Time Series Analysis of Profitability: A Study of Selected Infrastructure Sector Companies in India

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ABSTRACT

A nation's economic development has a link with many sector groups. All the sector groups draw their basic facilities from the infrastructure sector. Infrastructure is needed for development of any country, roads, railways, power, telecom, education, water supply, sanitation constitute infrastructure. This paper deals profitability analysis of ten selected Indian infrastructure sector companies. The annual data of the selected companies is obtained from the Capital Line Database. Selected infrastructure companies for the analysis are Burnpur Cement, Dalmia Cement, Deccan Cement, Godrej Property, Mangalam Cement, Puravankara, Sagar Cements, Shah Alloys, Surya Roshni, Tata Steel. Further, Ratios calculation is related to Operating Profit Margin, Gross Profit Margin, Net Profit Margin, return on Assets, return on Shareholders' funds, Assets Turnover, Fixed Assets Turnover, Shareholder Funds Turnover, Current Assets Turnover, Net Current Assets Turnover. Result shows that there is a significant difference in the financing pattern of different sectors. Financing of each sector is unique, and they have to be handled uniquely.

Keywords: Financing, Infrastructure, Public Private Partnership, Roads, Private Sector

I. INTRODUCTION

Governments of different countries all over the world take a leading role in development of infrastructure. There has been a debate on whether the exclusive domain of the governments to create infrastructure result in monopolies and consequential inefficiencies in the usage of the resources and money. This debate has led to the opening of certain spheres of infrastructure to the private sector in different forms. The private sector is using this opportunity to build infrastructure in many areas which are opened for their operation. It is three decades since India has opted for different models for developing infrastructure in India. Post 1991, Government of India (GOI) has allowed private players to contribute to the development of infrastructure. Over the years, Government has allowed foreign direct investment (FDI) in different sectors of the economy, including infrastructure sectors. While the percentage of the FDI remained low in the initial years of liberalization, it revised the FDI percentage from time to time.
Allowing the private participation is a good move taken by Governments which helps in the overall development. While it is a good move to attract private capital to develop infrastructure in the country, GOI should also understand the financing patterns of the companies involved in the development of infrastructure. The financial performance analysis in developed countries has been undertaken by Beaver (1977), Bird and McHugh (1977), Buckmaster and Saniga (1990), Osteryoung and Richard (1992) and they report that earnings on assets and equity are important to understand the profitability of an enterprise. Gnanavelu (1996) found that to increase profitability there is a need for good financial performance and minimum borrowing. Cinca et al. (2005) argues that size of a firm and the location of the firm impact the financial ratio structure. Blessing and Onoja (2015) found that combined leverage and operating leverage have impact on profitability. Manjunatha and Gujjar (2018a; 2018b) analyzed and found that net income of the organization is not enough to determine its efficiency unless profit margin, asset turnover, financial leverage is taken into consideration. In most of the developing countries there has been a debate on the level of efficiency of the state, public sector, and listed companies. Results of these findings have been debated again and again by many authors in the developed countries. For assessing the financing patterns of infrastructure companies, we have compute ratios based on the annual financial statements of companies in different infrastructure groups and interpret these ratios to understand how the companies in different sectors chose their finances. The paper is organized in four parts. Part 1 is the introduction; Part 2 presents objectives, and methodology; Part 3 analyses the results; Part 4 presents the summary and conclusions. References are given after Part 4.

II. Objectives and Methodology

2.1 We have set following objectives based on the evidence Manjunatha and Gujjar (2018)
- To assess the profitability of the selected infrastructure companies in India
- To assess the turnover ratio of the selected infrastructure companies in India

2.2 Hypotheses: Based on the available evidence on Manjunatha and Gujjar (2018) the following null hypotheses are formulated
Ho: Infrastructure sector based Indian companies are not able to generate positive return on equity for its shareholders.
Negations of above hypothesis are alternate hypothesis. We propose to test the above hypotheses in the Indian context by taking the data and sample described below.

2.2 Data and Sample:
For assessing the financing patterns of infrastructure companies, authors have computed the ratios based on the 10 years’ annual financial statements of companies from 2010 to 2019 in different infrastructure groups and interpret these ratios to understand the profitability and turnover ratio of the selected infrastructure companies in India. Selected infrastructure companies for the analysis are Burnpur Cement, Dalmia Cement, Deccan Cement, Godrej Property, Mangalam Cement, Puravankara, Sagar Cements, Shah Alloys, Surya Roshni, Tata Steel. Further, Ratios calculation is related to Operating Profit Margin, Gross Profit Margin, Net Profit Margin, return on Assets, return on Shareholders’ funds, Assets Turnover, Fixed Assets Turnover, Shareholder Funds Turnover, Current Assets Turnover, Net Current Assets Turnover.

III. Results and Analysis
Time series analysis and results are outlined in the following paragraph
Table 1: Shows the profitability and turnover ratio analysis for the Burnpur Cement. The return on asset
varies between 23.8 to -28.3. Current asset turnover ratio varies in between 0.3 to 2.6.

Table 2: Shows the profitability and turnover ratio analysis for the Dalma Cement. The operating profit margin varies between 10.4 to 23.5. Gross profit margin varies between 4.1 to 17.5. Return on shareholder’s fund varies between 18.7 to 48.6.

Table 3: Shows the profitability and turnover ratio analysis for the Deccan Cement. The operating profit margin varies between 11.6 to 25.1. Gross profit margin varies between 6.3 to 19.1. Return on shareholder’s fund varies between 24.4 to 54.2.

Table 4: Shows the profitability and turnover ratio analysis for the Godrej Property. The operating profit margin varies between 21 to 46.7. Gross profit margin varies between 6.2 to 39.1. Return on shareholder’s fund varies between 11.1 to 25.4.

Table 5: Shows the profitability and turnover ratio analysis for the Mangalam Cement. The operating profit margin varies between 5.9 to 32.8. Gross profit margin varies between 0.8 to 32.5. Return on shareholder’s fund varies between 9.8 to 54.7.

Table 6: Shows the profitability and turnover ratio analysis for the Puravankara. The operating profit margin varies between 21.6 to 54.4. Gross profit margin varies between 6.8 to 29. Return on shareholder’s fund varies between 13.9 to 25.2.

Table 7: Shows the profitability and turnover ratio analysis for the Sagar Cements. The operating profit margin varies between 8.4 to 45.9. Gross profit margin varies between 2.6 to 43.4. Return on shareholder’s fund varies between 10.5 to 81.1.

Table 8: Shows the profitability and turnover ratio analysis for the Shah Alloys. The operating profit margin varies between -34.7 to 45.1. Gross profit margin varies between -66.9 to 40.5. Return on shareholder’s fund varies between -88.7 to 36.3.

Table 9: Shows the profitability and turnover ratio analysis for the Surya Roshni. The operating profit margin varies between 6.3 to 8.1. Gross profit margin varies between 4 to 5.3. Return on shareholder’s fund varies between 27.9 to 50.4.

Table 10: Shows the profitability and turnover ratio analysis for the Tata Steel. The operating profit margin varies between 22 to 41.2. Gross profit margin varies between 17.3 to 35.5. Return on shareholder’s fund varies between 13.5 to 31.4.

Further, result found that there is no consistent growth in profit. We reject null hypothesis and accept alternate hypothesis that Indian infrastructure sector based Companies are able to generate positive return on equity for its shareholders.

IV. Summary and Conclusion

This paper has attempted to analyze time series analysis of profitability for the Indian infrastructure sector based companies. The overall conclusions of this study are summarized as follows:

- The analysis of profitability and turnover ratio shows that increase in the operating income margin and asset turnover it reflects positively on the return on equity.
- The analysis of return on equity shows positive for all the selected companies during the study period. We reject null hypothesis and accept alternate hypothesis that Indian infrastructure sector based companies are able to generate positive return on equity for its shareholders.

For future research direction, researchers can employ the DuPont model in other industries to see if it can explain the total variation in ROE as it has in the Indian infrastructure sector companies.

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Tables

Table 1: Time series analysis for Burnpur Cement

| Burnpur Cement | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 10.1 | 9.7  | 9.2  | 10.3 | 9.7  | 9.4  | 18.5 | -33.9 | -75.9 | 2.7  |
| Gross Profit Margin | 5.0  | 5.5  | 4.6  | 6.8  | 5.4  | 3.9  | 4.3  | -57.3 | -76.0 | 2.7  |
| Net Profit Margin | 2.3  | 1.8  | 2.1  | 3.6  | 2.9  | 1.4  | -24.8 | -80.0 | -105.4 | -14.5 |
| Return on Assets (Operating Profit to Total Assets) | 2.1  | 0.9  | 1.3  | 23.8 | 14.0 | 7.0  | 8.5  | -28.3 | -11.6 | 0.9  |
| Return on Shareholders | 4.7  | 3.2  | 5.1  | 9.8  | 8.6  | 7.0  | 16.8 | -57.5 | 7628.6 | -18.0 |
| funds(Operating Profit to Shareholders Funds) | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------------------------------------|------|------|------|------|------|------|------|------|------|------|
| Assets Turnover                             | 0.2  | 0.1  | 0.1  | 2.3  | 1.4  | 0.7  | 0.5  | 0.8  | 0.2  | 0.3  |
| Fixed Assets Turnover                       | 1.3  | 1.2  | 1.6  | 2.5  | 2.4  | 1.6  | 0.3  | 0.3  | 0.2  | 0.3  |
| Shareholder Funds Turnover                  | 0.5  | 0.3  | 0.6  | 1.0  | 0.9  | 0.7  | 0.9  | 1.7  | -100.5 | -6.7 |
| Current Assets Turnover                     | 0.5  | 0.3  | 0.5  | 1.9  | 1.4  | 0.7  | 0.5  | 0.9  | 1.1  | 2.6  |
| Net Current Assets Turnover                 | 0.7  | 0.5  | 0.7  | 4.6  | 3.4  | 1.4  | 0.8  | -0.4 | -7.8 | -10.1 |

Table 2: Time series analysis for Dalmia Cement

| Dalmia Bharat | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin             | 21.5 | 12.0 | 11.1 | 13.7 | 11.3 | 10.4 | 17.7 | 23.5 | 11.9 | 15.4 |
| Gross Profit Margin                 | 14.1 | 5.5  | 5.1  | 8.0  | 4.6  | 4.1  | 11.5 | 17.5 | 8.8  | 12.1 |
| Net Profit Margin                   | 5.6  | 0.2  | 0.1  | 1.7  | -0.3 | -0.3 | 3.5  | 10.9 | 5.9  | 8.9  |
| Return on Assets (Operating Profit to Total Assets) | 39.9 | 6.3  | 5.6  | 238.8 | 202.5 | 977.0 | 1882.8 | 15.8 | 11.7 | 12.1 |
| Return on Shareholders funds(Operating Profit to Shareholders Funds) | 37.1 | 20.0 | 21.1 | 34.4 | 27.7 | 28.1 | 48.6 | 32.2 | 18.7 | 20.9 |
| Assets Turnover                     | 1.9  | 0.5  | 0.5  | 17.4 | 17.9 | 93.9 | 106.4 | 0.7  | 1.0  | 0.8  |
| Fixed Assets Turnover               | 0.7  | 0.8  | 0.9  | 1.1  | 0.9  | 1.0  | 1.0  | 1.3  | 1.8  | 1.6  |
| Shareholder Funds Turnover          | 1.7  | 1.7  | 1.9  | 2.5  | 2.4  | 2.7  | 2.7  | 1.4  | 1.6  | 1.4  |
| Current Assets Turnover             | 3.2  | 0.8  | 0.7  | 17.3 | 17.8 | 93.8 | 106.3 | 1.3  | 2.1  | 1.4  |
| Net Current Assets Turnover         | 6.2  | 1.4  | 1.1  | 17.4 | 17.9 | 93.9 | 106.4 | 1.8  | 4.3  | 2.1  |
Table 3: Time series analysis for Deccan Cement

| Deccan Cements | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 25.1 | 17.9 | 20.2 | 11.6 | 13.3 | 13.4 | 17.5 | 20.5 | 15.5 | 15.9 |
| Gross Profit Margin | 13.9 | 7.7 | 13.3 | 6.3 | 7.2 | 8.1 | 15.2 | 19.1 | 14.5 | 14.7 |
| Net Profit Margin | 1.4 | 0.5 | 8.1 | 1.2 | 1.1 | 3.9 | 6.9 | 9.4 | 6.7 | 7.0 |
| Return on Assets (Operating Profit to Total Assets) | 15.0 | 14.7 | 30.1 | 4209.3 | 3505.3 | 4341.9 | 7349.4 | 20.9 | 18.0 | 18.8 |
| Return on Shareholders funds(Operating Profit to Shareholders Funds) | 44.4 | 39.7 | 54.2 | 30.1 | 25.8 | 27.5 | 40.6 | 30.7 | 24.4 | 25.9 |
| Assets Turnover | 0.6 | 0.8 | 1.5 | 363.5 | 263.7 | 324.9 | 419.3 | 1.0 | 1.2 | 1.2 |
| Fixed Assets Turnover | 0.6 | 0.7 | 1.1 | 1.1 | 0.8 | 0.9 | 1.2 | 1.4 | 1.6 | 1.9 |
| Shareholder Funds Turnover | 1.8 | 2.2 | 2.7 | 2.6 | 1.9 | 2.1 | 2.3 | 1.5 | 1.6 | 1.6 |
| Current Assets Turnover | 1.8 | 2.6 | 5.6 | 149.3 | 120.1 | 250.5 | 433.0 | 3.6 | 3.2 | 2.8 |
| Net Current Assets Turnover | 2.1 | 3.3 | 9.0 | 375.1 | 289.4 | 357.2 | 456.9 | 5.3 | 4.9 | 3.8 |

Table 4: Time series analysis for Godrej Property

| Godrej Property | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|----------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 46.7 | 41.6 | 33.4 | 23.0 | 21.0 | 37.4 | 31.1 | 35.7 | 35.1 | 29.0 |
| Gross Profit Margin | 39.1 | 32.2 | 20.3 | 16.2 | 9.7 | 18.4 | 6.2 | 22.9 | 16.8 | 15.7 |
| Net Profit Margin | 3.5 | 9.1 | 12.8 | 13.9 | 8.9 | 10.3 | 1.4 | 16.1 | 10.0 | 11.1 |
| Return on Assets (Operating Profit to Total Assets) | 5.6 | 5.1 | 3.7 | 628.2 | 723.4 | 714.0 | 561.6 | 7.9 | 7.1 | 8.9 |
| Return on Shareholders funds(Operating Profit to Shareholders Funds) | 23.6 | 23.2 | 12.6 | 14.9 | 12.3 | 16.2 | 11.1 | 21.9 | 25.4 | 20.7 |
Table 5: Time series analysis for Mangalam Cement

| Mangalam Cement | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 32.8 | 13.7 | 17.8 | 18.4 | 8.9  | 9.5  | 5.9  | 14.9 | 10.0 | 6.6  |
| Gross Profit Margin | 32.5 | 13.3 | 17.3 | 17.7 | 7.7  | 5.5  | 0.8  | 9.8  | 5.7  | 2.5  |
| Net Profit Margin | 18.3 | 7.3  | 9.1  | 10.3 | 4.4  | 2.1  | -2.6 | 4.0  | 1.0  | -0.8 |
| Return on Assets (Operating Profit to Total Assets) | 22.0 | 7.2  | 11.0 | 182.1 | 76.4 | 112.8 | 45.5 | 15.2 | 12.3 | 8.1  |
| Return on Shareholders funds(Operating Profit to Shareholders Funds) | 54.7 | 18.0 | 25.5 | 28.0 | 11.9 | 17.6 | 9.8  | 27.3 | 21.4 | 16.1 |
| Assets Turnover | 0.7  | 0.5  | 0.6  | 9.9  | 8.5  | 11.9 | 7.8  | 1.0  | 1.2  | 1.2  |
| Fixed Assets Turnover | 1.3  | 0.8  | 0.9  | 1.1  | 0.8  | 0.8  | 0.7  | 1.1  | 1.3  | 1.4  |
| Shareholder Funds Turnover | 1.7  | 1.3  | 1.4  | 1.5  | 1.3  | 1.8  | 1.7  | 1.8  | 2.2  | 2.4  |
| Current Assets Turnover | 2.3  | 1.5  | 2.0  | 8.2  | 7.7  | 7.5  | 5.3  | 3.2  | 3.6  | 2.7  |
| Net Current Assets Turnover | 3.9  | 3.0  | 5.0  | 16.3 | 16.1 | 21.0 | 14.6 | -84.8 | -76.7 | 27.5 |
Table 6: Time series analysis for Puravankara

| Puravankara | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 46.4 | 54.4 | 26.0 | 39.9 | 25.0 | 21.6 | 24.1 | 34.0 | 28.0 | 24.6 |
| Gross Profit Margin | 29.0 | 23.3 | 7.1 | 17.2 | 10.3 | 6.8 | 8.3 | 11.5 | 9.7 | 9.2 |
| Net Profit Margin | 22.3 | 19.8 | 4.5 | 11.2 | 7.4 | 6.0 | 6.0 | 9.2 | 7.8 | 6.0 |
| Return on Assets (Operating Profit to Total Assets) | 8.6 | 6.8 | 7.2 | 44.5 | 41.3 | 61.7 | 235.9 | 12.4 | 10.5 | 15.2 |
| Return on Shareholders funds (Operating Profit to Shareholders Funds) | 20.0 | 15.5 | 18.0 | 25.2 | 19.8 | 15.2 | 16.2 | 17.8 | 13.9 | 23.0 |
| Assets Turnover | 0.2 | 0.1 | 0.3 | 1.1 | 1.6 | 2.9 | 9.8 | 0.4 | 0.4 | 0.6 |
| Fixed Assets Turnover | 0.5 | 0.4 | 10.8 | 8.9 | 11.7 | 9.1 | 8.9 | 13.3 | 7.7 | 12.4 |
| Shareholder Funds Turnover | 0.4 | 0.3 | 0.7 | 0.6 | 0.8 | 0.7 | 0.7 | 0.5 | 0.5 | 0.9 |
| Current Assets Turnover | 0.2 | 0.1 | 0.3 | 2.8 | 3.7 | 4.2 | 17.3 | 0.2 | 0.2 | 0.3 |
| Net Current Assets Turnover | 0.3 | 0.2 | 0.4 | 3.6 | 4.4 | 6.3 | 18.1 | 0.5 | 0.6 | 1.2 |

Table 7: Time series analysis for Sagar Cements

| Sagar Cements | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 17.7 | 15.7 | 21.0 | 10.3 | 8.4 | 45.9 | 19.2 | 14.8 | 18.1 | 12.5 |
| Gross Profit Margin | 11.8 | 9.7 | 15.2 | 5.7 | 2.6 | 43.4 | 14.7 | 9.3 | 14.3 | 8.9 |
| Net Profit Margin | 3.9 | 2.6 | 7.4 | 0.9 | -5.3 | 3.8 | 7.7 | 2.2 | 6.4 | 2.9 |
| Return on Assets (Operating Profit to Total Assets) | 16.8 | 9.8 | 15.4 | 101.7 | 74.1 | 477.9 | 77.1 | 7.7 | 12.1 | 9.2 |
| Return on Shareholders funds (Operating Profit to Shareholders Funds) | 41.7 | 36.7 | 48.0 | 25.6 | 17.7 | 81.1 | 22.5 | 10.5 | 16.9 | 12.7 |
| Shareholders funds (Operating Profit to Shareholders Funds) | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-----------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
| Assets Turnover                                           | 1.0  | 0.6  | 0.7  | 9.9  | 8.8  | 10.4 | 4.0  | 0.5  | 0.7  | 0.7  |
| Fixed Assets Turnover                                     | 1.1  | 1.1  | 1.2  | 1.3  | 0.9  | 1.7  | 0.9  | 1.0  | 1.1  | 1.1  |
| Shareholder Funds Turnover                                | 2.4  | 2.3  | 2.3  | 2.5  | 2.1  | 1.8  | 1.2  | 0.7  | 0.9  | 1.0  |
| Current Assets Turnover                                   | 3.0  | 1.1  | 2.7  | 58.1 | 39.9 | 43.3 | 17.4 | 1.5  | 2.7  | 2.8  |
| Net Current Assets Turnover                               | 12.6 | 1.5  | 7.4  | 69.1 | 47.9 | 71.8 | 26.8 | 2.5  | 6.6  | 12.8 |

Table 8: Time series analysis for Shah Alloys

| Shah Alloys                                      | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|-------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin                         | 2.6  | -8.7 | -16.6| -7.7 | -15.7| -34.7| 45.1 | 19.3 | 21.9 | 1.3  |
| Gross Profit Margin                             | -6.2 | -20.3| -29.9| -23.3| -38.9| -66.9| 40.5 | 15.6 | 21.8 | 1.3  |
| Net Profit Margin                               | -7.3 | -17.4| -23.2| -16.9| -31.9| -43.8| -11.3| 9.4  | 5.8  | 1.3  |
| Return on Assets (Operating Profit to Total Assets)| 12.3 | 140.7| -234.6| -70.6| -86.3| -74.8| 184.5| 124.8| 127.1| 29.8 |
| Return on Shareholders funds (Operating Profit to Shareholders Funds) | -49.8 | 36.3 | 33.7 | 10.3 | 11.0 | 10.6 | -62.1 | -28.7 | -88.7 | -4.9 |
| Assets Turnover                                 | 4.6  | -16.2| 14.1 | 9.1  | 5.5  | 2.2  | 4.1  | 6.5  | 5.8  | 23.3 |
| Fixed Assets Turnover                           | 1.5  | 1.3  | 1.3  | 1.1  | 0.7  | 0.4  | 0.9  | 2.5  | 4.4  | 4.5  |
| Shareholder Funds Turnover                      | -1.8 | -4.2 | -2.0 | -1.3 | -0.7 | -0.3 | -1.4 | -1.5 | -4.1 | -3.8 |
| Current Assets Turnover                         | 3.5  | 5.5  | 6.3  | 13.1 | 8.8  | 3.5  | 6.8  | 2.9  | 6.2  | 3.5  |
| Net Current Assets Turnover                     | -1.8 | -1.1 | -1.5 | 15.9 | 11.3 | 4.6  | 10.0 | -0.9 | -2.2 | -1.7 |
Table 9: Time series analysis for Surya Roshni

| Surya Roshni | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|--------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 7.0  | 7.9  | 7.7  | 8.1  | 7.7  | 7.9  | 7.8  | 8.1  | 7.1  | 6.3  |
| Gross Profit Margin | 4.4  | 5.3  | 4.0  | 4.4  | 4.0  | 4.1  | 4.7  | 5.2  | 4.9  | 4.4  |
| Net Profit Margin | 2.4  | 2.9  | 2.0  | 2.4  | 1.7  | 1.8  | 2.0  | 2.2  | 2.2  | 2.0  |
| Return on Assets (Operating Profit to Total Assets) | 7.1  | 10.2 | 11.0 | 86.8 | 18.9 | 7.2  | 5.0  | 14.9 | 15.4 | 15.5 |
| Return on Shareholders funds(Operating Profit to Shareholders Funds) | 50.4 | 28.8 | 28.8 | 32.5 | 30.7 | 28.0 | 27.9 | 33.0 | 33.3 | 32.7 |
| Assets Turnover | 1.0  | 1.3  | 1.4  | 10.7 | 2.5  | 0.9  | 0.6  | 1.8  | 2.2  | 2.5  |
| Fixed Assets Turnover | 2.2  | 1.9  | 2.0  | 2.1  | 2.1  | 1.8  | 1.9  | 3.5  | 4.5  | 5.4  |
| Shareholder Funds Turnover | 7.2  | 3.6  | 3.7  | 4.0  | 4.0  | 3.5  | 3.6  | 4.1  | 4.7  | 5.2  |
| Current Assets Turnover | 1.7  | 2.2  | 2.3  | 7.7  | 1.8  | 0.7  | 0.6  | 2.6  | 2.8  | 3.2  |
| Net Current Assets Turnover | 2.1  | 2.8  | 3.1  | 13.5 | 3.4  | 1.2  | 0.9  | 4.0  | 4.3  | 4.8  |

Table 10: Time series analysis for Tata Steel

| Tata Steel | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------------|------|------|------|------|------|------|------|------|------|------|
| Operating Profit Margin | 38.9 | 41.2 | 36.4 | 28.7 | 31.6 | 27.6 | 22.6 | 23.9 | 22.0 | 31.2 |
| Gross Profit Margin | 31.8 | 35.5 | 31.0 | 24.0 | 27.3 | 23.3 | 19.2 | 18.3 | 17.3 | 27.3 |
| Net Profit Margin | 17.0 | 20.5 | 17.1 | 13.5 | 15.0 | 10.5 | 7.8  | 7.1  | 7.0  | 14.4 |
| Return on Assets (Operating Profit to Total Assets) | 10.8 | 12.5 | 12.2 | 406.8 | 249.9 | 165.6 | 100.8 | 12.6 | 13.2 | 20.4 |
| Return on | 27.4 | 27.0 | 24.8 | 20.6 | 22.0 | 18.7 | 13.5 | 23.3 | 20.7 | 31.4 |
| Shareholders funds (Operating Profit to Shareholders Funds) | Assets Turnover | Fixed Assets Turnover | Shareholder Funds Turnover | Current Assets Turnover | Net Current Assets Turnover |
|-----------------------------------------------------------|----------------|----------------------|---------------------------|-------------------------|---------------------------|
|                                                           | 0.3            | 1.2                  | 0.7                       | 2.8                     | -4.7                      |
|                                                           | 0.3            | 1.3                  | 0.7                       | 2.8                     | -20.8                     |
|                                                           | 0.3            | 1.5                  | 0.7                       | 3.5                     | -7.4                      |
|                                                           | 14.2           | 1.0                  | 0.7                       | 118.1                   | -420.0                    |
|                                                           | 7.9            | 1.1                  | 0.7                       | 37.7                    | 111.1                     |
|                                                           | 6.0            | 1.1                  | 0.7                       | 36.6                    | -111.5                    |
|                                                           | 4.5            | 0.9                  | 0.6                       | 18.0                    | 157.2                     |
|                                                           | 0.5            | 0.6                  | 1.0                       | 3.3                     | -9.7                      |
|                                                           | 0.6            | 0.8                  | 0.9                       | 3.3                     | -8.9                      |
|                                                           | 0.7            | 1.0                  | 1.0                       | 5.1                     | -6.6                      |