Relationship between Financial Ratios and Systematic Risk in Steel Industry: A study

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Abstract- The objective of this study is to determine the relationship between financial ratios and systematic risk of Steel industry. The financial variables that have been utilized for the study are Quick ratio, return on assets excluding Revaluations, Operating Profit Margin, Net Profit Margin, Debt equity ratio. Four years data from 2015 to 2018 have been collected from Yahoo Finance, National Stock Exchange, Moneycontrol.com. The consequences of 15 Steel Companies have been studied through the application of Pearson algorithm and the results are discussed elaborately in this paper. This work supports investors to decide on ventures for investment.

Index Terms- Systematic Risk, Quick Ratio, Net profit margin, Operational profit margin, Pearson Correlation, Debt equity ratio

I. INTRODUCTION

Systematic Risk is a part of total risk which is beyond the control of an individual or a company. Every investment or security is subjected to systematic risk therefore it is not a type of risk which can be diversified. Systematic Risk is a crucial factor for any investor. Investors tend to invest in companies which have a high return. To measure the Systematic Risk, beta is used. Beta varies from industry to industry. Financial Ratios are good indicators of a company's performance and its financial situation. Therefore relationship between Systematic Risk and the financial ratios can be used to find if we could invest in the company or not. Therefore, in this paper we will find the relationship between the financial ratios and Systematic Risk in companies related to the Steel Industries of India.

II. BACKGROUND

The total risk of a company includes Systematic Risk and Unsystematic Risk. Unsystematic Risk is specific to the firm, Systematic Risk is the market related risk. The Unsystematic risk can be reduced by diversifying the stocks therefore the main concern to the investors is the systematic risk. Gu and Kim(1998) suggested that the systematic risk (Beta) of each firm can be estimated by the equation or the characteristic line. The slope of the characteristic line of each company which is estimated against S&P 500 return represent the stock's return and its beta. Previous studies on financial ratios: The financial ratios in quick service and full service Restaurants were studied by Kim, Ryan and Ceschini (2007), the data from year 1999 to 2003 was utilized. According to the research the return on investment is found to be negatively correlated to beta. Debt to equity ratio was not very significant in the restaurant services. Kim et al (2007) estimated that there is a positive relation between quick ratio and risk(beta). Gu and Kim (1998) evaluated the current ratio, leverage ratio (total liabilities to total assets), asset turnover, and profit margin of 35 casino firms and found that only asset turnover was significant and negatively correlated

with Beta at the .10 level. All other variables were found to be statistically non significant. Further they also suggested that it is better to use quick ratio instead of current ratio as it represents the liquidity better. Till date, there has been no study which explored the relationship between Steel Industry in India and the financial Ratios.

III. PROPOSED SYSTEM

The ratios that are selected for consideration for our research are: -

Quick Ratio: The quick ratio is an indicator of a company's short-term liquidity position and measures a company's ability to meet its short-term obligations with its most liquid assets. [1]

Quick Ratio = (Cash + Marketable Securities + Accounts Receivable) / CurrentLiabilities

Return on assets: Return on total assets (ROTA) is a ratio that measures a company's earnings before interest and taxes (EBIT) relative to its total net assets.[2]

Return on assets = Net Income/Total Number of Assets.

Operating profit margin: Operating Profit Margin is a profitability or performance ratio used to calculate the percentage of profit a company produces from its operations, prior to subtracting taxes and interest charges. [3]

Operating profit margin = Operating profit/Total Revenue.

Net Profit Margin: Net profit margin is the percentage of revenue remaining after all operating expenses, interest, taxes and preferred stock dividends (but not common stock dividends) have been deducted from a company's total revenue. [4]

Net Profit Margin = Net Profit/Total Revenue.

Debt Equity ratio: The debt-to-equity (D/E) ratio is calculated by dividing a company's total liabilities by its shareholder equity.[5]

Debt Equity ratio = Total Liabilities/Total Shareholder's Equity.

The relation between each of the financial ratio and the Systematic Risk is analyzed.

The companies that were used for the research are :-
Large scale companies in steel industry:-

- JSW Steel Ltd.

- Tata Steel.
- Steel Authority of India Ltd.
- Manaksia Steels Ltd.
- Visa Steel Ltd.

Medium and small scale :-

- Jindal stainless and Power Ltd.
- Usha Martin Ltd.
- Mukand Ltd.
- Beekay Steel Industries Ltd.
- Shivalik Bimetal Controls Ltd.
- Kamdhenu Ltd.
- Vardhman Special Steels Ltd.
- Balasore Alloys Ltd.
- Panchmahal Steels Ltd.
- SAL Steel Ltd.

IV. ANALYSIS ON SYSTEMATIC RISK(β)

Systematic risk can be calculated by the sensitivity of a security's return with respect to market return. This sensitivity is calculated by using the β (Beta) Coefficient.
The value of Systematic Risk (β) can be calculated using the following formula:
β =Slope (Rp, Rm)
Rm: Market Return
Rp: Portfolio Return
The beta has been calculated by the taking the slope of the Market Return and the Portfolio Return. The tool that was used for the calculation of beta is Excel. The data for the Market Return and the Portfolio return has been extracted from Yahoo Finance.

V. RESULTS AND FINDINGS

Financial Ratios (Large Scale Industry) /Financial Years	FY18	FY17	FY16	FY15
JSW Steel				
Quick Ratio	0.68	0.56	0.41	0.67
Return on Assets Excluding Revaluations	115.98	100.28	84.44	1,032.60
Operating Profit Margin(%)	21.14	22.07	17.35	19.24

Net Profit Margin(%)	7.11	6.84	-9.61	4.7
Debt Equity Ratio	1.14	1.38	1.58	1.06
Tata Steel				
Quick Ratio	0.34	0.28	0.32	0.27
Return on Assets Excluding Revaluations	510.87	511.31	725.65	686.4
Operating Profit Margin(%)	26.46	24.74	18.87	23.95
Net Profit Margin(%)	6.99	7.17	12.82	15.41
Debt Equity Ratio	0.45	0.61	0.44	0.39

Steel Authority of India Ltd				
Quick Ratio	0.4	0.38	0.42	0.55
Return on Assets Excluding Revaluations	86.46	87.18	94.89	105.33
Operating Profit Margin(%)	8.02	0.08	-7.42	10.18
Net Profit Margin(%)	-0.83	-6.37	-10.29	4.57
Debt Equity Ratio	1.18	1.08	0.84	0.65
Manaksia Steels Ltd.				
Quick Ratio	1.69	4.04	3.25	2.78
Return on Assets Excluding Revaluations	26.88	24.35	23.4	22.64
Operating Profit Margin(%)	6.99	7.49	5.87	4.81
Net Profit Margin(%)	3.37	2.73	1.72	2.48
Debt Equity Ratio	0.53	0.36	0.35	0.3
Visa Steel Ltd.				

Quick Ratio	0.1	0.19	0.24	0.26
Return on Assets Excluding Revaluations	-68.52	-59.43	-41.92	11.13
Operating Profit Margin(%)	0.02	1.16	0.58	-0.22
Net Profit Margin(%)	-9.08	-10.21	-115.49	-26.18
Debt Equity Ratio	--	--	--	22.59

*The data has been extracted from moneycontrol.com

Table 1 : Financial Ratios of Large Scale Steel Industry for the period:- FY2015 – FY2018

Financial Ratios (Small and Medium Scale)/Financial year	FY18	FY17	FY16	FY15
Jindal Stainless				
Quick Ratio	0.4	0.44	1.64	1.42
Return on Assets Excluding Revaluations	49.07	42.96	-25.46	-7.64
Operating Profit Margin(%)	11.87	13.31	7.9	5.05
Net Profit Margin(%)	2.95	0.7	-5.9	3.71
Debt Equity Ratio	1.84	2.98	--	--
Usha Martin Ltd.				
Quick Ratio	0.38	0.37	0.39	0.31
Return on Assets Excluding Revaluations	5.69	14.95	26.66	39.26
Operating Profit Margin(%)	11.77	10.65	8.47	16.22
Net Profit Margin(%)	-6.99	-10.93	-12.22	-7.8
Debt Equity Ratio	20.06	7.78	4.6	2.8
Mukand Ltd.				
Quick Ratio	0.79	1.39	1.28	1.19

Return on Assets Excluding Revaluations	80.2	25.56	32.61	32.49
Operating Profit Margin(%)	2.02	13.13	12.2	11.99
Net Profit Margin(%)	1.43	0.42	0.05	0.05
Debt Equity Ratio	1.46	7.19	5.36	5.09
Beekay Steel Industries Ltd.				
Quick Ratio	1.81	1.42	1.14	0.94
Return on Assets Excluding Revaluations	157.53	121.59	102.05	93.13
Operating Profit Margin(%)	13.64	11.68	12.57	11.59
Net Profit Margin(%)	7.23	4.78	3.71	3
Debt Equity Ratio	0.59	0.78	0.82	0.91
Shivalik Bimetal Controls Ltd.				
Quick Ratio	1.49	1.64	1.99	1.52
Return on Assets Excluding Revaluations	22.2	37.1	33.85	31.7
Operating Profit Margin(%)	17.2	15.98	13.67	16.11
Net Profit Margin(%)	10.01	7.25	4.16	5.19
Debt Equity Ratio	0.36	0.36	0.57	0.64
Kamdhenu Ltd.				
Quick Ratio	1.6	1.62	2.07	1.93
Return on Assets Excluding Revaluations	54.96	49.11	45.16	42.52
Operating Profit Margin(%)	3.7	3.94	3.75	3.09
Net Profit Margin(%)	1.32	0.98	0.96	0.82
Debt Equity Ratio	0.68	0.92	1	0.98

Vardhman Special Steels Ltd.				
Quick Ratio	2.16	1.42	1.73	2.14
Return on Assets Excluding Revaluations	94.9	106.75	96.56	91.47
Operating Profit Margin(%)	7.2	8.88	6.37	1.74
Net Profit Margin(%)	2.91	2.84	0.64	-2.28
Debt Equity Ratio	0.65	1.28	1.65	2.02
Balasore Alloys				
Quick Ratio	0.9	0.87	0.71	0.56
Return on Assets Excluding Revaluations	103.57	101.47	52.9	55.12
Operating Profit Margin(%)	12.43	17.7	9.78	12.75
Net Profit Margin(%)	5.41	8.26	2.23	3.44
Debt Equity Ratio	0.18	0.2	0.32	0.3
Panchmahal Steels Ltd.				
Quick Ratio	0.58	0.55	0.52	0.52
Return on Assets Excluding Revaluations	63.39	63.67	63.51	70.11
Operating Profit Margin(%)	4.14	4.94	-0.63	2.7
Net Profit Margin(%)	0.13	0.08	-4.33	-0.9
Debt Equity Ratio	0.58	0.57	0.51	0.42
SAL Steel Ltd.				
Quick Ratio	0.48	0.43	0.27	0.26
Return on Assets Excluding Revaluations	0.45	-4.56	-4.13	-0.74

Operating Profit Margin(%)	1.27	2.65	6.87	7.14
Net Profit Margin(%)	8.49	0.24	-8.52	-20.75
Debt Equity Ratio	44.12	--	--	--

*The data has been extracted from moneycontrol.com

Table 2: Financial Ratios of Medium and Small scale industry for the period:- FY2015 – FY2018

Analysis on Systematic Risk (Beta)

Systematic Risk for Large Scale Industry /Financial Years	FY18	FY17	FY16	FY15
Tata Steel Ltd	-0.028	0.293	0.251	0.213
JSW Steel Ltd	-0.148	1.073	0.511	0.835
SAIL Ltd	-0.521	1.291	0.821	0.0195
Manaksia Steels Ltd	-0.021	0.081	0.552	-0.046
Visa Steel Ltd	0.088	0.468	1.503	0.180

*The following data has been calculated from Yahoo Finance website

Table 3: Systematic Risk associated with Large scale industry for the period:- FY2015 – FY2018

Systematic Risk for Medium and small scale Industry /Financial Years	FY18	FY17	FY16	FY15
Jindal Stainless	0.400	1.658	1.391	1.266
Usha Martin Ltd	0.619	0.111	1.105	0.722
Mukand Ltd	-0.180	-0.173	0.562	0.428
Beekay steel Ltd	0.583	-0.724	-0.148	
Shivalik Bimetal Controls Ltd	1.118	1.547	0.831	-0.289
Kamdhenu Ltd	0.248	-0.591	0.694	0.702
Vardhman Special Steel Ltd	0.405	-0.343	0.850	-0.483
Balasore Alloys	-0.284	1.295	1.396	0.741
Panchmahal Steels Ltd	0.153	0.504	-0.942	1.165
SAL Steel Ltd	-0.402	-0.209	0.691	1.325

*The following data has been calculated from Yahoo Finance website

Table 4: Systematic Risk associated with Medium and Small scale industry for the period:- FY2015 – FY2018

Correlation Analysis between Systematic risk and Financial ratios

This study was calculated by using Pearson's correlation coefficient on the 15 steel companies mentioned above.

Financial Ratios	**Correlation**
Quick Ratio	Negative Correlation
Return On Assets Excluding Revaluations	Positive Correlation
Operating Profit Margin	Negative Correlation
Net Profit Margin	Negative Correlation
Debt/Equity Ratio	Positive Correlation

Table 5: Correlation between Systematic Risk and Financial Variables

II. CONCLUSION

The main goal of an organization is to improve shareholders' value. The total risk of the investment is calculated and measured by the variance or, most commonly the Standard deviation of the return. To comprehend the parameters related with Systematic Risk is valuable for financial investors and company managers. This study finds the relation between systematic risk and quick ratio, return on assets excluding evaluations, operating profit margin, Net profit margin and Debt-Equity Ratio. Correlation analysis has been used for estimation. Study included 15 financial companies listed in NSE for the period of 2015 to 2018. Quick Ratio is negatively correlated with beta (β), Return on assets excluding revaluations is positively correlated with beta(β), Operating profit margin is negatively correlated with beta(β), Net profit margin is negatively correlated with beta**(**β**),** Debt/Equity ratio is positively correlated with beta(β). Managers can estimate these parameters to control systematic risk and to improve financial performance of a firm. Financial ratios do play an important role in finding systematic risk. This study is essential for investors and finance managers to understand what kind of relationship exist between financial ratios and systematic risk. The future research will involve larger number of ventures and more number of parameters for better analysis and results, which will support the investors for better decision on their investments.

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