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An Analysis of Financial Performance of the Coal Mining Industries: A Case Study of Raniganj Coalfield of Eastern Coalfield Limited

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Authors' contributions

This work was carried out in collaboration with both authors. Author GM collected the data, managed the literature searches, designed the study, wrote the first draft of the manuscript, and performed the statistical analysis and interpretation. Author USM assisted and supervised the study with valuable suggestions and critical revision of each and every aspects of the research article. All authors read and approved the final manuscript.

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ABSTRACT

The leading coalfield of India, the Raniganj coalfield under Eastern Coalfield Limited is recognised as the birth place of the Indian coal mining industry and one of the most prominent coalfields not only in India but also in the world. It is also the second largest supplier of superior quality of coal in the nation at present subsequent to Jharia coalfield. Raniganj and Jharia Coalfields (RCF & JCF) can be recognised as mirror image in the history of coal mining in India. Both the coal mining areas are witnessing mining of coal for more than 230 years. With the shifting of economic structure of the country, the cold filed region has registered quite a lot of ups and down in its financial performance. From this point of view the current paper is an attempt to assess the financial performance in the field of mining segment of Raniganj Coal Field, the most important coal producer in West Bengal. The whole study is entirely based on secondary data. A period of five year from 2014-15 to 2019-20 has been determined for the study. The data have been tabulated, analysed and interpreted with the help of Z Score Model and Economic Value Added (EVA) based on financial ratios. It is observed from the analysis of various financial ratios that the revenue earning capability, liquidity condition and long-standing solvency situation of RCF, is to a certain extent good during the entire study period and the level of bankruptcy situation is also very low.

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Keywords: Financial analysis; ratio analysis; mining sector; multivariate discriminate analysis (MDA); solvency; bankruptcy; economic value added.

1. INTRODUCTION

It is well-known fact that finance supposed to be the blood of life and the circulatory system of the economic activities in every aspect of business; that's why the significance of financial management & supervision practices has created a center of attention. For the reason that, the success of any business is fundamentally depends upon its efficient and successful financial management practices which starts with the investment of finances and ends with efficient operation of finances. Rao Y. Gouthama [1] stressed upon financial management having an impact on all aspect of the actions of firm. Well-organised financial management has to done for any financial organisation irrespective of its size, nature and ownership, control and manufacturing or service sector. It can be applied to any activity of financial organisation,. For that reason, constant financial analysis and investigation of financial position and outcome is mandatory to take corrective & remedial measures to fulfill the demand of the short-term and long-term necessities sufficiently. Here, Financial statements are the only sources for obtaining financial information, upon which the financial planning and decision making is conducted. The profit and loss account provides the data regarding the operating activities whereas balance sheet provides the worth of acquired assets and liabilities of the firm at a certain point of time. The absolute figures reported in the financial statements never provide the rationale idea of measuring the financial health strength of the company. That's why, the financial analyst should investigate the financial data in order to find out the strength and weaknesses of the company or business concerned, Pandey [2] has given conception on the subject of financial analysis, strengths and weaknesses of the company by appropriately establishing association between the items of the balance sheet and the profit and loss account.

In spite of having a lot of investigative and analytical tools in the hands of the financial analysts; Ratio Analysis is one of them commanding tool to determine the financial health of the company. Wen-Cheng LIN et Al [3] preferred to use the financial ratios which are the simplest tools for determining the financial performance of the firm. Single-handedly a single ratio does not meet the purpose. For that reason, it is very essential to merge the different ratios into a single standard of measure to determine the prospective of strength and weakness or sickness. Multivariate Discriminate Analysis (MDA) is very useful tool in this regard; here the effect of all ratios is combined for the use of MDA.

Discriminate Analysis has been extensively used to recognise and to set prediction about financial health of industrial units. Prof. Edward I. Altman [4] took 33 successful firms and 33 bankrupt firms and developed a model universally known as *Altman's Z-Score model*. The model consists of five ratios i.e. I) Net working capital to total assets, II) Retained earnings to total assets, III) Earnings before interest and tax to total assets, IV) Market value of equity to market value of debt, V) Sales to total assets .The ratios are multiplied by a set of factor (i.e. a coefficient developed by Prof. Altman) and consolidated to bring into being a single number was referred to as *Z-Score*.

Aiyabei [5] applied Z-Score model to evaluate the financial performance of small business firms in Kenya and discussed the theoretical dimension of a financially troubled firm. In the Indian context Gupta [6] attempted to build a forewarning method of corporate sickness based on the various financial ratios. Selvam et al. [7] studied to predict the financial health and capability of India Cements Ltd on the basis of empirical investigation. V. Dheenadhyalan [8] accepted Z-Score model to predict the corporate collapse of the Steel Authority of India Limited. The Z-Score of SAIL revealed a sign of increasing trend throughout the entire study period and it was finally concluded that the financial health of SAIL was good.

Altman [4] analysed the financial ratios to predict corporate economic failure. According to him the bankruptcy model has accuracy level of 93%; very successful in predicting unsuccessful and successful firms. Sina and Ali [9] used financial ratios to estimate the financial strengths and weaknesses of Khulna Newsprint Mills Ltd. He concluded that because of inefficiency of planning and mismanagement of working capital, operational incompetency, and old-fashioned store, unproductive credit policy, greater than before cost of raw materials, labour and overhead cost the financial position of the

company was not superb. Jahur and Parveen [10] followed Altman's MDA model to conclude the bankruptcy situation of Chittagong Steel Mills Ltd. They observed that the lacks of practical goals, strict govt. guideline are the most important reasons for the lowest level of bankruptcy. Ohlson [11] executed financial ratios to predict a firm's disastrous situation. According to him there are four driving factors distressing a firm's susceptibility, they are the firm's scale, financial structure, performance and liquidity. Hye and Rahman [12] conducted a research to review the performance of a small number of selected private sector general insurance companies in Bangladesh. The study discovered that the private sector insurance companies had made considerable improvement because of effective financial management. All these studies make obvious that the ratio analysis and MDA are good method to appraise firm performance.

Economic Value Added, which is in recent times greatly applied by investors. EVA was first published by Shawn Tully in the Fortune magazine in an article *'The Real Key to Creating Wealth"*. Later in 1982, the enterprise Stern Steward & Company developed the method Economic value added (EVA), which was focused on the conception of profitability of the enterprises. After that this method has become an innovative method to determine the success of enterprises. It has become able to change the perception of owners and investors as well in achieving economic profit and attaining value for owners Grant, J [13].

Stewart, G [14] defined economic value added as an operating profit reduced by costs associated with capital for achieving this profit, whereas operating profit refers to the profit earned by the fundamental operational activities of the enterprise. Young, D & O'Byrne [15] considered EVA as an indicator of net income from operating activities of the enterprise, which is reduced by the costs of capital. According to Pavelkova, D & Knapkova, A [16] economic value added determines the economic profit of an enterprise makes after the payment of all costs of capital. The concept of EVA is emphasised upon maximizing the economic profit of an enterprise and supports the managers to make better decisions Vochozka, M et all [17]. It creates the opportunity of monitoring the value creation in the enterprise and affects constant improvement of decision-making processes leads to better results of the enterprises. Besides, a positive EVA indicates healthy sign and value creation for shareholders whereas a negative EVA signifies distressed condition & value destruction Young, D [18].

The economic value added is a financial indicator that represents the value of the economic profit of the enterprise. It provides the owners of an enterprise with important information on the value formation and better performance of the enterprises Durisova, M [19]. The owners and managers can use this EVA as a tool to estimate the future value of the enterprise. In addition to the monitoring the creation of value for the owners, it has gradually become a tool for investment decision making processes & evaluation of the enterprise at all levels of operational activities and management system. Salaga, J et all [20] defined EVA as an advanced instrument of business performance measurement because of having evaluation criteria and possibility of application of this indicator in the system of management of the enterprise. According to Gupta, V and Sikarwar, E [21] economic value added is a better performance measure than traditional accounting measures.

1.1 Focusing Objectives of the Study

The present manuscript focuses on the following objectives-

First: To highlight the efficiency of financial management of the coal mines of the Raniganj Coal Field.
Second: To evaluate the financial performance of the coal mines of the Raniganj Coal Field.

2. METHODOLOGY

2.1 Data for the Study

The study is entirely based on secondary data collected from the published Annual Reports of Eastern Coalmines Limited. For the purpose of the present study Journals, other relevant published literatures have also been consulted to supplement the data.

2.2 Period of the Study

The study covered the period of six years from 2014-15to 2019-20.

2.3 Methods Used

The data have been tabulated, analysed and interpreted with the help of Altman's Z-Score Model as developed by Prof. Altman and Economic Value Added Model (EVA).

2.3.1The Z-Score model:

The Z-Score Model for predicting bankruptcy was published in 1968 by Edward I. Altman. The Z-Score Model can provide a significant idea about the financial strength of the company. To compute Z-Score, the results of each of five ratios are multiplied by a set of factor (i.e. a coefficient developed by Prof. Altman). The results of the multiplication are then added together to establish the company's Z-Score.

The Model is specified as:

Z = 1.2 X1 + 1.4 X2 + 3.3 X3+ 0.6 X4 + 1.0 X5

Where,

Z = The overall z-score
X1 = Net Working Capital/Total Assets (NWC/TA)
X2 = Retained Earnings/Total Assets (RE/TA)
X3 = Earnings before Interest and Tax/Total Assets (EBIT/TA)
X4 = Book Value of Equity/Book Value of Debt (BVE/BVD)
X5 = Net Sales/Total Assets (NS/TA)

Note that,

X1 Shows liquidity position to the total capitalization.
X2 Indicates cumulative profitability overtime and leverages.
X3 Expresses operating performance and productivity of assets.
X4 presents the long-term solvency position. It shows how much assets of an enterprise can decline in value before the liabilities exceeds the assets and the concern becomes insolvent.
X5 reveals the sales generating capacity of the assets.

If Z-Score is *below 1.8,* then the company is considered to be in *Red Zone (bankruptcy zone).*

* If Z-Score lays *between1.8 to 3.0,* then the company is considered to be in grey zone (safety zone).
* If Z-Score is *more than 3.0,* the company is said to be in *Green Zone (good financial health zone).*

So the higher is the score, the healthier will be the company (See Fig.1).

2.3.2 Economic Value Added Model:

The difference between net operating profit after tax (NOPAT) and weighted average cost of capital (WACC*C) is the most frequently used calculation of EVA indicator. The value of cost capital is made up of the total invested capital (C) and weighted average cost of capital (WACC) Johnson, R & Soenen, L [22].

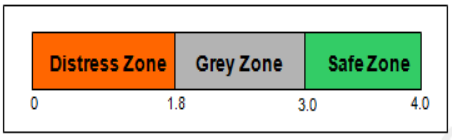

Fig. 1. Altman's Z-Score model

EVA = NOPAT - WACC*C (1)

Net operating profit after tax, except the profit from the main business, includes profit and loss on sale of fixed assets and inventories from extraordinary activities Stehel, V & Vochozka, M [23]. From the financial point of view, invested capital is the sum of all sources of enterprise funding, except for short-term trade payables. This means that it consists of the total amount of equity and long-term and short-term interest-bearing liabilities Grant, J [13]. The value of funds invested in the enterprise can be calculated from the operational point of view as the sum of long-term operating assets at residual value and working capital. Weighted average cost of capital (WACC) represents the last variable when determining the EVA indicator. The weight determines the ratio of alternative costs for both equity and debt funds in total. Calculation of weighted average cost of capital is defined as follows:

$$WACC = r_d (1- t)* \frac{D}{C} + r_e * \frac{E}{C} \quad (2)$$

Where, r_d represents the cost of foreign funds, t is the tax rate on income of legal persons, D represents foreign funds, C is total long-term invested capital, r_e is the cost of equity and E represents the value of equity.

The methodology for the application of the EVA was calculated in four steps (See Fig. 2).

2.4 Locational Identity of the Study Area

The area under study Raniganj Coalfield (RCF) under Eastern Coalfield Limited, the first well-known coalfield in India is the second most flourishing region in West Bengal after Hooghly Industrial belt, located in the Paschim

Fig. 2. Steps for calculation of economic value added

Bardhhaman district, West Bengal. The entire coalfield stretches an area about l560sq.km land including Mugma, Salanpur, Kasta and Mejia areas. Within West Bengal the area coverage is 1530 sq.km spreading over Paschim Barddhaman, Birbhum, Bankura and Purulia. The said area is bounded by 23°33'North and 23°52'45"North parallels and 86°37'East and 87°23' East meridians (See Fig. 2), bounded by the River Damodar in the south and the river Ajoy in the north.

The eastern boundary may be marked by the Andal - Sainthia railway line. There are twelve colliery areas in the Raniganj Coalfield and each colliery areas have several clustering of coal mines (See Fig. 2). Raniganj Coalfield, West Bengal was exclusively maintained by Eastern Coalfield Limited (ECL) is the nationalised coal company set up in 1973 under Coal India Limited (CIL). This area lies in Paschim Bardhaman district of West Bengal. Raniganj Coalfield, the *heart* of Eastern Coalfield Limited has been selected for its plentiful coal deposits. This is because a large industrial belt has also been developed from Asansol to Durgapur Industrial Region.

2.5 Brief History of Coal Mining in RCF

The history of very beginning of coal mining activities in India and that of Raniganj is very identical. The coal mining activity India was started in Raniganj area for the first time. J.C.K. Patterson in his book *"Bengal District Gazetteers" (Burdwan)* gave the all credit to Mr. Suetonius Grant Heatly, the collector of Chota Nagpur and Palamou., about the innovation of coal in the area of Panchet and Birbhum in between the rivers of Barakar and Damodar. In 1777, Sumner and Heately started production of coal for the first time.

2.6 First Phase of Development (1813-1830)

Actual exploration and extraction of coal in Raniganj area was started from the 19th century. In 1808, the Indian directors of East India Company recommended for an enquiry regarding the coal deposits in West Bengal, but that effort was not successful. Again the attempts began since1814. M/S Alexander & Co. shouldered the accountability to regenerate the mines in 1820. In 1823, Mr. Betts all over again started the extraction in Chinakuri colliery. In 1823 Mr. Jessop & Co. opened the mine in Damalia but premature ending happened by a lawsuit. This is how preparatory phase experienced more failure and disappointment than success and achievement.

2.7 Rapid Phase of Development (1830-1880)

Real development of Raniganj Coalfield occurred during the period 1830 to 1880. During this period the British Companies along with some of the then existing Indian Companies opened mines in various parts of RCF.

Afterward MISS Jessop & Company opened a mine in Naraiankuri in 1830. Mr. Humfrey opened mines in the similar year in Nuchibad, Chankidanga and Mamodpur In 1837, Tagore & Co. set up by Prince Dwarkanath Tagore also bought the Chinakuri mine form Betts. During the period from 1860 to 1875 was the golden period of coal mining industry in Raniganj. The Equitable Coal Company was established in 1874 and Barakar Coal Company in 1875. During the period of 1840 to 1880, RCF was witnessing the astonishing growth of various coal companies and their production.

2.8 Steady Phase of Development (1880-1947)

Establishment of coal industry in RCF registered a slow-moving rate of growth during 1880 - 1947. During the period of World War II, only 60 collieries were operating in the RCF. The significant collieries which were established during this period are, Barakar Coal Company Ltd. (1911), Oriental Coal Company (1907), The Searsol Coal Company Ltd. (1917), Mahabir Colliery Ltd. (1944), Khaskajora Coal Company Ltd. (1921), West Jamuria Coal Company Ltd. (1919), Churulia Coal Company Ltd. (1918) etc. 40 collieries were opened in the post World War II period.

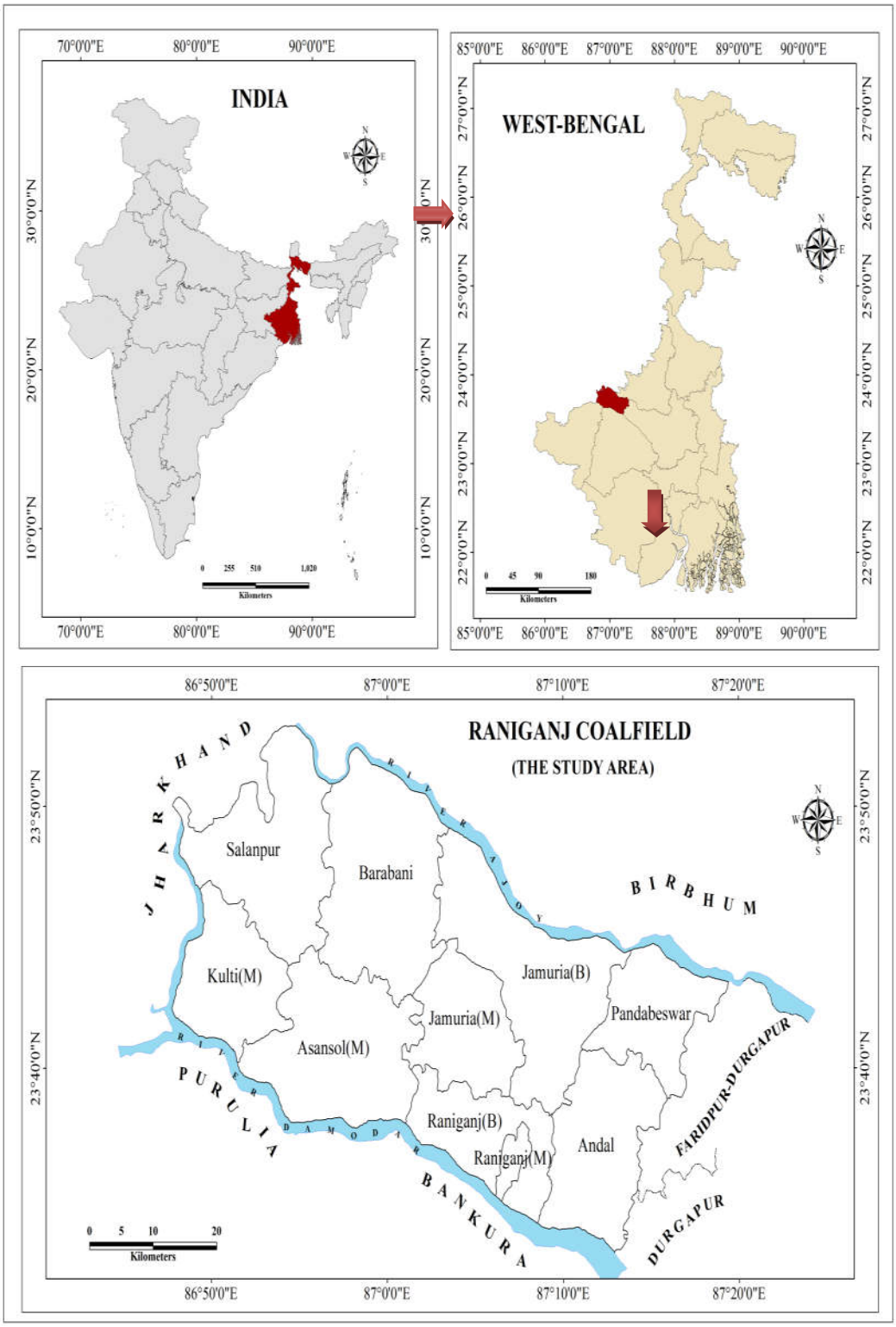

Fig. 3. Reference map of the study area

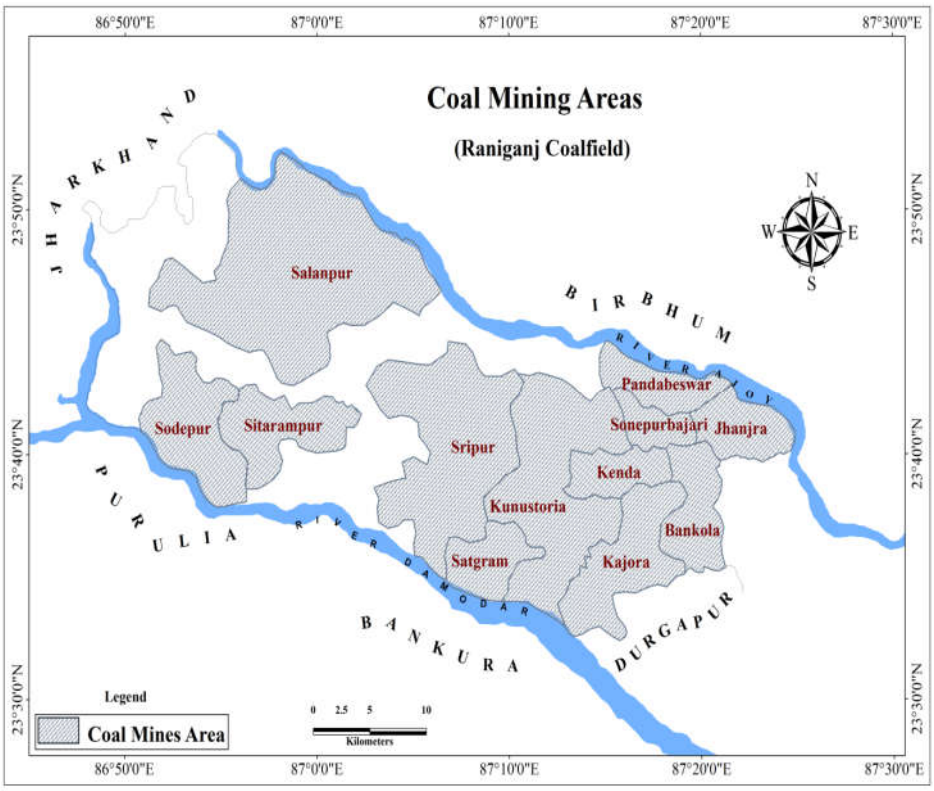

Fig. 4. Location of mining areas in Raniganj coalfield

2.9 Post-independence Phase of Development

The maximum numbers of collieries were established before independence and started their operation in between 1900-1907. The collieries which were set up during or after the independence are Gourangdih colliery (1947), The Chora Coal Company (1951), West Ghusick Coal Company (1947), Kajora Coal Mines (1945), Western Bengal Coalfield (1944), West Liakdihi Coal Company (1945) etc.

The significant consideration of coal mining after independence is the safety and security in mining operation. Advanced Mechanisation and modernization was started only in 1951. But during the period of 1951-1972, experienced advanced modern mechanisation of coal mining which enhanced quality and quantity of production within a decade.

2.10 Post Nationalisation Phase of Development

Post nationalisation state of affairs of RCF is very disappointing, diversified and experienced a declining trend during the period of 1973 to 1984-85. This decline is the result of closure of several private mines particularly in the areas of Sripur, Kajora, Satgram and Salanpur area. After 1985 the surprising growth of illegal or unauthorised mining due to deteriorating of nationalised coal mines. Coal India Limited then took the decision to curtail the surplus labour force to make itself a profitable and cost-effective. Consequently joblessness scenario geared up. Consequently the unemployed youths hurried towards the unlawful mining sites of Sripur, Pandaveswar, Salanpur, Sodepur Jamuria etc. Therefore, the last phase of development of coal mining is characterised by parallelism of coal mining activity led to diminishing production at the legal sector.

2.10.1 Trends of coal production & growth of employment in RCF

The chronological development of coal mining in RCF areas took place over spatially and temporally as well. This development of coal mines can be represented through the history of growth and economic point of view of coal mining in this area. Therefore a complete representation

of data and an important analysis of production and manpower dynamic are given to perceive the historicity of coal mining of this area.

History of coal mining in RCF is also associated with the scope for employment. But from the view point of growth pattern of employment prospect the RCF has not fulfilled the expected result. On the basis of the available records for the period of 2000-01 up to 2019-20, the manpower has been declined steadily but production of coal has been increased smoothly (See-Table 1 & Fig. 4).

Table 1. Trend of coal production & growth of manpower in RCF

Year	Coal Production (million tonne)			Productivity (million tonne)				Manpower
	U.G.	O.M.	Total	Growth %	U.G.	O.M.	Overall	
2000-01	11.77	16.26	28.03	10.38	0.47	4.52	0.98	127452
2001-02	11.66	16.89	28.55	1.8	0.48	4.92	1.04	119712
2002-03	10.95	16.23	27.18	-5.04	0.48	4.89	1.03	114582
2003-04	9.91	18.19	28	2.93	0.45	5.3	1.1	110132
2004-05	9.45	17.8	27.25	-2.75	0.43	5.3	1.07	105692
2005-06	9.33	21.78	32.11	15.13	0.45	6.61	1.29	101474
2006-07	8.27	22.2	30.47	-5.38	0.42	7.03	1.34	98780
2007-08	8.32	15.74	24.06	-26.64	0.43	5.04	1.07	94943
2008-09	8.39	19.75	28.14	14.49	0.46	6.42	1.33	90470
2009-10	8.23	21.83	30.06	6.39	0.47	7.29	1.56	85617
2010-11	8.23	21.83	30.06	0	0.45	8.14	1.6	81128
2011-12	6.83	23.725	30.55	1.61	0.44	8.64	1.68	78009
2012-13	6.85	27.05	33.9	9.88	0.46	10.17	1.94	74276
2013-14	6.87	29.18	36.05	5.96	0.48	10.96	2.12	71826
2014-15	7.29	32.72	40.01	9.89	0.53	12.12	2.45	68681
2015-16	7.33	32.88	40.21	0.49	0.56	12.42	2.56	66238
2016-17	8.13	32.39	40.52	0.76	0.64	12.9	2.64	64029
2017-18	8.6	34.97	43.57	7.01	0.72	14.32	3.01	61796
2018-19	9.06	41.1	50.16	13.14	0.78	17.02	3.58	59698
2019-20	9.21	41.19	50.4	0.47	0.82	17.36	3.72	57153

Source: Annual Report, Eastern Coalfield Limited

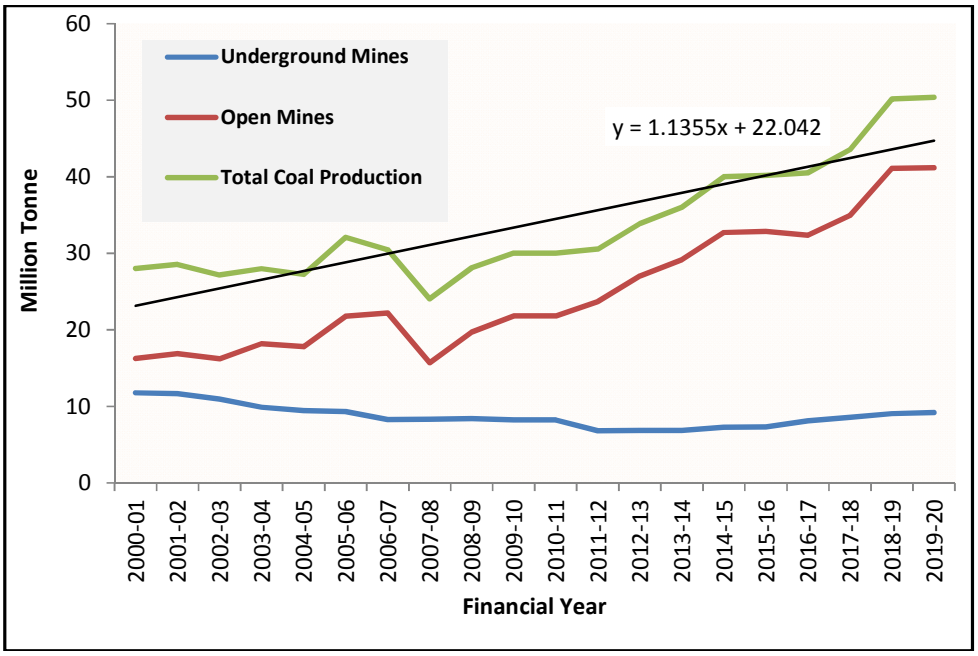

Fig. 5. Trend of coal production in RCF

3. RESULTS AND DISCUSSION

Financial Analysis is a course of action of evaluating the relationship between constituent parts of financial statement to get a better understanding of the company's financial position and performance. The analysis of financial statement can be best done by various yardsticks of measurement of which the significant is known as ratio analysis. Accounting ratios illustrate inter-relationship which exists among different accounting data. Ratio analysis is certainly a very marvelous and commendable device because of its simplicity and having a predictive value. Especially the management authority and other users thus can substantially rely on the financial ratios based upon accounting data for building assessments and predictions of earlier period performance, current position and possible future potentials and prospects. One significant way for diagnosing the financial health is to quantify the profitability, liquidity, activity and solvency and the level of the bankruptcy of enterprise.

Table-2 shows the Z-Score ingredients of RCF. The Z-Score model involves the following terms – Net working capital, Retained earnings, Earnings before interest and tax, Market value of equity, market value of debt and Sales.

Table-3 shows the ratios used in calculating Z-Score of RCF. The Z-Score model comprises the following ratios - Net working capital to total assets, Retained earnings to total assets, Earnings before interest and tax to total assets, Market value of equity to market value of debt, Sales to total assets.

Table-4 depicts the Z-Score of RCF from 2014-15 to 2019-20. It is revealed by the table that the Z-Score of RCF varies from 1.508 to 2.212. It was highest in the year 2014-15. So it can be concluded that the company is in safe position from 2014-15 to 2015-16 as the Z-Score of any year did not fall below 1.8 which is considered to be the bankruptcy zone. But during 2016-17 to 2017-18 the RCF was not in the safe position because the Z-Score was below 1.8 which is considered to be the bankruptcy zone for that period (See Fig. 6).

3.1 Working Capital to Total Assets

Working Capital is the surplus of total current assets or in other word it may be referred to as difference between the current assets and liabilities. So the working capital to total assets ratio determines the short term solvency or liquidity position of the company. Consistently operating losses will cause current assets to reduce in size relative to total assets. A negative ratio may arise from negative working capital, is a sign of financial weakness. The ratio of working capital to total assets of RCF has been given in the Table-3. The Raniganj Coal Field witnessed lowest ratio of .063 & .093 in the year 2017-18 & 2018-19 respectively. In initial phase of the study period the level of investment of current assets were high but after 2015-16 the working capital to total assets sharply decreased but since the 2018-19 it again started increasing because of investment in the form of current assets (See Fig. 7).

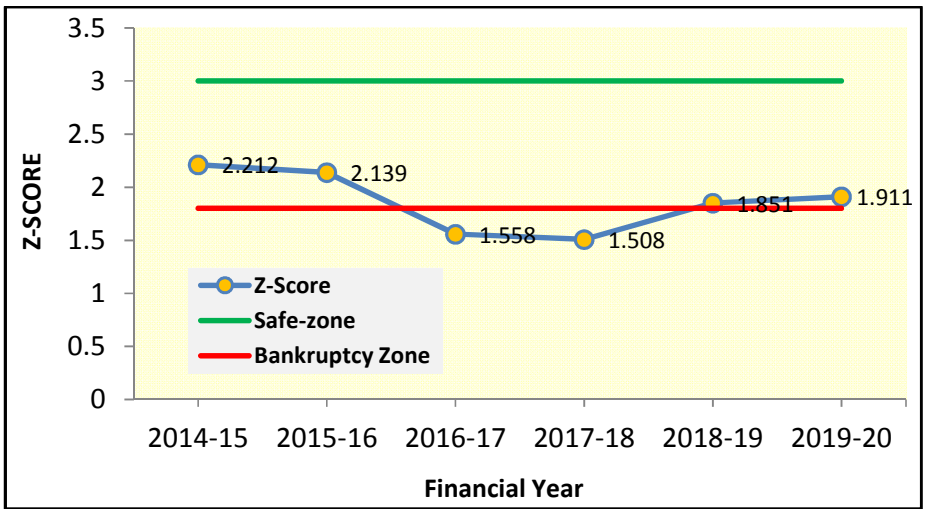

Fig. 6. Graphical presentation of the Z-Score of RCF

Table 2. Z-Score ingredients of RCF

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	2019-2020
Net Sales	10,018.54	10,219.45	10,141.18	10,626.01	12,914.35	12,823.74
Earnings before Interest & Tax	1782.41	1,222.69	51.9	1,466.73	1,298.39	1,501.35
Book Value of Debt	1,384.58	1,485.87	1,584.31	1,692.17	1,820.96	1,959.81
Book Value of Equity	354.86	1,145.53	1,166.30	342.13	1,048.51	1,882.88
Net Working Capital	2,125.43	2,402.99	1,754.27	811.62	1,215.35	1,769.05
Retained Earnings	1139.4	790.67	20.77	931.17	748.77	997.65
Total Assets	9,735.55	10,538.52	10,840.32	12,779.82	13,066.45	15,969.54

Source: Computed by the Authors compiling data from Annual Report. ECL (2014-15 to 2019-20)

Table 3. Statement showing the ratios used in Z-Score Analysis of RCF

Financial Ratios		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
X1	NWC to Total Assets	0.218	0.228	0.161	0.063	0.093	0.111
X2	R.E to Total Assets	0.117	0.075	0.001	0.072	0.057	0.062
X3	EBIT Total Assets	0.183	0.116	0.005	0.115	0.099	0.094
X4	BVE to BVD	0.256	0.771	0.736	0.202	0.576	0.961
X5	Net Sales to Total Assets	1.029	0.969	0.936	0.831	0.988	0.803

Sources: Computed by authors

Table 4. Statement showing the Z-Score of Coal Mines in RCF

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
1.2 *X1	0.262	0.274	0.193	0.076	0.112	0.133
1.4 *X2	0.164	0.105	0.001	0.101	0.079	0.087
3.3 *X3	0.603	0.328	0.016	0.379	0.326	0.311
0.6 *X4	0.154	0.463	0.442	0.121	0.346	0.577
1.0 *X5	1.029	0.969	0.936	0.831	0.988	0.803
Z-Score	2.212	2.139	1.588	1.508	1.851	1.911

Sources: Computed by authors

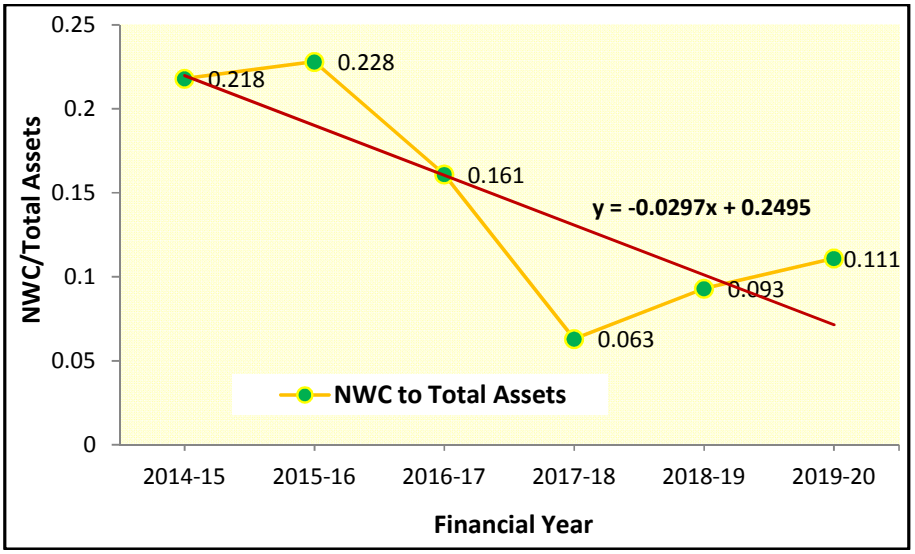

Fig. 7. Graphical Presentation of working capital to total assets

3.2 Retained Earnings to Total Assets

The ratio of retained earnings to total assets shows that how much share of total assets has been financed by retained earnings. Higher the ratio, greater will be the financial stability of company at the time of low profitability period. At the same time it also illustrates that the company is appropriately utilising its own earnings or finance rather than debt finance.

If we have close look at the Table-3 that total assets of RCF is merely financed not by its retained earnings, but also by debt finance during the study period. The company witnessed the lowest ratio of .001 in the year 2017. After that unstable period the company somehow managed to recover this worst situation and the ratio gradually began to increase. One thing is quite clear from the entire period of study that the debt finance has significantly been utilized rather than retained earnings. The trend of utilisation of the retained earnings to total assets during the period does not indicate the stable growth of RCF although it was slightly higher during the financial year of 2014-15 (See Fig. 8).

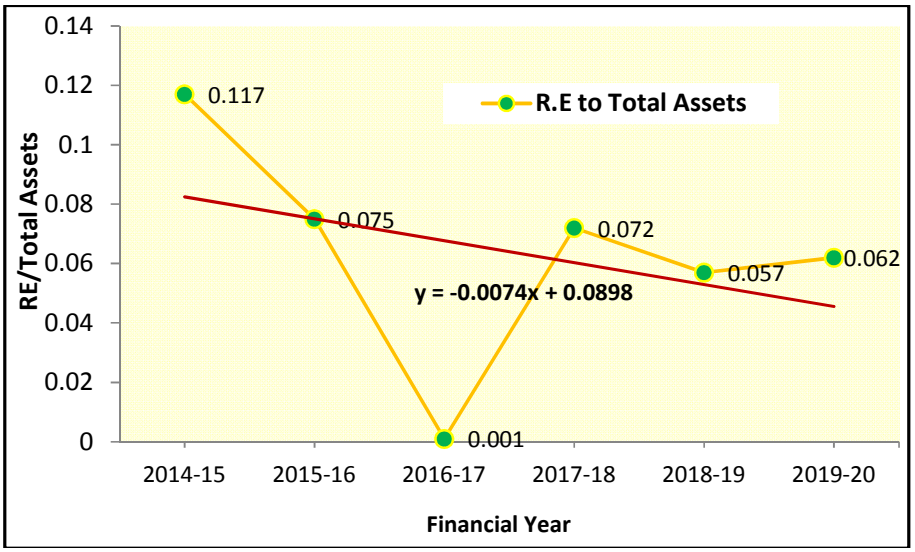

Fig. 8. Graphical presentation of retained earnings to total assets

3.2.1 Book value of equity to book value of debt

This ratio is used to determine the strength and weakness of long-term financial projects. The company having 1:1 equity debt is considered as rationally excellent position. Excessive debt tends to cause bankruptcy. If debt is more than the equity, it will certainly trim down the profitability of the company, regardless of increases the profitability of the shareholders. Higher ratio indicates minimum debt and the company is at low risk and better position whereas lower ration indicates maximum debt, so the company is at higher risk and not in good position at liquidation.

If we have close look at Table-3 then it reveals that the RCF registered lower ratio of 0.256 and 0.202 in the financial year 2014-15 and 2017-18 respectively, so it determines that on an average 80 percent of capital structure is comprises of debt with the exception of 2015-16, 2016-17 and 2018-19 experienced the ratio 0.771, 0.736, and 0.576 respectively, therefore it is quite clear that the company comprises its capital structure more than 50 percent from debt excluding the financial year 2019-20 witnessed the ratio 0.961, which signified that the capital structure was formed by the equity.

On the basis of the analysis it can be concluded that financial healthiness of RCF was quite good throughout the study period excluding 2014-15 and 2017-18 and it provides a complete secured condition to its creditors in times of insolvency (SeeTable-3 & Fig. 9).

3.2.2 Sales to total assets

Sales revenue plays a fundamental role on the whole financial performance of the company; because all the operations depend on the sales revenue. Sales to total assets ratio determine the supremacy of the assets in generating sales. Higher the ratio healthier will be the financial performance and poor ratio demonstrates the very poor financial management of the optimum utilisation of assets.

Sales to total assets ratio is referred to assets turnover ratio which is a significant indication about how a company is efficiently using its available assets to generate revenue, the higher the ratio indicates more efficient and healthier company whereas the lower ratio indicates inefficiency of the company in terms of generation of revenues from sales. Table-4 & Fig 10 clearly reveals that throughout the entire study period the ratio remained below 1 excluding 2014-15 financial year recorded the ratio 1.029 and after that the ratio continued declining the so it's a clear indication that RCF did not utilise its assets appropriately to generate sales. The ratio ranges from 0.803 to 1.029 during the study period. Therefore it may be suggested that RCF should take measures in case of utilisation of assets to generate sales.

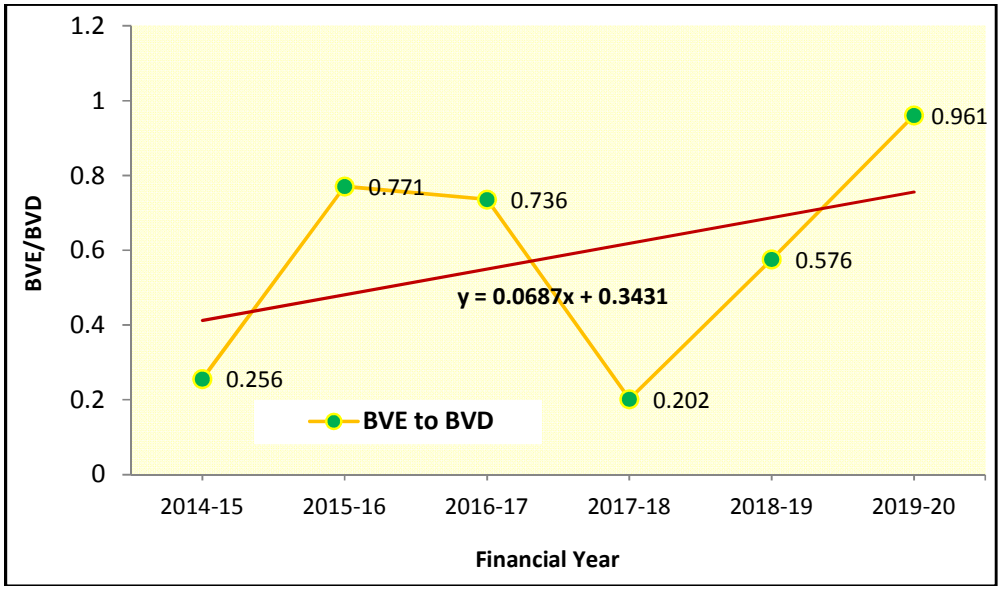

Fig. 9. Graphical presentation of equity to debt

3.3 Economic Value Added

The Raniganj Coalfield registered the highest value in 2014-15 because of growing value of profitable equity and at the same time low value of the cost of equity. The company even witnessed a high value in 2015-16, due to profitable return on equity reached then. It was not possible for the company to attain such a value in the subsequent years because of declining profitability. The most notable features observed during this period that the company registered negative EVA (2017-18 & 2018-19 financial year due to lack of ability of the company to recover its total resources is lower than the ability to recover only its own resources during this periods. Therefore it may be concluded that the economic value added attained lowest values than the net profit after tax in that specific periods. The overall trend of EVA of the company was declining throughout the entire study periods (See Table 5 & Fig. 11).

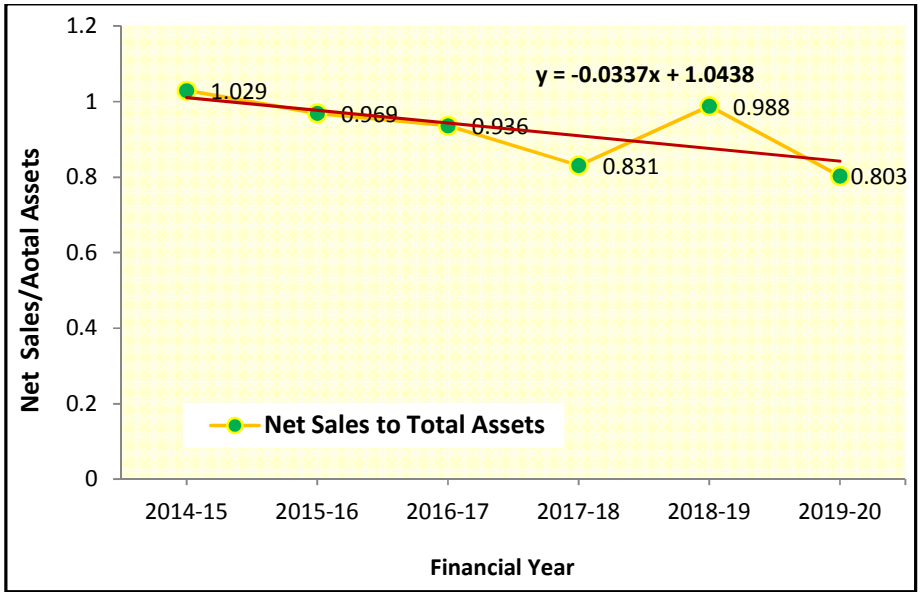

Fig. 10. Graphical presentation of net Sales to total assets

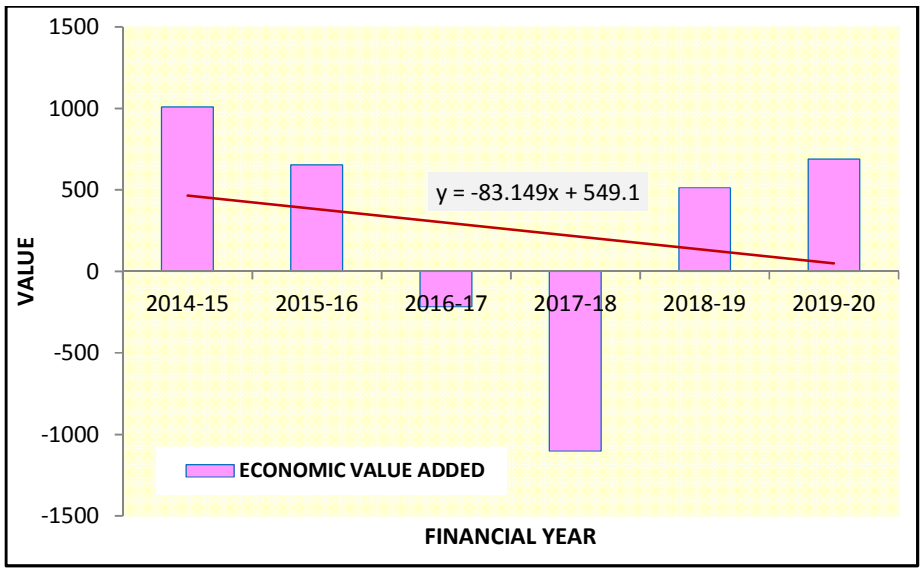

Fig. 1. Graphical presentation of economic value added

Table 5. Calculation of the economic value added EVA

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
1.Capital invested	4,589.75	5,027.76	4,876.79	4,397.19	5,126.04	6,026.93
2.Wieghted Average Capital Cost	2.83%	4.24%	4.57%	3.89%	4.58%	5.12%
3.Finance Charge	129.89	213.18	222.87	171.05	234.77	308.58
4.Net Operating Profit After Tax	1,139.40	868.02	6.13	-931.17	748.77	997.65
5.Economic Value Added (4 -3)	1009.51	654.84	-216.74	-1102.22	514.00	689.07

Sources: Computed by authors

4. MAJOR FINDINGS AND CONCLUSION

A company may face several ups and down in terms of financial performance perhaps due to financial mismanagement and if this financial sickness continues for a longer duration, there is a chance for that company to go into the condition of bankruptcy. Here Altman's Z-Score is very useful tool to predict the company's failure by comparing a company's Z-Score over a period of time so that the company make a better plan as to how the company should properly manage its financial resources. The lower the Z-Score, the more likely a company will go to the bankruptcy position. From above the analysis, it can be concluded that Z-Score of RCF over a period of six years from 2014-15 to 2019-20 is lies between1.508 to 2.212 (See Table-4). The RCF registered the lowest figure of Z-Score 1.508 and 1.588 in 2016-17 and 2017-18 respectively (See Table-4), this is below the safety level of 1.8 and that clearly indicates the bankruptcy position. If we compare the result regarding the financial performances of RCF obtained by Z- Score Model & economic Value Added Model then we get the same findings of the financial position of the RCF throughout the entire study periods. During the period of 2014-15 the RCF witnessed the highest score and then it was in healthy financial condition; at the same time EVA proves that during that period RCF achieved maximum economic profit. Z-Score shows that the company was in risky zone during 2016-17 & 2017-18, this condition is also reflected by the EVA reveals the negative value which signifies bankruptcy position of the company.

The problem of industrial sickness, be it mining industries or manufacturing industries, it's a kind of economic disease has become the global phenomena all over the world. The gravity of the situation will be clear from the following.

Production performance of the company during that period was not up to the mark, particularly in opencast mining there was big achievement gap between target figure & actual production due to geological disturbances, water logging due to rainfall, machine breakdown, and land acquisition and other problem (accident at Rajmahal Project on 26.12.2016 subsequent restriction imposed upon other opencast project, rehabilitation issues, dispatch constraints etc).

The coal mining in the Raniganj coalfield had started about 150 years back. Hence the company is loaded with old legacy of small mines, old steam winders working at 50% of its capacity & difficult geo-mining condition. But later the worst situation has been overcome because ECL has premium quality of coal with normal ash content less than 20% at Raniganj Coalfields, Mines are located along National Highway plus Eastern Railway facilitates easy evacuation and the most significant matter is that a large industrial belt is developed from Asansol to Durgapur which is principally resource based. Finally, it can be concluded that the overall financial health of RCF is in *Safety Zone* and the Raniganj Coalfield having a bright future.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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