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Working Capital Management Efficiency in Public Sector Enterprises: A Study of Central Coalfield Limited, Ranchi

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***Abstract* – Working Capital Management Efficiency in Public Sector Enterprises: A Study of CCL, an investigation, endeavours to study the efficiency of working capital management practice in two prominent public sector enterprises namely Central Coalfields Limited (CCL), Ranchi and to measure their short-term assets and liabilities towards the liquidity, profitability and efficiency. The management of working capital has a great part to play in public sector enterprises and to make the functioning of the public sector enterprises effective. The design for the investigation is a descriptive design in a quantitative manner for conducting this study. Secondary data were utilized and were procured from annual reports, financial statements and other publication of CCL, Central Coalfields Limited, for the span of some chosen years. Some financial tools and ratios namely, ratio analysis, working capital turnover ratio, current ratio, quick ratio, inventory turnover ratio and debtor turnover ratio were used to measure the efficiency of the working capital. Also, a comparative analysis has been made with both of the enterprise. The conclusion has been that the efficiency of working capital has impact the profitability and liquidity of the public sector enterprises and that the analysis shown by that the working capital efficiency of CCL varies as per their inventory management, receivable management and overall liquidity position. Therefore, it has shown that good management and controlling is of utmost importance. In the end, it is concluded that a proper working capital management would be beneficial to the financial strength and increase in profitability of the public sector enterprise. It is recommended that both enterprises be aware for better controlling for their inventory management, receivable management, cash management and consequently their working capital efficiency.**

***Keywords* - Working Capital Management, Public Sector Enterprises, Liquidity, Profitability, Ratio Analysis, CCL.**

I. INTRODUCTION

1. Background of the study

Overview of central Coalfield limited (CCL), Prior to 1991, Indian PSEs were functioning in a planned economy scenario wherein there was no necessity of efficiency in WCM. There was only concern regarding social considerations, resulting in problems related to high inventory levels and delayed receivables. With economic reforms in 1991, there is more competition and greater fiscal discipline, and hence, efficiency in WCM became imperative for liquidity and profitability. Central Coalfields Limited, which is a subsidiary company of Coal India Limited, has been experiencing problems pertaining to high inventory and delayed receivables. However, with time, the company has made efforts to improve the efficiency of its working capital.

Though often ignored, how money moves day-to-day shapes how well government Companies function. At Central Coalfields Limited in Ranchi, managing short term money and payments shows more than just numbers – it shows long standing patterns common across government-owned system. Operating within mining make things more difficult, slowing money flow. Efficiency here depends more on timing than rule – when supplies arrive, when payments are received.

Each stage, from extraction to delivery, affect cash availability. Delays pile up not by accident but through old system, fixed staff structure, long customer payment terms – put pressure on resources. Even small problems spread further. The firm adapts, though slowly, adjusts stock without major shifts.

Steady Cash flow matters most – not growth targets, not scale. What works is quiet correction: making small changes in credit rules, watching money to be received closely. Behind every decision sits an old thinking – one built for control, not speed.

2. Statement of the Problem

Working Capital Management (WCM) has a vital to play in influencing the liquidity, Productivity, and Income generation of the organization. For Public Sector Enterprises (PSEs), especially in the industry that involves large financial investment like that of Coal Mining sector, there is often a problem in managing their current assets and current liabilities. Inefficient management of stock, trade receivable, fund, and accounts payable can create many problems for the organizations in terms of performance and long- term viability.

For Central Coalfields Limited (CCL), which is a part of Coal India Limited, working in such a dynamic business environment that includes extensive Operational, inventory needs, and long credit periods, Various

initiatives have been implemented from time to time to enhance financial administration practices in the organization. However, there are still several challenges continue influencing the efficiency of working capital management of CCL.

The problem that is to be explored in this paper relates to the issue as to how far CCL has been able to manage administer its working capital efficiently and how this efficiency has been contributing the company in terms of its liquidity and operational efficiency.

3. Significance of the study

Significance of the study is reflected in its efforts to assess the effectiveness of working capital management (WCM) practiced in Central Coalfields Limited (CCL), Ranchi, which is a leading public sector enterprise in the coal mining industry. Effective working capital management is a key element of any successful business, since it ensures adequate levels of liquidity, efficient functioning of an organization's day-to-day operations and ultimately, improved performance. In view of high expenses on inventories, receivables and daily transactions typical of coal mining, WCM takes an especially significant role.

The study results might prove beneficial for CCL management in making strategic decisions aimed at improving their working capital practices. The gathered information might actually as a reference for taking actions to further strengthen business processes and economic stability of the company. Apart from that, the study may be valuable for other enterprises, particularly for the government administration dealing with public sector enterprises. It might support to the formulation of improved financial policies.

4. Scope and Limitations

In the present research, the primary focus of the study would be on analyzing the performance of Working Capital Management (WCM) in Central Coalfields Limited (CCL), Ranchi, which is a Public Sector enterprise conducting operating in the coal mining industry. It can be said that the efficiency of management of inventory, cash, accounts receivable, and current liabilities shall be analyzed to identify the outcome of the same on the productivity and productivity of the operations conducted by the company.

For the above purpose, the existing data related to various financial ratios and WCM measures will be used.

The approach will involve the analysis of the financial reports and financial statements of the company for five continuous financial years ranging from 2019-20 to 2023-24. However, the scope of the study will only include the above-mentioned company and does not apply to its subsidiaries of Coal India Limited or other public sector enterprises.

To be specific, the present study focuses mainly on the financial perspective of working capital management in the organization. Also, the impact of the same on the financial efficiency, liquidity, and activities of the business will be studied further in the research.

II. LITERATURE REVIEWS

Bhattacharya (1977) performed a research work in 1977 on how government organizations in India control their short-term financial resources. current financial resources were considered as the foundation of business enterprises like Central Coalfields Limited, since it helps routine business activities and regular operational functioning. He suggested that public enterprises should implement systematic stock management techniques, continuously monitor their financial position and economic condition, and develop proper cash planning strategies.

Ghosh and Maji, 2004 – He did research in 2004. They examined how Indian Industries handle their short-term funds. They wanted to see if using working capital Effectively was connected to earnings profits. This study is significant for Central Coalfields Limited. Central Coalfields Limited is a mining Company and mining companies need to manage their stock and customers payments to function properly. Managing working capital well helps mining companies like Central Coalfields Limited avoid delays and make money. The study by Ghosh and Maji shows that it is high necessary for companies, like Central Coalfields Limited to maintain funds to meet expenses.

Jain and Yadav (2007) researchers performed a study on how Indian government organizations manage their short-term financial resources. They analyze how these organizations control their short-term resources and short-term obligations and how this influences their cash position and earning capacity. The study utilized financial information from 137 public sector enterprises a period of thirteen years. The research work recommended that regular supervision of short-term resources and short-term obligations can enhance the performance and earning capacity of public enterprises.

Mishra 1975, He did research in 1975. Mishra examined the problems of handling funds that companies use to run their business activities in some government organizations in India. The study analyzed six public sector companies from 1960-61 to 1967-68. He used some Techniques to see how well these companies were handling finances. The study also found that it took a time for the companies to receive payments from their customers. So, the study

shows that mining companies should handle finances properly well. Mishra study is significant for companies like Central Coalfields Limited.

Goel (1997) in his research attempted an examination, "Management of Finance in Public Enterprises". He has evaluated that modern industries ought to improve their Earnings with the option to procure benefits. Benefits ought to be wisely used for Making payment of profit to investors and arranging stores for future development &Extension.

Mehta and Reddy (2018) Effective administration of debtors and inventories contributes to Improved profit generation of public sector firms. It was highlighted that an ideal balance of short-term solvency and profitability should be sustained. The limitation with this study is that there was no sector-oriented approach.

Kulkarni and Deshmukh (2019), Short-term financing methods used by companies in the public sector were studied. It was indicated that public sector companies rely on bank loans and government funding to fulfill their immediate needs. The research revealed that weak Control of accounts payable would make it necessary for the company to use external sources of finance and hence lead to higher finance costs.

Minyoso & Otuya (2023) Identified inefficiencies in asset control, delay in payment, and shortage of transparency as causes restricting effective working capital management in the public sector. These authors suggested strong management and financial planning methods.

Singh and Yadav (2021) Investigated the challenges in managing working capital faced by Public-sector entities. They found that some of the major contributors of poor working capital Management are government dependence, lack of accountability and ineffective use of Resources. The authors said that a performance-based system and more transparency could be the answer to the problems mentioned. But the role of technology was not covered in this paper.

Rafuse (1996) while carrying out study on "working capital management: An urgent Need To refocus Management" stressed on slow disbursement of payments. It was Noticed in the Study that there was healthy relationship between the customers and the Suppliers.

Filbeck and Krueger (2005) – He performed a contrast analysis across different industries where he shows how the efficiency of working capital changes over time following to wider economic shifts. He elaborated that the performance of working capital is influenced by macroeconomic factors like inflation, changes in interest rates, GDP growth etc. A core observation is that the productive management of capital and stock prices are correlated. A firm who sustains ideal liquidity levels has been rewarded by the market. At length he recommended that because external environment is un controllable then firm must try to actively alter its inventory, credit, and payables policies so that it can counter the macroeconomic environment which will be beneficial in protecting shareholder value.

Meszek and Polewski (2006) – They explored the different shades of working capital formation in construction sector. He observed that traditional financial ratios frequently default in storing the industry's inherent unpredictability. They noticed that in construction firms since the lifecycles of the project is long and cash flows are incalculable due to which firm face the challenge of unique liquidity. This necessitates the requirement that the firm should shift its retrospective accounting to a bold controlling methodology. They prescribed a more integrated system of operational factors like project climax and supply chain logistics along with the requirement of market. Following this they suggested that the firm is able to achieve revolutionized level of compound working capital management.

Chowdhury and Amin (2007) – They supervise a deep observation on working capital management practices in pharmaceutical companies of Dhaka. They highlighted the notable insufficiency in their way of handling short-term financial resources. They undervalued the importance of managing liquidity strategically and gives more importance to sales or production. Such practices lead to bigger issues like they may face the problem of inefficient cash conversion cycles, inappropriate inventory management and unacceptable receivables. These practices tied the flow of capital which can be used in research and development. Their Observation states that such type of companies should move from traditional approach of accounting to more systematic approaches for handling their current assets and liabilities.

Jain and Yadav (2007) – They investigated all-encompassing assessment of working capital management in Indian Public sector enterprise (PSEs). Their Observation shows that many organizations depend on very long working capital cycle that indicates the trapped capital of these organizations in operational activities. Such type of incompetence over and over build the problem of slow turnover of inventory or delayed collection from debtors which will automatically lead to insufficiency of liquidity and strain the overall financial health of these state-owned firms. They suggest that such type of long cycles uplift the cost of capital and decrease profitability. Therefore, they recommended that Indian PSEs should adopt more rigorous controls and strategic

processes so that the operating cycle period can be shortened.

Ghosh (2007) – He investigated a 9-year long examination on working capital management in Indian cement industry. In this he specifically covered the relationship between liquidity management and profitability. To conduct his examination, he took the ratio analysis tool where he assessed their effective utilization of current assets to generate earnings. His observation core discovery initiated a positive relationship between turnover of capital and financial performance where significant point is that a large turnover shows that there will be high profit margin. Thus, it indicates that in the cement sector the pace of cycling of working capital in production and sales phases is a pivot determinant in the success.

Dutta (2000) in his research investigated on "Working Capital Management of Horticulture Industry in Himachal Pradesh: A Case Study", and the study revealed that one of the major causes for the declining of working capital is due to holding of huge amount of inventory. He also revealed that there is no direct correlation between Gross working capital and sales.

Kaur and Singh (2013) in their research titled "managing affective and profit through working capital", the tried to exam in the relationship between the management of the working capital and the profit ability of the company. They are research focused on a large in depth analysis of. BSE 200 companies. The research was based on a large sample of BSE 2000 over a long time period from 2000 to 2010. In their conclusion of the finding, they stated that the profit level of the form directly linked to its capital with suggest that the profit ability of the form organization is influence significantly by the proper and efficient handling of their working capital.

Joseph in 2014, conducted an extensive study titled "impact of Working Capital management on firms profit ability and liquidity", an empirical study of Ashok Leyland Limited" this study analyzed the interrelation between short term financial management and corporate performance. In an automobile industry, a leading player was kept on Focus the aim of the research was to access how current assets and liabilities management influences financial health of an organization. The study examined the balance between maintaining sufficient liquidity to meets operations and maximizing profit ability. Nevertheless, he experimented finding shows companies profit and liquidity position we are not the ideal level during its study indicating need for more solid working capital strategies in order to enhance forms progress.

Ramudu and Rao (2007), in their study titled "How Efficient is cash management? An investigation into India commercial vehicle industry, indicates a proper assessment of the liquidity framework within one of the India's most intensive capital sector. After the evolution of cash holding among selected organization, they highlighted lack of synchronization between actual cash maintenance and traditional financial drivers.

Manjhi and Kulkarni (2012) conducted empirical study entitled "Working capital structure and liquidity analysis: An empirical Research of Gujarat Textiles Manufacturing Industries" was aimed at investigating the liquidity conditions of different industrial sectors in the textile manufacturing industry. They noted attempted to measure the effectiveness of working capital management based on an assessment of short-term performance of selected manufacturing enterprises

Pratap (2023) evaluated that working capital management is the changes that have taken place in the short-term fund management, has looked back to many years of studies Covering different industries and countries economies, one thing is obvious – this area shapes core financial decisions. The study also stronger management over cash connected with difficult market situations stand it showed companies that are good at in working capital handling achieve better results during challenging.

MinyosO & Otuya (2023) refers that Working Capital Management in Public Sector Enterprises, they focused on universities. When receivables are delayed for a long time, when inventory remains unused, or when state funds arrive late. These problems affect more in government instructions where strict rules delay fast solutions. Without this, even good plans failed. What held things together was clear structure behind every expense made.

Kayani (2019) says that Impact of Working Capital Management on Earnings, reviewing 187 earlier studies, they studied how managing every fund relates to business results. Their study shows companies make better earnings when they handle inventory, receivables, and supplier payments properly. This reduces costs and keeps smooth money flow. Very few studies studied people's decisions behind the data, leaving opportunity for further study into leadership approach and employee coordination in upcoming studies.

Singh & Kumar (2014) evaluates that Challenges and Research Gaps in Public Sector WCM, most work on managing company funds relies heavily on numbers, Singh and Kumar pointed out back in 2014Athough data-based results explain how cash management impacts profit they do not show what really influences do not show what really influences managers' decisions. Therefore, deeper studies using interviews and case can provide more insights than only financial data.

Iqbal (2022) refers that Cash Conversion Cycle and Liquidity Management, studying government organizations, he studied how managing cash impacts financial stability. However, problems arise when payments are delayed or budgeting is not accurate. Rather than following traditional methods moving to modern tools for monitoring cash flow improve results. More accurate forecasting of income and expenses also helps maintain balance internally.

Khatik and Singh (2015) did a case study in 2015. The study is about cash management in public companies. The aim of study was to focus on the management of Cash in Hindalco industries. Good management of Cash help a company in smooth running. The cash turnover ratio is very good while the other year. The Ratio was not very efficient. The findings of the studies that the cash management of the Hindalco is inconsistent.

Dilli (2016) study on working capital management in transmission corporation Ltd of Andhra Pradesh was done in 2016 by him. The aim of him is for conducting the study was to check how efficiently and effectively a company uses its working capital. To check the efficiency of the company's working capital, he used different types of accounting ratios. The findings of the studies that most of the company's working capital was stuck with debtors. The study done by him shows that the financial ratios had great impact on company's performance.

Thimmaiah (2016) In India Thimmaiah runs a study on coal India Limited to find out how working capital of the company affects the liquidity and profitability of the company. His study is done for the purpose of knowing that if managing working capital in efficient way can help Coal India Limited or not. We see that there is a negative and weak connections between the Liquidity and Profitability of the company. It shows that when the Liquidity of the company goes up, Profitability of the company tended down and vice-versa

Simon (2017) In Nigeria a study is done upon companies in 2017 to find out how working capital efficiency affects the company either positively or negatively. The findings of the study of Simon that if a company have enough working capital, then the company is able to pay its short-term obligation smoothly, which is helpful for safe run of the company. On the other hand, he found that too little working capital adversely affects the functionality of the firm. The result of his study is that both too much working capital or too less working capital negatively affect the business.

Prasad et al (2018) research team in 2018, did a study on various Pharma companies of India in 2018 to know about how good Pharma companies of India uses their working capital. The performance of companies neither very efficient nor terrible. The overall result of the study was average that shows some industries are doing good while other not Although they are not the very good performance but also not in financial danger.

III. RESEARCH GAP

Most of the available literature is concerned with working capital management in relation to profitability across various industries and public sector enterprises. However, only a few researches are available specifically in Central Coalfields Limited with latest financial data. Working capital policies of the organization are studied in a generalized manner without its effect on the overall financial position, liquidity and efficiency of the working of the company and changing economic conditions along with latest trends of financial nature have not been taken into account. Therefore, a latest study is expected to give a broader view of the working capital policies and financial statements of CCL.

Research Questions

- Q1. Does working capital management affect significantly on the Central Coalfields Limited profitability?
- Q2. What is working capital management's impact on the Central Coalfields Limited profitability?
- Q3. How do the changes of the working capital's components effect on the Central Coalfields Limited profitability?
- Q4. Did working capital management contributes positively on the Central Coalfields Limited financial performance over study period?
- Q5. To what degree does working capital management influence the Central Coalfields Limited profitability?

Research Objective

- To analyse and evaluate the performance of working Capital management of CCL.
- To find and evaluate the performance of inventory and cash management of CCL.
- To examine the impact of working Capital Management on profitability of CCL.

Hypothesis of Study

- H_0 (Null Hypothesis): Working Capital Management has no significant impact on profitability of the CCL.
- H_1 (Alternative Hypothesis): Working Capital Management has significant impact on the profitability of the CCL

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IV. RESEARCH METHODOLOGY

Introduction to Research methodology
This study aims to analyze working capital management and its relationship to the financial performance of a government owned coal mining company. The secondary data collected through published annual reports for the period of 2021-2025 are utilized for this study, the analysis regarding managing of short-term assets and liabilities of the firm is determined. Statistical methods like correlation and ANOVA are applied to test research objective and hypothesis.

Research Design
This research employed two type of research designs which are descriptive and analytical/exploratory research designs in examining the working capital management in relation to the firm's financial performance. The descriptive design would assist to study the financial position of the company, the cash condition, current assets and current liabilities of the company from company's annual reports. While the analytical research design is utilized to examine the relations between components of working capital and profitability through techniques like correlation and ANOVA.

The Methodology to this research study
The research design for this study would be quantitative because it is based on numeric and monetary data extracted from financial statements, company's annual report from 2021 to 2025. It would involve examining working capital components: current assets, current liabilities, inventory, receivables, cash, profitability and it will be tested with financial and statistical tools to determine working capital management efficiency. Financial tools would be implemented together with statistical tools like correlation analysis, and ANOVA by applying SPSS.

Source of Data
Secondary data have been collected from Company Records, Annual Reports, Govt. Publications, Journals, Books, Internet/ Websites and on-line.

Data Analysis Tools- The analysis of secondary data, derived from annual reports and financial statement of 2021-2025 was carried out using SPSS software.

Regression Analysis: To investigate the relationship between Working Capital Management (WCM) and Profitability (P), Simple Linear Regression was employed.

Regression Equation: P = -0.686 + 0.259(WCM)

Where, WCM = independent variable and P = dependent variable.
From the equation above, it is deduced that for every 1 unit increase in Working Capital Management (WCM), profitability increased by 0.259 units.

Evaluation of the model
SSE = 0.004 (this error was significantly very small)
R reflects the extent to which the Working Capital Management explains the Profitability.
Important Assumptions
Linear relationship among variables.
Independent observations.
Normal distribution errors.
Constant variance of errors.

SPSS software: -This program was utilized in order to do regression, correlation, and analysis of variances which gives the research accurate and reliable results.

V. DATA ANALYSIS

Variables That Satisfy Hypothesis
Dependent Variable – Profitability
In this to support the variable, the main dimensions are Net Profit Ratio (NPR), Return on Assets (ROA), Return on Capital Employed (ROCE), and Operating Capital Ratio (OCR).

Independent Variable – Working Capital Management (WCM)

In this to support the variable the main dimensions are Current Ratio (CR), Quick Ratio (QR), Inventory Turnover Ratio (ITR), Debtors Turnover Ratio (DTR), and Working Capital Turnover Ratio (WCTR).

The calculations of the ratios are calculated below in the table which satisfy our hypothesis:

Year
- Current Assets
- Current Liabilities
- Working Capital

(4 = 2-3) CURRENT RATIO
(5 = 2÷3)

2021-2022	8977.75	6540.39	2437.36	1.37
2022-2023	12043.06	9172.28	2870.78	1.31
2023-2024	9551.89	6657.10	2894.79	1.43
2024-2025	9724.75	6787.59	2937.16	1.43

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Table 1: Current Ratio (₹ in Crore)

Year (1)	Current Assets (2)	Current Liabilities (3)	Working Capital (4 = 2-3)	Current Ratio (5 = 2÷3)
2021-2022	8977.75	6540.39	2437.36	1.37
2022-2023	12043.06	9172.28	2870.78	1.31
2023-2024	9551.89	6657.10	2894.79	1.43
2024-2025	9724.75	6787.59	2937.16	1.43

The table highlights the link between liquid resources and short-term accountability from 2021 to 2025. A significant change is seen in the financial year 2022-2023, where a peak in current assets escalated to ₹12,043.06 crore and current liabilities jumped to ₹9,172.28 crore; regardless of this variation, CCL maintained a positive Working Capital. A notable outcome is the balanced growth in Net Working Capital, which slowly mounted from ₹2,437.36 crore in 2021-2022 to ₹2,937.16 crore in 2024-2025, showing CCL is efficient in controlling its safety margin to maintain financial health. The Current Ratio dropped slightly to 1.31 in 2022-2023 as the company expanded its area, resulting in a slight growth in debt as compared to assets, but recovered very well in the coming years to around 1.43, where a consistency over 1.3 indicates a better liquidity position against short-term market instability.

Table 2: Inventory Turnover Ratio and Cash Ratio (₹ In Crore)

Year	Inventory (2)	Cost Of Goods Sold (3)	Inventory Turnover Ratio (4 = 3÷2)	Cash At Bank (5)	Cash Ratio (6)
2021-2022	1031.34	10,257.40	12.00	1,413.04	0.317
2022-2023	1144.30	10,625.17	12.75	2,533.87	0.367
2023-2024	1316.97	10,565.10	10.66	2,038.48	0.367
2024-2025	1809.30	10,056.68	8.12	1,124.93	0.329

So here, the financial performance of CCL, FY 2021-22 to FY 2024-25 reveals an expansion in the inventory with fluctuating liquidity levels. Inventory value rose from ₹1,031.34 crore to ₹1,809.30 crore, the inventory turnover peaked at 12.75 n FY 2022-23. Cost of good is stable here, average is approximately ₹10,376 crore annually. Cash at bank also reached a high of ₹2,533.87 cr. In FY 2022-23, but also declined to o ₹1,124.93 crore by FY 2024-25. Cash ratio was stable all along here, during the middle years adjusting to 0.329 in the last fiscal year.

Table 3: Roa, Roce & Net Profit Ratio (NPR) (₹ In Crore)

Year	Net Profit	Total Assets	Return On Assets (Roa)	Return On Capital Employed (	Net Profit Ratio (Npr)
2021-2022	1698.94	20,817.10	8.16 %	74.10%	12.60 %
2022-2023	3398.71	25,992.86	13.07 %	162.83 %	16.83 %
2023-2024	3361.05	26,783.91	12.54 %	163.39 %	22.10 %
2024-2025	4039.53	31,191.49	12.95 %	184.49 %	21.23 %

Based on the financial data provided, the table outlines the performance of an entity over a four-year period from 2021 to 2025, highlighting a strong upward trend in core profitability. Net Profit more than doubled from 1,698.94 in the first year to 4,039.53 in the final year. This growth is reflected in the Net Profit Ratio as well with a steep rise from 12.60% to a high of 22.10% in 2023-2024 before a slight stabilization at 21.23%. Total assets increased consistently from 20,817.10 to 31,191.49, which represents a substantial increase in the company's resource base. The ROA increased sharply from 8.16% in the first year to 13.07% in the second year and remained stable at around 12-13%. Finally, the Return on Capital Employed (ROCE) shows the climbing from 74.10% to 184.49% over the period, which reflects a massive increase in the returns generated relative to the working capital utilized.

Hypothesis Testing

Table 4: Variables Entered/Removeda

Variables Entered/Removed[a]			
Method	Variables Entered	Variables Removed	Method
1	WCM[b]	.	Enter

The Variables Entered/Removed table is the backbone of the regression analysis. The table's main objective is to give a detailed explanation of the variables under analysis and the exact mathematical procedure used in their computation. It is ensuring that the independent variable, WCM, has been correctly entered into the analysis without any data conflicts that would result in its automatic

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exclusion. In essence, this table records the input phase of the analysis and proves that the relationship will be interpreting between the predictor and the dependent variable (P) is derived from the complete set of data submitted.

Table 5: ANOVAa

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.058	1	.058	32.908	.029[b]
	Residual	.004	2	.002		
	Total	.062	3			
a. Dependent Variable: P						
b. Predictors: (Constant), WCM						

According to the results presented In the ANOVA table, the regression of WCM on Profitability produces the Sum of Squares for regression as 0.058 and Sum of Squares Residual as 0.004. In addition, the Mean Square error is very small (0.'02) relative to the Regression Mean Square (0.058). The computed F-statistic is 32.908, which is statistically significant at the 0.029 significance level. The most important value for your research is the Sig. (p-value) which is .029. Since 0.029 Is less than 0.05, we can confidently reject the null hypothesis. Therefore, it is concluded that the Working Capital Management is a highly significant determinant of Profitability in the public sector units under consideration.

Table 6

Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.686	.258		-2.664	.117
	WCM	.259	.045	.971	5.737	.029
a. Dependent Variable: P						

The regression coefficients analysis confirms a significant, direct positive association between Working Capital Management (WCM) and Profitability (P) at CCL Ranchi, leading to the rejection of the Null Hypothesis (H0) and acceptance of the Alternative Hypothesis (H1). The unstandardized coefficient (B = 0.259) establishes the regression equation $P = -0.686 + 0.259(WCM) + \varepsilon$ indicating that a negative intercept implies an initial loss without working capital management, while every unit increment in WCM efficiency yields a 0.259 increase in profitability. Furthermore, the outstanding standardized Beta of 0.971 demonstrates highly important explanatory power, and the statistical validity is strongly supported by a high t-statistic of 5.737 and a significant p-value of 0.029 (less than 0.05). Ultimately, these preliminary regression analysis results reveal that the profitability of CCL Ranchi is significantly impacted by the efficiency of the working capital cycle process.

Year	Current ratio (CR)	Working Capital Turnover Ratio (WCTR)
2021-22	1.37	5.53
2022-23	1.31	5.71
2023-24	1.43	5.72
2024-25	1.43	5.87

Objective Achieved

- 1.To analyse and evaluate the performance of working capital management of working management of CCL.
- Healthy liquidity: - from the table above, we can say that Current Ratio stayed above 1.3, raised to 1.43 in past 2 years. It shows CCL has enough current asset to fulfill obligation.

Increased efficiency: -The working capital turnover ratio improved, it shows CCL generates more sales per unit of working capital.

In overall, we say CCL maintains strong liquidity while using its working capital.

To find and evaluate the performance of inventory and cash management of CCL.

Year	Inventory turnover ratio (ITR)	Cash Ratio (CR)
2021-22	11.63	0.124
2022-23	15.06	0.185
2023-24	13.46	0.118
2024-25	11.93	0.165

Fluctuation in inventory management: -From the table we see inventory turnover ratio reached at 15.06%in 2022-23, it shows fast stock movement. While in 2024-25 it dropped to 11.93, it shows slower sales and more capital stuck in inventory.

Cash position – The cash position of CCL is decreased. In 2024-25 ratio is 0.165 it shows company only converts 16.5% of short- term liabilities into cash.

Overall, In CCL there is high operational activities in 2023, while efficiency and cash safety dropped.

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VI. FINDINGS, CONCLUSION & RECOMMENDATION

Findings

- **Hypothesis Result:** Rejected Null (H_0). The Working Capital Management significantly impacts the profitability.
- **Model Validity (F-Value):** 32.908. It proves a highly systematic relationship, not a random fluke.
- **Significance (p-value):** 0.029. Well below the 0.05 threshold, confirming high model reliability.
- **Correlation (Beta):** 0.971. Indicates an exceptionally strong positive relationship.
- **Predictive Value (B):** 0.259. Every 1-unit optimization in WCM increases profit margins by 0.259 units.

Conclusion

- **Financial health:** ccl shows strong structural stability and asset growth Over the 4-year study period.
- **Liquidity buffer:** current ratio safely averages 1.43, which ensures the short-term Obligations are fully covered.
- **Profit efficiency:** the return on capital employed (ROCE) shows high Growth, surging from 74.10% to 184.49%.
- **Core bottleneck:** inventory turnover ratio dropped from 15.06 to 11.93.
- Capital is getting locked up in physical stock due to mining logistics lags.
- **Strategic takeaway:** The WCM must be managed as a core profit driver, not a Routine administrative task.

Suggestions

- **Optimize the Inventory Cycle-** There is a high correlation between WCM and Profitability, thus CCL needs to reduce the lead time of coal stocks to free cash.
- **Faster Collection:** Tighten credit policy to accelerate collection from power plants and industrial customers.
- **Focus on the Operating Cycle –** Shorten the time from cash spent on mining to cash received from sales.
- **Cost Reduction in WCM -** Reduce the administrative overheads in finance department to reduce the Standard Error in the finance operations.
- **Internal Benchmarking –** Compare the WCM efficiency of different mining areas under CCL using the given regression model.
- **Reduce residual risk –** Examine the 0.004 residual variance to uncover hidden drivers of profitability.

Future Scope of the Study

The whole study is beyond the simple financial audit. The study provides a scalable mathematical framework (Regression model) for other subsidiaries of Coal India Limited. This presents an opportunity for comparative studies of different public sector enterprises (PSEs) to ascertain whether a Beta of 0.971 is the industry standard in mining. Future researchers can extend this study to incorporate qualitative factors such as Management Quality or Technological Adoption as additional independent variables.

The scope of future upcoming studies may also examine the influence of outside conditions including inflation, changes in market conditions, official policies, ecological regulations, and international financial environment on working capital requirements and earning performance of coal sector coal industry organizations.

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