure of the total risk of a business because it includes both operating risk and financial risk (*financial management pro*).

A high value DCL ratio means that a large proportion of a company's total costs are fixed, and incremental sales will result in a higher incremental EPS. Other things being equal, such companies have to generate more sales to cover their total fixed costs. A smaller proportion of fixed operating and financial costs will result in a lower value DCL ratio, which means lower incremental EPS on incremental sales and lower sensitivity to the slippage in sales. (*Financial management pro*). DCL is expressed as $DCL = DOL \times DFL = \left(\frac{\text{Contribution Margin}}{\text{EBIT}} \right) \times \left(\frac{\text{EBIT}}{\text{EBT}} \right) = \frac{\text{Contribution Margin}}{\text{EBT}}$.

The difference between the total risk and the business risk of a company can also be considered as a measure of the extent of financial risk (*Barges, 1963*). Under this approach, the total risk of a company

is measured by the 'coefficient of variation' of the net earnings available to equity shareholders or return on equity (ROE) and the business risk is measured by the 'coefficient of variation' of the operating profit or operating profit ratio. The wider the difference between these two coefficients, the greater is the degree of financial risk (Gupta and Sur, 2013).

RELIANCE INDUSTRIES LIMITED: A BRIEF PROFILE

Reliance Industries Ltd. is India's largest private-sector company, generating revenues of \$19.97 billion, or more than 3 percent of India's total gross domestic product. Founded as a textiles company, Reliance has successfully completed a backward integration strategy that has transformed it into India's largest private-sector petrochemicals company, and number two overall (behind state-owned India Oil). Reliance Industries represents the continuation of India's greatest corporate success story since the country's independence. Founded by Dhirubhai H. Ambani in 1958, Reliance grew to include holdings in energy production and distribution, telecommunications, and capital finance. After a public feud between Mukesh D. Ambani and younger brother Anil, these operations were split off into a new company controlled by Anil

Ambani (*reference for business*).

It is one of the companies to be listed in Fortune 500 at rank 215 as per the 2016 list. It is also among the top 250 Global Energy Company by Platts (2016), and is ranked highly at number 8. The company continues to go strong despite the split between the Ambani brothers in 2005-06 (*success story*).

Reliance continues to be India's largest exporter accounting for 8% of India's total merchandise exports with a value of Rs 147,755 crore and access to markets in 108 countries. Reliance is responsible for almost 5% of India's total revenues from customs and excise duty and is also the highest Income tax payer in the private sector in India (newsweek).

OBJECTIVES OF THE STUDY

An outline of objectives is mentioned as under:

- I. To analyze DOL, DFL, DCL, FATA and DER of Reliance Industries Limited.
- II. To examine association between DOL, DFL and DCL.
- III. To examine association between risk and return relationship of RIL.

RESEARCH DESIGN

Based upon following discussion, the approach adopted for this paper is analytical in nature.

Period of the Study: The study covers period of ten years (2008 to 2017).

Nature and Source of data: Data collected is secondary in nature. Data has been collected from consolidated balance sheet, ratios and P&L account of Reliance Industries Limited from money control.

Methodology: To serve the first objective of the study, the total study period has been bifurcated into first half (2008-2012) and second half (2013-2017). These two separate periods then analysed and compared with each other along with the entire period. Further, in context of first objective, slopes of DOL and DFL have been compared together. Same attempt has been undertaken for comparing slopes of FATA and D/E ratio. Second objective is served on the basis of correlation coefficient amongst DOL, DFL and DCL. Further, a linear regression analysis has also been done to examine the extent of impact of DOL and DFL on DCL. Association between D/E ratio and FATA has also been examined. Third objective has been justified on the basis of various correlation measurement criteria namely; Pearson's correlation,

Spearman's rank correlation and Kendall's correlation to examine the degree of association between risk and return of RIL.

Limitations: The scope of the study is limited to the extent of analysing company specific business and financial risks based upon specific ratios. It does not cover industry and economy related factors affecting the financial and business risk of the company under consideration. Further there might be some discrepancy while calculating variable cost and fixed cost to find out DOL and DFL on the basis of P&L account of RIL. This study concentrates on analysing business and financial risk only without considering underlying causes affecting such risks. Further, present study does not deal with any risk management strategy exercised by RIL.

FINDINGS

Table 1 to table 4 are in context of first objective of the study i.e. analysing DOL, DFL, DCL, FATA and DER of Reliance Industries Limited.

Analysis of Operating, Financial and Total Risk of RIL

Mean and medians are measures of central tendency. In case of symmetric distribution, mean and median of a series

will be same. In case asymmetric distribution, they are not supposed to be the same. In context of this study, all data series have almost equivalent mean and median values (TABLE 1) indicating the fact that data series used in this study are almost symmetrical.

As one of the descriptions of data set include skewness and kurtosis. Skewness is a measure of symmetry, or more precisely, the lack of symmetry. A distribution or data set is symmetric if it looks the same to the left and right of the centre point. Kurtosis is a measure of whether the data are heavy-tailed or light-tailed relative to a normal distribution. That is, data sets with high kurtosis tend to have heavy tails, or outliers. Data sets with low kurtosis tend to have light tails, or lack of outliers (*NIST e handbook*).

A symmetrical dataset will have skewness equal to 0. So, a normal distribution will have a skewness of 0. Skewness essentially measures the relative size of the two tails. The rule of thumb appears to be (McNeese, 2016):

- If the skewness is between -0.5 and 0.5, the data are fairly symmetrical.
- If the skewness is between -1 and -0.5 or between 0.5 and 1, the data are moderately skewed.

- If the skewness is less than -1 or greater than 1, the data are highly skewed.

In context of present study, all skewness values fall within the range of -0.5 and 0.5. Hence, may be considered fairly symmetrical (refer TABLE 1).

Distributions with kurtosis less than 3 are said to be *platykurtic*. It means the distribution produces fewer and less extreme outliers than does the normal distribution (*Wikipedia*). In above case all of the data series observed to have kurtosis less than 3 indicating the fact that they have fewer and less extreme outliers (TABLE 1).

Average DOL (TABLE 1) for the entire period was 2.10 whereas it was 1.90 in first half (2008-12) and 2.29 in second half (2013-17). Thus in first half, average operating leverage of RIL was at low level as compared to second half. DOL varied between 2.49 (2013-17) and 1.62 (2008-12). The linear trend equation fitted to the DOL series indicates upward trend which was observed to be statistically significant at 0.05 level of significance (TABLE 2). In case of FATA, average was 0.63, 0.63 and 0.62 for the entire period, first half and second half respectively (TABLE 1 & 2.) Thus

there was no major change in the proportion of long term investment of RIL during the period. FATA fluctuated between 0.73 and 0.50 during the study period. The linear trend equation fitted in case of FATA indicates statistically insignificant upward trend at 0.05 significance level (TABLE 2).

Fig.1 indicates rising trend in absolute DOL while percentage change indicates declining trend indicating that DOL is rising at declining rate. In case of FATA, fig. 2 exhibits that FATA is rising at increasing rate.

In case of DFL, the average value was 1.14 (TABLE 1) for the entire period (2008-17) whereas it was 1.12 for the first half (2008-12) and 1.16 for second half (2013-17). DFL was observed to be slightly higher in second half as compared to first half. DFL fluctuated within the range of 1.19 and 1.08 during the study period. Linear trend equation fitted against DFL exhibited upward trend that was found statistically insignificant 0.05 level (TABLE 2). In case of D/E ratio as another indicator of financial risk, average figure was observed to be 0.61 for the entire period, 0.57 in first half and 0.65 in second half (TABLE 1 & 2). D/E ratio found to be fluctuated in between 0.70 and 0.49.

Linear trend line of D/E ratio exhibited statistically insignificant upward trend at 0.05 level of significance (TABLE 2).

Fig. 3 indicates that DFL is rising at lower rate during the study period. D/E ratio is rising at constant rate over the year as indicated by fig. 4.

In case of DCL as indicator of total risk, mean for the entire period observed to be 2.39 (TABLE 1) whereas for the first five years it was 2.13 and later part of the period observed 2.65, higher than that of first half as well as entire period (TABLE 2). This may be due to higher DOL in second half as compared to first half and entire period. DCL, during the study period fluctuated within the range of 2.86 and 1.83. Linear trend fitted against DCL exhibits upward trend found to be statistically significant at 0.05 significance level (TABLE 2). Fig. 5 indicates that DCL is increasing at declining rate.

Another dimension is concerned with comparing *whether the slopes of DOL and DFL are statistically significant* i.e., whether both of them were moving at the same rate. To conduct the test following hypothesis was examined.

$$H_0: \beta_1 = \beta_2 \text{ i.e. } \beta_1 - \beta_2 = 0$$

There is no difference between slopes of DOL and DFL

$$H1: \beta_1 \neq \beta_2 \text{ i.e. } \beta_1 - \beta_2 \neq 0$$

There exists difference between slopes of DOL and DFL

Results depicted in TABLE 3 rejects null hypothesis thereby concluding that there is significant difference between slopes of DOL and DFL with p value less than 0.05. However, it is also evident from Fig. 6 indicating that both were not rising at same rate over the years.

Alternative indicators of business risk are financial risk are FATA and D/E ratio. Applying the same approach as above, attempt has been undertaken to *compare the slopes of FATA and D/E ratio*.

$$H_0: \beta_1 = \beta_2 \text{ i.e. } \beta_1 - \beta_2 = 0$$

There is no difference between slopes of FATA and D/E ratio

$$H1: \beta_1 \neq \beta_2 \text{ i.e. } \beta_1 - \beta_2 \neq 0$$

There exists difference between slopes of FATA and D/E ratio.

Result exhibited in TABLE 4 indicates that slopes of FATA and D/E ratio do not significantly differ from each other. Hence null hypothesis is accepted since p value is greater than 0.05 in this case. It is also evident from Fig.7.

Association between DOL, DFL AND DCL

Table 5 to table 10 are concerned with second objective of the study.

In order to check the association between DOL, DFL and DCL parsons' correlation (TABLE 5) was applied at first instance.

Theoretically, DFL and DOL should not rise at the same time and to same extent to maintain balance between business and financial risk. Relationship between DOL and DFL was not statistically significant (TABLE 5) in case of RIL.

Nature of association between DOL, DFL and DCL is such that they directly affect each other which can be exhibited as:

$$\frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{Contribution}}{\text{EBT}}$$

Thus, another dimension of examining the extent of association is based upon above relationship. DOL and DFL are determinants of DCL. Following the above relationship, an attempt has been made to examine relative impact of DOL and DFL on DCL. To serve the purpose, the hypothesis has been outlined as:

- I. H_0 = DOL do not influence DCL meaningfully.
- II. H_0 = DFL do not influence DCL significantly.

$$DCL = \beta_0 + \beta_1 (\text{DOL}) + \beta_2 (\text{DFL}) + e$$

β_0 = the intercept of the equation

β_1 & β_2 = coefficients of variables

e = Error term

Before examining the above mentioned equation, some preliminary tests namely; test of normality and collinearity has been conducted to avoid any dubious interpretation. Results exhibited in TABLE 6 indicate that all the concerned variables qualify normality test.

Tolerance as a measure of collinearity is indicated as $1-R^2$. A small tolerance value indicates that the variable under consideration is almost a perfect linear combination of the independent variables already in the equation and that it should not be added to the regression equation (*research consultation*). According to various recommendations for acceptable levels of tolerance published in literatures is perhaps a value of .10. It is recommended as the minimum level of tolerance (e.g., Tabachnick & Fidell, 2001). However, a recommended minimum value as high as .20 has also been suggested (Menard, 1995) and a value of .25 can be seen used in the literature (e.g., Huber & Stephens, 1993) (*how 2 stats*). In present study results observed in TABLE 7 indicates 0.701 tolerance level for both the independent variables i.e., DOL and DFL.

The Variance Inflation Factor (VIF) measures the impact of collinearity among the variables in a regression model. The Variance Inflation Factor (VIF) is $1/\text{Tolerance}$. It is always greater than or equal to 1. Values of VIF that exceed 10 are often regarded as indicator of multicollinearity, but in weaker models values above 2.5 may be a cause for concern (*research consultation*). Acceptable levels of VIF according to published literatures is a value of 10, recommended as the maximum level of VIF (e.g., Hair, Anderson, Tatham, & Black, 1995; Kennedy, 1992; Marquardt, 1970; Neter, Wasserman, & Kutner, 1989). The VIF recommendation of 10 corresponds to the tolerance recommendation of .10 (i.e., $1 / .10 = 10$). However, a recommended maximum VIF value of 5 (e.g., Rogerson, 2001) and even 4 (e.g., Pan & Jackson, 2008) can be found in the literature (*how 2 stats*). In context of this study VIF is 1.427 (TABLE 7), that is acceptable according to literature.

Collinearity is spotted by finding 2 or more variables that have large proportions of variance (.50 or more) that correspond to large condition indices. A rule of thumb is to label 'large' those condition indices in the range of 30 or larger proportions (*Pedhazur, p. 303*).

In this case, for DOL, most of the variance (78 percent) is associated with number 2, which has an eigenvalue of .009 and a condition index of 18.456. Rest of DOL is associated with Number 3. DFL is almost associated with number 3. Thus, according to the above clarifications, there is no evident problem with collinearity (TABLE 8).

Standardized coefficients are interpreted as a change in $E(Y)$ measured in units of SDs, for a one SD change in X_i holding all other X constant. The idea is that it makes the β values more comparable to each other (*Andrew Noymer*). Observations of regression analysis indicate positive association between DOL and DCL with standardized coefficient 0.869 with corresponding p value less than 0.05. Hence increasing DOL by 0.27 (the standard deviation of DOL) increases DOL by 1(times) which increases DCL (on average) by 0.30 (i.e., $.869 \times 0.35 = 0.30$). It implies that the increase or decrease in DOL will significantly affect the DCL (TABLE 9).

However, regression coefficient of DFL is 0.210 with corresponding p value less than 0.05 indicates that increasing DFL by 1 standard deviation will increase standard deviation of DCL by $(0.210 \times 0.35) 0.07$. Hence DFL do affects

DCL but the extent of impact is less as compared to DOL. The intercept is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. In this case the intercept is -2.392 (TABLE 9).

Though the overall model was found to be statistically significant (p value being less than 0.05) because of the nature of association between DOL, DFL and DCL, the main concern was to find out individual impact of DOL and DFL on DCL. Therefore, null hypothesis is rejected (TABLE 9).

Association between FATA and D/E Ratio

It has been asserted that companies tend to match the maturity of their asset and liabilities. In general, best financing strategy is to match debt maturity with asset maturity. Thus long term debt should be associated with fixed asset. Companies having more fixed asset may also find it advantageous to issue more debt to take advantage of cheaper source. Therefore companies with higher proportion of fixed asset may use more long term debt funds (*Singla, 1996*). Following the above argument, an attempt has been made to observe the correlation between debt equity ratio and

FATA of RIL over last ten years to examine whether RIL is following the matching concept. Pearson correlation matrix exhibits statistically insignificant association between debt equity and FATA indicating that RIL is not following the matching concept strictly (TABLE 11).

Association between Risk and Return of RIL

According to theoretical prepositions, there should be positive association between risk and return i.e., positive association between business risk and operating profit, financial risk and owners' return and total risk and overall profitability i.e., ROCE (*Gupta & Sur, 2013*). However above results observed to be contradictory against established principals. Correlation between DOL and operating profit margin detected to be negative on the basis of three correlation measurement criteria, though the result found to be statistically insignificant according to all three correlation measurement criteria (TABLE 12).

Nevertheless, statistically significant association was observed in between FATA and operating profit margin according to all correlation measurement criteria. In case of financial risk and return, significant negative correlation

observed in between DFL and ROE whereas in case of DER and ROE the result was same but statistically insignificant. As far as association total risk and return was concerned, it was also observed to be negative and significant (TABLE 12).

CONCLUSION

In context of above study, both the risk; operating and financial risk exhibited rising trend during the study period, thus the combined effect was towards rising total risk of RIL. Though all the risks, namely operating, financial and total risks were observed to be rising at lower rate. During the concerned period, overall risk of RIL was more influenced by operating risk rather than financial risk. While comparing the slopes of DOL and DFL, the study observed noteworthy difference while slopes of FATA and D/E observed to be the same. Though, during the study period, capital structure of RIL observed to be almost consistent. However, positive association between business and financial risk observed in the study. In context of risk and return relationship, the study observed negative association (based on various correlation measurement criteria) between various risk and return indicators. However, findings of the study offers scope for

further study that may be executed to analyse underlying causes behind such association in context of RIL.

REFERENCES

- Andrew Noymer, UC, Irvine “standardized coefficients” retrieved from http://u.demog.berkeley.edu/~andrew/teaching/standard_coeff.pdf.
- Berges (1963), The effect of Capital Structure on Cost of Capital, Prentice Hall, New Jersey in Gupta Alok, Sur Devasish (2013), “Business and Financial Risk in Hindustan Unilever limited: An Emperical Analysis”, Asia Pacific Finance and Accounting Review, APIM, New Delhi, p.80.
- Bill McNeese ((2016)), Are the Skewness and Kurtosis Useful Statistics? <https://www.spcforexcel.com/knowledge/basic-statistics/are-skewness-and-kurtosis-useful-statistics>.
- Brigham Eugene F and Houston Joel F(2013), Fundamentals of Financial Management, Cengage Learning Publications, New Delhi, India, p.463,465,469.
- Chandra Prasanna (2016), Financial Management Theory and Practice, McGraw Hill Publications, India, p.75.
- Gahol M. James (1981) ‘Operating Leverage as a Determinant of Systematic Risk’ retrieved from [http://www.sciencedirect.com/science/article/pii/0148296381900230?via%3Dihubhttp://doi.org/10.1016/0148-2963\(81\)90023-0](http://www.sciencedirect.com/science/article/pii/0148296381900230?via%3Dihubhttp://doi.org/10.1016/0148-2963(81)90023-0).
- Gupta Alok, Sur Devasish (2013), “Business and Financial Risk in Hindustan Unilever limited: An Emperical Analysis”, Asia Pacific Finance and Accounting Review, APIM, New Delhi, pp.78-90.
- <http://financialmanagementpro.com/degree-of-combined-leverage-dcl/>
- <http://www.how2stats.net/2011/09/tolerance.html>.
- <http://www.how2stats.net/2011/09/variance-inflation-factor-vif.html>.
- <http://www.moneycontrol.com/financials/reliance/consolidated-balance-sheet/ri>.
- http://www.moneycontrol.com/stocks/company_info/print_main.php.
- <http://www.referenceforbusiness.com/history2/78/Reliance-Industries-Ltd.html>.
- <http://www.researchconsultation.com/multicollinearity-regression-spss-collinearity-diagnostics-vif.asp>.

<https://en.wikipedia.org/wiki/Kurtosis>.

<https://successstory.com/companies/reliance-industries-limited>.

<https://www.accountingformanagement.org/debt-to-equity-ratio/>

<https://www.newsweek.com/green-rankings-2017-18/reliance-industries-ltd>

Kapil Sheeba (2014) 'Financial Management', Pearson Publishing, New Delhi, p.250.

Khan M.Y.and Jain P.K. (2010), 'Financial Management', McGraw Hill Publications, New Delhi, p. 18.7.

Measures of Skewness and Kurtosis retrieved from <https://www.itl.nist.gov/div898/handbook/eda/section3/eda35b.htm>.

Pedhazur,p. 303 retrieved from <http://faculty.cas.usf.edu/mbrannick/regression/Collinearity.html>.

Putra Lie Dharma (2013), "Accounting Ratio Formula" retrieved from <http://accounting-financial-tax.com/2009/06/accounting-ratio-formula-most-common/>

Singh Surender and Kaur Rajiv (2015), 'Fundamentals of Financial Management', Mayur Paperbakcs, Noida, India, p.8.5.

Singla RK (1996), 'Corporate Capital Structure : Planning and Determinants' p. 68 retrieved from https://books.google.co.in/books?id=En8rSxhvJw0C&pg=PA68&lpg=PA68&dq=FIXED+ASSET+TO+TOTAL+ASSET+RATIO+as+determinant+of+business+risk&source=bl&ots=ruaw3f1PD6&sig=RCKE02sIpZMWQ0VhOCd8Oqx_xy4&hl=en&sa=X&ved=0ahUKEwih5d2n5Z3YAhUMo48KHVGUBcEQ6AEIJAA#v=onepage&q=FIXED%20ASSET%20TO%20TOTAL%20ASSET%20RATIO%20as%20determinant%20of%20business%20risk&f=false.

Tulsian P.C. (2010), 'Financial Management', S. Chand Publications, New Delhi, p. 7.1.

Wilkinson James (2013), 'Operating Leverage' retrieved from <https://strategiccco.com/operating-leverage/>

LIST OF TABLES

Table: 1					
Descriptive Statistics(2008-2017)					
	DOL	DFL	DCL	D/E RAIO	FATA
Mean	2.10	1.14	2.39	0.61	0.63
Median	2.12	1.13	2.41	0.64	0.64
Standard Deviation	0.27	0.03	0.35	0.09	0.09
CV	0.128	0.026	0.146	0.147	0.143
Kurtosis	-0.52	0.12	-1.23	-2.09	-1.36
Skewness	-0.28	0.31	-0.21	-0.29	-0.33
Range	0.87	0.12	1.03	0.21	0.23
Minimum	1.62	1.08	1.83	0.49	0.50
Maximum	2.49	1.19	2.86	0.70	0.73

Table:02					
	Operating Risk Indicators		Financial Risk Indicators		Total Risk Indicator
YEAR	DOL	FATA	DFL	D/E RATIO	DCL
2008	1.836955	0.65	1.07822	0.6	1.98
2009	1.619176	0.73	1.129228	0.7	1.83
2010	1.868273	0.68	1.120096	0.49	2.09
2011	2.024919	0.6	1.107495	0.54	2.24
2012	2.176258	0.5	1.148184	0.5	2.49
2013	2.181268	0.51	1.188719	0.5	2.59
2014	2.334138	0.54	1.19408	0.68	2.79
2015	2.494054	0.63	1.147371	0.68	2.86
2016	2.368144	0.69	1.130098	0.68	2.68
2017	2.056704	0.73	1.125379	0.7	2.31
Results	Average(2008-17): 2.10 Average(2008-12): 1.90 Average(2013-17): 2.29 -135.11+0.068t (3.38)*	Average(2008-17): 0.63 Average(2008-12): 0.63 Average(2013-17): 0.62 0.38+0.000121t (0.012)*	Average(2008-17): 1.14 Average(2008-12): 1.12 Average(2013-17): 1.16 -9.44+0.00525 (1.44)*	Average(2008-17): 0.61 Average(2008-12): 0.57 Average(2013-17): 0.65 -25.37+0.013 (1.35)*	Average(2008-17): 2.39 Average(2008-12): 2.13 Average(2013-17): 2.65 -174.62+0.088 (3.28)*

*Calculated t value

Source: Computed data

Table: 3

Pooled (DOL and DFL)	
St error	0.020555939
T	3.070677229
Df	16
P value	0.007315452

Source: Computed data

Table: 4	
Pooled (FATA and D/E Ratio)	
St error	0.013888
T	0.920779
Df	16
P value	0.370841

Source: Computed data

Table: 5			
Pearson Correlation matrix			
	DOL	DFL	DCL
DOL	1	0.547 (.051)	0.984 (.000*)
DFL	0.547 (.051)	1	0.686 (.014*)
DCL	0.984 (.000*)	0.686 (.014*)	1

*Significant at 5% significance level

Source: Computed data

Table: 6			
Normality Test			
Test	DOL	DFL	DCL
Shapiro-Wilk Test (p-Value)	0.948	0.588	0.776
Anderson Darling Test (p-Value)	0.992	0.852	0.982
Pass Normality Test P>0.05			

Source: Computed data

Table: 7		
Multicollinearity statistics		
	DOL	DFL
Tolerance	0.701	0.701
VIF	1.427	1.427

Source: Computed data

Table: 8					
Collinearity Diagnostics					
Dimenson	Eigenvalue	Condition Index	Variance Proportions		
			(Constant)	DOL	DFL
1	2.991	1.000	.00	.00	.00
2	.009	18.456	.02	.78	.01
3	.000	94.562	.98	.22	.99

Dependent Variable DCL

Source: Computed data

Table: 9							
Model Parameters							
	Unstandardized		standardized Coefficients		t value	P (2 tail)	Result at 5% significance level
	Coefficient	St. Error	Coefficient	St. Error			
Intercept	-2.392	.071		0.71	-33.645	< 0.0001	Significant
DOL	1.133	.009	0.869	.007	124.671	< 0.0001	Significant (H ₀ rejected)
DFL	2.116	.070	0.210	.007	30.195	< 0.0001	Significant (H ₀ rejected)
R-Square = 0.99				Std. Error of Estimate = .00616			
Analysis of Variance							
Source	Sum of Square	Degree of Freedom		Mean Sq	F	P value	
Regression	1.114	2		0.557	14672.682	< 0.0001	
Error	0.000	7		0.000			
Total	1.114	9					

Source: Computed data

Table: 10					
Residuals Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.8313	2.8606	2.3876	.35175	10
Residual	-.00520	.01063	.00000	.00543	10
Std. Predicted Value	-1.581	1.345	.000	1.000	10
Std. Residual	-.843	1.725	.000	.882	10

Table: 11		
Pearson Correlation matrix		
	D/E RATIO	FATA
D/E RATIO	1	0.556 (.095)

Source: Computed data

Table: 12					
RISK AND RETURN OF RIL					
Correlation Measure	Business risk and Return		Financial Risk and Return		Total Risk and Return
	FATA & Operating Profit Margin	DOL & Operating Profit Margin	DFL & ROE	DER & ROE	DCL & ROE
Pearson	0.842** (.002)	-0.621 (.055)	-0.685* (.029)	-0.282 (.431)	-0.824** (.003)
Spearman	0.796** (0.006)	-0.588 (.074)	-0.638* (.047)	-0.443 (.200)	-0.903** (.000)
Kendal	0.584* (.020)	-0.467 (.060)	-0.494* (.048)	0.310 (.232)	-0.778** (.002)

**Correlation significant at 0.01 level (2-tailed)

*Correlation significant at 0.05 level (2-tailed)

Figures in parentheses indicates p value

Source: Computed data

LIST OF FIGURES

Figure: 1
DOL

Figure: 2
FATA

Figure: 3
DFL

Figure: 4
D/E RATIO

Figure: 5
DCL

Figure: 6
DOL, DFL& DCL

Figure: 7