

## Capital Structure & Long Term Solvency: A Study on Central Coalfield Limited

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### ABSTRACT

An efficient management of long term solvency of a firm is extremely important to meet its long term obligations and smooth running of the business. The failure of a firm to meet its long debts due to lack of sufficient fund may result in loss of creditors and bankers confidence on business. Long term solvency reflected by proportion of debt and owners funds, so it must ensure that it has an appropriate mixture of both and the company has a balanced capital structure. This balance capital structure affects control of the firm and the profitability both.

Considering the above facts, in this paper, long term solvency of Central Coalfield Ltd (CCL) is studied and analysed for the period 2006-07 to 2015-16 (ten years period )

using selective capital structure ratios to find out a picture of long term solvency with respect to industry (CIL) during the said period. This analysis helps to understand the financial standing and capability of CCL. Some statistical tools have been used in this study namely, arithmetic mean, standard deviation, coefficient of variation, Pearson's correlation coefficient analysis and student's "t" test to test the hypothesis for further interpretation of tabulated data. An attempt has been made in this paper to find out comparative strength and weakness of different aspect of long term solvency of CCL.

*Keyword*--A Study on Central Coalfield Limited

### Abbreviation;

CCL	Central Coalfield Limited
CIL	Coal India Limited
NWTDR	Net Worth to Total Debt Ratio
NWFAR	Net Worth to Fixed Assets Ratio
TDTAR	Total Debt to Total Assets Ratio
LDTDR	Long term Debt to Total Debt Ratio
ROTA	Return on Total Assets
MEAN	Arithmetic Mean
SD	Standard Deviation
CV	Coefficient of Variation

## I. INTRODUCTION

Long term solvency means the ability of an entity to pay its long term obligations with regard to periodic payment of interest on loan , repayment of debt on maturity or in predetermined installment of loan on due dates etc. Long term solvency is driven from capital structure of a firm. Capital structure indicates the proportion at which the firm raised long term capital from different sources i.e. debt capital and equity capital. It is obvious that any firm does have appropriate mixture of

debt and equity capital to have a balance capital structure at lowest possible cost and to maintain an optimum level of profit. Thus management of capital structure is very important aspect of long term solvency of a company.

The present study is based on comparative study of financial performance of Central Coalfield Limited (CCL) and Coal India Ltd which representing the industry. This study is based on analysis of comparative strength and weakness of CCL, which helps to understand the financial standing and capacity of CCL within coal industry.

### Profile of CCL and CIL:

Central Coalfield Limited (CCL) is a subsidiary of Coal India Limited (CIL). It was founded in November 1975, to manage the mines of CIL in central division. The corporate office of CCL is situated in Ranchi city, Jharkhand state of India. At present CCL has 62 operative mines and 7 coal washeries situated in the Jharkhand state. It is a Category –I Miniratna Company since October 2007. During 2015-16, its production reached to the highest ever figure of 67 million tone and net sales of Rs 13659 crore with operating profit of Rs 3119 crore.

Coal India Limited is a central Public Limited Maharatna Company Under ministry of Coal, Govt. of India. It came into existence in November 1975 when central government taken over private coal mines. Coal India today is a single largest coal producer in the world with production capacity of 538 million tones. The corporate office of CIL is situated in Kolkata. It is a holding company of seven coal producing subsidiaries which spreads over eight states of India. The seven coal producing subsidiaries of CIL are Eastern Coalfield Ltd (West Bengal), Central Coalfield Ltd (Jharkhand), Western Coalfield Ltd (Maharashtra), Mahanadi Coalfield Ltd (Orissa), Northern Coalfield Ltd (Madhya Pradesh), Bharat Coking Coal Ltd (Jharkhand), South Eastern Coalfield Ltd (Chhattisgarh).

In addition to above, CIL has acquired several coal mines in Africa. Today CIL produces about 84 percent of total coal production in India and command over 70 percent of coal market. It alone meets 40 percent of total demand of coal by thermal power plants in India. Due to its performance and financial strength, it was given Maharatna status in April 2011.

## II. LITERATURE REVIEW

S K Pan (2013) in his article “The analysis of long term capital and its impact on profits” in *Economika*, vol 93(2) has observed that financial structure is one of the approach in total cost reduction and it has a powerful impact on profit of the business.

Ganesh Chandra Chattopadhyay (2014) in his study “Long term solvency of Eastern Coalfield Limited: A comparative study towards exploring new strategies for better business” Excel Books, ISBN 978-93-83842-10, has observed that there is a significant association between long term solvency and profitability of firm.

Table: 01

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	MEAN	SD	CV
CCL	0.41	0.38	0.33	0.48	0.51	0.78	0.99	1.02	1.12	1.01	0.703	0.31	44.09
CIL	0.73	0.61	0.46	0.59	0.70	0.97	1.28	1.91	3.08	2.19	1.252	0.87	69.48

Sources: Annual Report of CCL & CIL

## III. OBJECTIVES OF THE STUDY

Following are the objectives of this study;

1. To make an analysis of long term solvency of Central Coalfield Limited with respect to Coal India Limited representing the Industry to find out a picture of long term solvency.
2. To measure correlation between long term solvency and profitability of Central Coalfield Limited.

## IV. HYPOTHESIS OF THE STUDY

Null Hypothesis:

$H_0: r = 0$  = There is no significant correlation between long term solvency and profitability of CCL.

Alternative Hypothesis;

$H_1: r \neq 0$  = There is significant correlation between long term solvency and profitability of CCL.

## V. METHODOLOGY

In this research paper, secondary data has been used which is collected from the annual reports of the companies for of Ten year period from 2006-07 to 2015-16. The classification and tabulation of financial data has been done as per need of the study. For analysis the data accounting ratios (four capital structure ratios) are used to test the efficiency of CCL and CIL in respect to capital. The statistical tools like arithmetic mean, standard deviation and coefficient of variances are used for the analysis and better interpretation of tabulated data. Pearson's Correlation Coefficient Analysis used to test the correlation between capital structure ratios and profitability of CCL and Student's "t" test has been used to test the hypothesis.

## VI. DATA ANALYSIS

### 1. Net Worth to Total Debt Ratio (NWTDR)

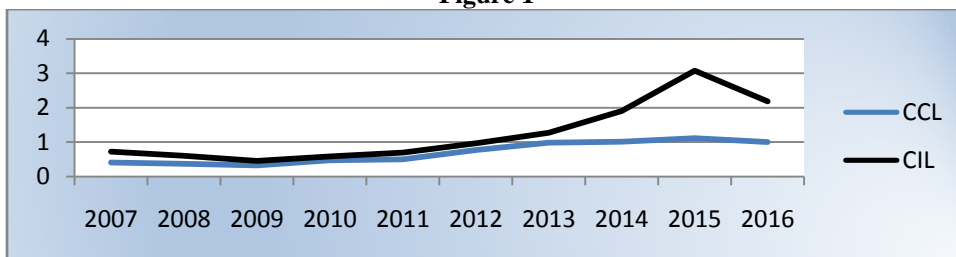
This ratio indicates the availability of net worth as a proportion of total debt. A high ratio indicates more internal strength and long term solvency of the company whereas a low ratio indicates more external liabilities and debts and association of financial risk in business.

$NWTDR = \text{Net Worth} / \text{Total Debt}$

From the table 01, we observed that CCL has a positive net worth which is showing a fluctuating trend during the study period. However the ratio of CCL for each year is below the long term solvency ratio of CIL which represents industry average. The performance of CCL is satisfactory with ten years average of Rs 0.70 for every rupee of debt compares to average of the industry

(CIL) Rs 1.252 for every rupee of debt. The standard deviation of CCL is 0.31 which shows a low variation in long term solvency during ten year's period compare to the industry variation of 0.87. Coefficient of variation shows that CCL having low volatility (44.09) compare to the industry (69.48).

Figure 1



The above figure 01, which is in support of table 01, clearly indicates CCL net worth for every rupee of debt is in steady increasing trend except for 2007-08 and 2008-09 due to more mixture of debt as compare to the industry.

**2. Net Worth to Fixed Assets (NWFAR)**

The basic objectives of this ratio is to find out what portion of fixed assets is financed from net worth.

Usually around 60 to 75 percent is supposed to represent full value of fixed assets and remaining part for working capital. A high ratio always indicates more stable position as fixed assets are protected by net worth of the business. In the other word we can say that what this ratio indicates what net worth firm has maintained for each rupee of fixed assets.

$$NWFAR = \text{Net Worth} / \text{Fixed Assets}$$

Table: 02

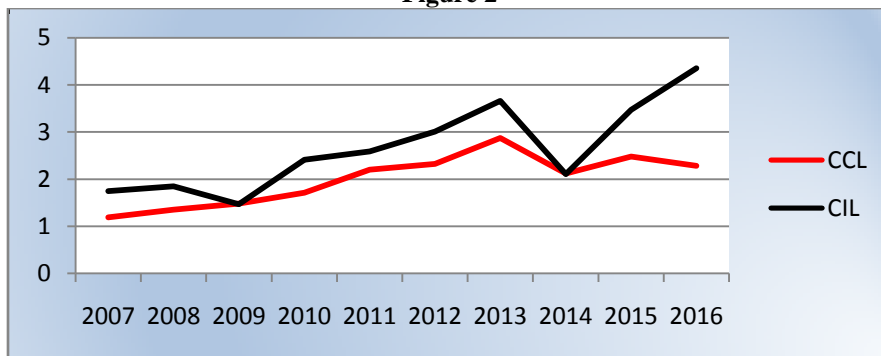
Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	MEAN	SD	CV
CCL	1.19	1.35	1.48	1.71	2.20	2.32	2.87	2.12	2.48	2.28	2.00	0.54	27
CIL	1.75	1.85	1.47	2.41	2.59	3.01	3.66	2.11	3.47	4.35	2.67	0.94	35.21

Sources: Annual Report of CCL & CIL

In the above table 2, NWFAR of the CCL and CIL showing a fluctuating trend during the study period. For CCL, net worth gave 2 times coverage to fixed assets compare to the industry 2.67 times during ten years study period. Analysis of coefficient of variation shows that CCL has low volatility in this ratio compare to CIL. It is evident from the trend analysis of this ratio that when CCL

improved this ratio from 1.19 to 2.28 i.e. around 192 percent during the study period, industry improved this ratio around 249 percent i.e. from 1.75 to 4.35. On the basis of this ratio and its trend during previous ten years, we can say that the performance of CCL is satisfactory in the industry.

Figure 2



### 3. Total Debt to Total Assets Ratio (TDTAR)

This ratio shows the proportion of debt capital used for financing the total assets of the firm. A high ratio indicates that debt capital is used is more than owners capital in financing assets and this signifies a risky

situation and implies unsuitable long term solvency position .Thus always a low ratio is desired by the stakeholders .

TDTAR= Total Debt/Total Assets

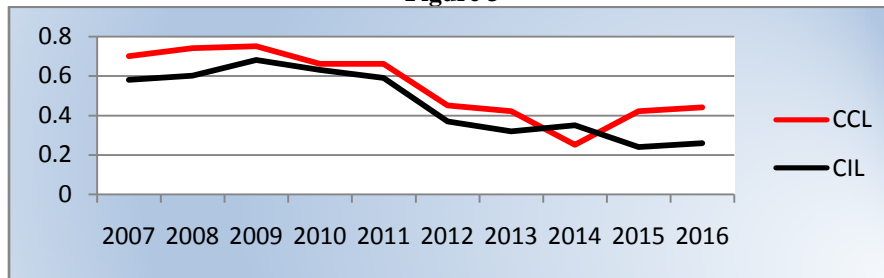
Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	MEAN	SD	CV
CCL	0.70	0.74	0.75	0.66	0.66	0.45	0.42	0.25	0.42	0.44	0.549	0.17	30.96
CIL	0.58	0.60	0.68	0.63	0.59	0.37	0.32	0.35	0.24	0.26	0.462	0.169	36.58

Sources: Annual Report of CCL & CIL

In the table 03, CCL has reduced the debt over total assets from 0.70 to 0.44 during ten years period but at lower rate as compared with CIL. CCL has maintained a higher debt capital to total assets as compared to CIL during the study period, however it indicates a sign of improvement in the situation year by year. On an average CCL has used a total debt of Rs 0.55 for every rupee of

total assets whereas the industry (CIL) has only Rs 0.46 of total debt compared to every rupee of total assets. The coefficient of variation indicates that CCL has low volatility as compared to CIL during the study period and this is due to low ratio of CIL compared to CCL and fast reduction of debt components in total assets.

Figure 3



The downward trend of this ratio indicates that proportion of total debt to total assets is decreasing over the years i.e. it indicates that the company is becoming less dependence on debt capital in financing its total assets which happens because of improving net worth of company due to continuous profit making.

### 4. Long term Debt to Total Debt Ratio (LDTDR):

This ratio demonstrates the use of long term debt as a proportion of total debt of a company. A high ratio indicates company depends more on long term loan.

LDTDR= Long term debt/Total Debt

Table: 04

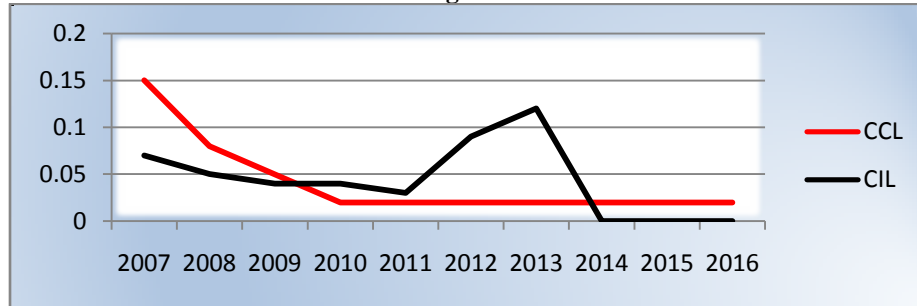
Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	MEAN	SD	CV
CCL	0.15	0.08	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.042	0.042	100
CIL	0.07	0.05	0.04	0.04	0.03	0.09	0.12	0.12	0.09	-	0.065	0.039	60

Sources: Annual Report of CCL & CIL

Table 04 shows that CCL has drastically reduced the use of long term debt after 2008-09. In the beginning of the study period CCL has high long term debt as compared to CIL but after 2008 the situation reversed. CCL has only 2 paise long term debt for each rupee of total debt compared to 9 paise for each rupee of total debt of CIL at the end of the study period. However this is very

conservative approach of CCL. The average for the study period is lower for CCL (0.042) compared to CIL (0.065). Coefficient of variation analysis of this ratio indicates that CCL has the highest variability in this ratio which is evident from the data as we see CCL has drastically reduced this ratio from 0.15 percent to 0.02 percent.

Figure 4



The downward trend of this ratio shows that proportion of long term debt to total debt is decreasing over the year. We can see that both CCL reduces its long term debt proportion very fast compares to industry.

This is the ratio which test the profitability of a business and rate of utilization of asset. A high ratio is always desirable because it represents most efficient utilization of assets and high profit earning ability on usage of assets. A low ratio indicates low profit earning on investment in assets.

5. Return on Total Assets (ROTA)

Table: 05

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	MEAN	SD	CV
CCL	18.07	14.47	8.62	19.05	20.74	19.71	26.28	23.02	19.59	20.12	18.97	4.75	25.04
CIL	19.96	17.90	9.92	19.68	20.23	19.88	20.54	26.04	26.49	24.59	20.52	4.75	23.15

Sources: Annual Report of CCL & CIL

In the table 05, ratio (ROTA) of CCL and CIL are showing fluctuating trend. The performance of CCL was almost equal to the industry till 2013-14, except 2010-11 and 2012-13, when earning ability of CCL was higher than industry but after it start decreasing. The overall

performance of CCL for the study period was just below the performance of the industry. The coefficient of variation indicates that CCL has high volatility as compare to CIL during the study period and this is due to the performance of CCL for 2013-14 to 2015-16.

Figure 5

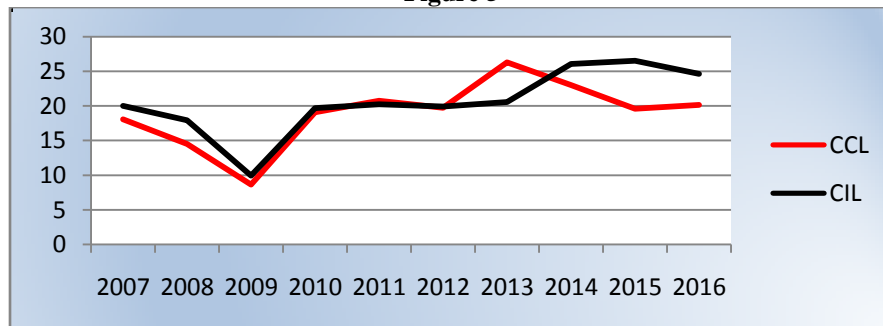


Table: 06

Correlations ( Using SPSS)						
		ROTA	NWTDR	NWFAR	TDTAR	LDTDR
ROTA	Pearson Correlation	1	.695*	.734*	-.717*	-.380
	N	10	10	10	10	10
NWTDR	Pearson Correlation	.695*	1	.831**	-.937**	-.571
	N	10	10	10	10	10
NWFAR	Pearson Correlation	.734*	.831**	1	-.750*	-.762*

	N	10	10	10	10	10
TDTAR	Pearson Correlation	-0.717*	-0.937**	-0.750*	1	.556
	N	10	10	10	10	10
LDTDR	Pearson Correlation	-0.380	-0.571	-0.762*	.556	1
	N	10	10	10	10	10

In the table 06, an attempt has been made to test the degree of association between long term solvency and profitability of the company by Karl Pearson's Correlation Coefficient (r). The capital structure position is examined by the capital structure ratios as mentioned earlier and profitability is measured by Return on Total Assets ratio (ROTA). Further to examine whether the computed value of such correlation coefficient is significant or not student's "t" test has been measured. The value of Pearson's correlation coefficient and test of "r" among various capital structure ratios of CCL has been shown in table 07.

#### Hypothesis;

Null Hypothesis:  $H_0: r = 0$  (There is no significant correlation between working capital structure & Profitability of CCL)

Alternative Hypothesis;  $H_1: r \neq 0$  (There is significant correlation between working capital structure & Profitability of CCL)

Test of Statistics "t"

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{n-2}$$

Table value of "t" at 5% level of significance and degree of freedom (n-2) i.e. 8 is = 2.306

Decision Rule: Reject Null Hypothesis & Accept Alternative Hypothesis if

Computed Value  $\geq$  Table Value ( $t_{n-2}$ )

Otherwise, Accept Null Hypothesis

**Table: 07**  
**Correlation Coefficient and Student's "t" Test for CCL**

Correlation between ROTA and	"r" Value	Computed Value	Table value ( $t_{0.05,8}$ ) two tail test	Decision	Interpretation
NWTDR	0.695	2.73	2.306	Reject Null Hypothesis	High Positive & Significant
NWFAR	0.734	3.05	2.306	Reject Null Hypothesis	High Positive & Significant
TDTAR	-(0.717)	-2.90	-2.306	Reject Null Hypothesis	High Negative & Significant
LDTDR	-(0.380)	-1.16	-2.306	Accept Null Hypothesis	Fairly Negative & Insignificant

#### Findings

1. From NWTDR we find that CCL has fluctuating but impressive picture of long term solvency and internal strength. This may be due to continuous profit making during the study period. However the trends of the ratio is showing fluctuating trend the performance of the company towards maintenance of net worth for every rupee of debt is satisfactory. During the study period CCL has improved NWTDR ratio from 0.41 to 1.01 which is nearly 2.5 times of the beginning (2006-07). However CCL ratio is lagging behind CIL (industry) and hence needed improvement in net worth in order to reduce financial risk.

2. From NWFAR we find that CCL has been able to finance its fixed assets and even a part of working capital from owners fund as all the ratios during the study period

is more than one. This is showing a satisfactory position during of the company with regard to long term solvency position. CCL has improved this ratio from 1.19 to 2.28, nearly two times in ten years period. However performance of CCL is below the industry average and hence it needed further improvement.

3. From TDTAR we find that CCL has improved this ratio during the study period and trying to be less dependent on debt capital. A decreasing trend of this ratio is showing improvement in the performance of CCL. On an average CCL has used total debt of Rs 0.55 per rupee of total asset against Rs 0.46 of CIL. This indicates performance of CCL is below the performance of the industry and it needed further improvement in future.

4. From LDTDR we find the proportion of long term debt to total debt for CCL has decreased over the study period. This indicates more inner strength of the company and decline of long term debt due to continuous profit making by the CCL over the year. Here the performance of the CCL is satisfactory over the period.

5. From the Pearson's Correlation Coefficient we find that for CCL, there is a high degree of positive correlation (0.695) exist between NWTDR and ROTA and NWFAR (0.734) and ROTA. This implies that improvement in Net Worth, NWTDR and NWFAR will improve profitability of the company (CCL).

On the other hand there is a high degree of negative correlation (-0.717) exist between TDTAR & ROTA and a low negative correlation (-0.384) exist between LDTDR & ROTA. This indicates further reduction is necessary in long term debt capital in order to improve the profitability of CCL.

Thus all the four capital structure ratios are effect on profitability of CCL.

6. From the industry analysis, we are find that though all the capital structure ratios of CCL improved substantially over the study period, they are still below the industry level. Only exception is the LDTDR for CCL which has better performance than CIL in last half of the study period. Thus the overall situation demands further improvement in net worth, long term debt management, total and fixed assets management and management of capital structure of CCL.

7. In the table 07, NWTDR and ROTA, NWFAR and ROTA, & TDTAR and ROTA. in all the three cases the test showing that there is significant correlation exist between capital structure ratio and profitability, except in case of LDTDR & ROTA, where the test is showing no significant correlation exist between proportion of long term debt to total debt and profitability of CCL.

## V. CONCLUSION

It is clear from the above study that the long term solvency position of CCL is satisfactory. It has positive net worth, positive capital employed, and decreasing trend of debt. The total debts are nearly covered by its net worth, fixed assets are nearly covered around more than two times by owners fund and total assets are more than total liabilities because of steady profit making. The long term debt to total debt ratio is better than industry average but it reveals conservative approach of CCL to take financial risk. Moreover CCL needs further improvement in capital structure as compare to industry in order to improve profitability and earning per share. Overall we can say that the company (CCL) in good long term position, especially in the last half of the study period and progressing towards stability.

### *Limitations of the Study*

1. This study is limited to ten years performance of from the year 2006-07 to 2015-16.
2. The study is based on only secondary data from published annual report of the companies.
3. Only selective ratios are used to assess the long term solvency and profitability of the companies. On the other hand ratios are an aid to analysis and interpretation but not the substitute for sound thinking.

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