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## **A Study on Working Capital Management and Profitability of Steel Industries in India**

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### ABSTRACT

Managing working capital is important to the financial health of a business of any size. The amounts invested in working capital are usually high relative to the total assets employed and therefore must be used efficiently. The management of working capital affects the liquidity and profitability of the company and, therefore, its net worth. The objective of working capital management is, therefore, to maintain a balance between liquidity and profitability in day-to-day management. The main objective of this article is to examine the impact of working capital on the profitability of Indian companies. In this study, we selected a sample of 5 Indian companies listed on the National Stock Exchange (NSE) over a 5-year period from 2017-2021. The results of our study differ significantly from the various international studies that have been conducted in different markets. This study was based on secondary data. The paper used statistical tools like correlation, and regression model. This study complements the existing literature by examining the effects of working capital management on profitability in the context of an emerging capital market such as India. We find that of these working capital ratios vary significantly across industries over time.

**KEYWORDS:** Efficiency in the management of working capital, liquidity, current assets, current liabilities, descriptive analysis, Profitability, Correlation, Regression.

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### 1. INTRODUCTION

Working capital management is an important part of corporate financial management, as it directly affects the profitability of companies. Working capital management includes funds held in current assets (CA) that, in the normal course of business, can be converted to cash in a short period of time without loss of value and without disrupting the organization. Current Liabilities (CL) are those that must be settled in a short period of time in the course of normal business. The way working capital is managed has a significant impact on business profitability. An important part of managing working capital is maintaining liquidity in the day-to-day business to ensure smooth processes and meet obligations. This is not an easy task, as managers must ensure that business operations are efficient and profitable. During this process, there is the potential for current assets and Current Liabilities to become mismatched, which could affect the growth and profitability of the business. On the other hand, companies with less working capital may experience a lack of funds and have a difficult time keeping the business running smoothly. Efficient working capital management is a fundamental part of the overall business strategy to create shareholder value. As a result, companies seek to maintain optimal levels of working capital that maximize its value. More specifically, investing in working capital involves a trade-off between profitability and risk, as this affects the value of the company. Business decisions that tend to increase profitability led to increased risk and, conversely, decisions that focus on reducing risk led to a decrease in potential profitability. This article examines the relationship between the components of capital in work and company profitability for a sample of 5 companies listed on the National Stock Exchange (NSE) in India for a period of 5 years from 2017-2021.

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### 2. REVIEW OF THE LITERATURE

Awalacki Manjunath (2020) has studied the efficiency of working capital management an efficiency index is constructed and compared with firm's profitability, and Return on Current Assets is used as proxy for measuring the firms' Profitability. The paper used statistical tools like correlation, and regression model, with diagnostic tests for justification of accuracy of the model. The study highlights that selected firms doesn't have significant relationship with earnings of the firms. There is sufficient evidence in existing financial literature that presents the significance of working capital management. Results of empirical analysis show that there is statistical evidence of a strong relationship between a firm's profitability and working capital management efficiency. A firm that faces lesser competition normally focuses on minimizing receivables to increase future possibilities of cash flow. Rehman (2006) has studied the impact of different variables of working capital management including Average collection period, inventory turnover in days, Average payment period, and cash conversion cycle on net operating profitability of firm's and concluding by indicating that there was a strong negative relationship between these working capital financial ratios and profitability of firms. Dr. Muhammad Azam (2011) has done the study to investigate the impact of working capital Management on firms' performance. The results are obtained by using Canonical Correlation

Analysis for identifying the relationship between working capital management and firms' performance. The findings of his study show that working capital management has significant impact on firms' performance and it is concluded that managers can increase value of shareholders and returns on assets by reducing their inventory size, cash conversion cycle and net trading cycle. Chowdhury and Amin (2007) have done the study to measure the impact of overall working capital policies on the profitability firms. The primary and secondary data was used for the purpose of study. The results of their study indicated that for the overall performance of the industry, working capital management played a vital role and there existed a positive relationship between current assets management and performance of firms. Sumaira Tufail (2012) has mentioned in her study that Working capital can be considered as source of existence for a financial body and management of working capital is regarded as one of the most essential part of business management. Results of her study shows that aggressiveness of working capital management policies is negatively associated with profitability. Moreover, liquidity and size of the firm have positive relation profitability whereas debt to equity ratio is negatively correlation with profitability. Singh and Pandey (2008) have made an attempt to study the working capital components and the impact of WCM on profitability Hindalco industries limited for period from 1990 to 2007. Results of the study have shown that current ratio, liquid ratio, receivable turnover ratio and working capital to total assets ratio have a statistically significant impact on the profitability of Hindalco Industries limited. Singh has found that the size of inventory directly effects on working capital management. He has suggested that inventory is the major component of working capital and needs careful attention. Singh and Pandey (2008) have suggested that for the successful working of any business organisation, fixed and current assets play vital roles, and the management of working capital is essential as it has a direct impact of profitability and liquidity. Afza and Nazir (2009) have made an attempt to investigate the traditional relationship between working capital management policies and a firm's profitability for a sample of 204 non-financial firms listed on Karachi Stock Exchange (KSE) for the period 1998-2005. The study reveals some significant differences among various working capital needs and financial policies across different industries. Moreover, regression result has also found a negative relationship between the profitability of firms and degree of aggressiveness of working capital investment and working capital financial policies. Ramachandran and Janakiraman (2009) have found a negative relationship between earnings before interest and tax (EBIT) and the CCC. The study reveals that operational EBIT dictates how to manage the working capital of a firm. Further, it is found that lower gross EBIT is associated with an increase in the account payable days. Thus, the study concludes by saying that less profitable firms wait longer to pay their bills, taking advantage of credit period granted by supplier. The positive relationship between average receivable days and a firm's EBIT suggests that less profitable firms pursue a decrease of their account receivable days to reduce their cash back in the CCC. Nazir and Afza (2009) have used internal and external factors to explore the determinants of working capital requirement of a firm. Internal factors where operating cycle, operating cash flow, leverage, size, ROA, Tobin's q and growth with industry dummy and level of economic activity has external macroeconomics factors. Uyar (2009) has examined industry benchmarks for CCC in case of merchandising and manufacturing companies and has found that the merchandising industry has a shorter CCC than manufacturing industries. The study further shows significant negative correlation between the length of CCC and the profitability. Amarjit Gill, Nahum Biger, Neil Mathur (2010), in their paper, seek to extend Lazaridis and Tryfonidis' findings regarding the relationship between WCM and profitability.

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### 3. OBJECTIVES

Following objectives are taken for the study.

1. The prime objective of the study is to identify the relationship between WCM and Profitability from 2017 to 2021
  2. To establish a relationship asset liquidity and relative finance liquidity in steel industry
  3. Minimization of cash conversion cycle
  4. Reduction in the amount invested in the current asset
2. The secondary objective of the study is to recognise the profitability.

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### 4. MATERIAL AND METHODS

This section is divided into five sub-sections. The first sub-section presents the scope/statement of the problem. The sub-second section discusses the period of the study. In the sub-third section, data sources are discussed. The sub-fourth section illustrates the reliability and validity whereas the last subsection highlights the types of statistical techniques were employed

#### 4.1. STATEMENT OF THE PROBLEM

The scope of the study is listed companies in India. one thousand six hundred forty-one companies are listed under National Stock Exchange (NSE). Hence out of which five companies were selected on a random basis. The period of the study was five years from 2017 to 2021 financial year. These companies include

**1.TATA STEEL 2.JSW STEEL 3.JINDAL STEEL 4.ELECTRO STEEL 5.STEEL AUTHORITY OF INDIA**

#### 4.2 Period of the Study

The period of the study was five years from 2017 to 2021 financial year

#### 4.3 DATA SOURCES

In order to meet the requirement of the study, data were collected from secondary sources mainly from financial report of the selected companies, which were available on screener.in and Topstockresearch.com.

#### 4.4 RELIABILITY AND VALIDITY

The secondary data for the study was extracted from the income statement and the balance sheet of the interested companies because they are quite accurate and reliable. Therefore, these data can be considered reliable for the study. In the necessary checks and cross-checks were carried out while the information and data from secondary sources were scanned.

#### 4.5 TYPES OF STATISTICAL TECHNIQUES

we analyse our data by employing correlation and Regression. Based on the regression model ICP; DCP and CCP are considered as the dependent variables whereas EBIT are the independent variables. The detail analysis is carried out with the help of this variables. A well-known statistical package of Microsoft Excel was used in order to analyse the data.

#### WORKING CAPITAL AND PROFITABILITY RATIO

Type of Ratios	Explanations	Calculation
The Inventory Conversion Period (ICP)	ICP is the time required to convert inventory into cash	inventory divided by average sales or cost of sales and multiplied by 365
Debtors' Collection Period (DCP)	In accounting the term Debtor Collection Period indicates the average time taken to collect trade debts	dividing the amount owed by trade debtors by the annual sales on credit and multiplying by 365 .
Creditors Conversion Period (CCP)	CCP is the length of time the firm is able to defer payments on various resource purchases	CCP=365/Creditors turnover ratio
ROA	It is based on the relationship between the sales and total assets of a firm.	Net sales * 100 Total Assets
Earnings before income and taxes (EBIT)	EBIT (earnings before interest and taxes) is a company's net income before income tax expense and interest expenses are deducted	Net Income + Interest + Taxes

### 5. RESEARCH METHODOLOGY

Based on related literature review, the research model is shown, describing how the working capital management and its impact on profitability in listed companies is formed on the basis of this study. The data which is collected are analysed and used as per the requirement of the analysis. The sample size for the study is five firms. The samples are chosen on convenience sampling method, and the data collected for 2015- 2019 period. The study used descriptive statistics, Mean, Standard Deviation, Minimum, Maximum, Correlation, regression.

### 6. FINDINGS

Findings explain model, relationship between working capital management and profitability and working capital management and its impact on profitability.

### 7. DATA ANALYSIS AND INTERPRETATION

Data analysis is the process of collecting, converting, cleaning, and modelling data to get the information you need. Results are shared, conclusions are suggested, and decision-making is supported. For data analysis, DCP, CCP, ICP and average EBIT were calculated and put in tabular form, which could be useful for a more detailed analysis and meet the research objectives

## 7.1 VARIABLES USED FOR STUDY

ICP = Inventory Conversion Period.

DCP = Debtors Conversion Period.

CCP=Creditors Conversion Period.

EBIT=Earnings before interest and taxes.

### 7.1.1 ICP:

Number of days inventories used as proxy for the inventory policy is an independent variable. It is calculated as (inventories x 365)/ cost of goods sold.

**Table:2**

ICP					
Year	Tata Steel	JSW Steel	Jindal Steel	ElectroSteel	Steel authority of India
2017	230	147	185	249	274
2018	224	118	191	219	199
2019	190	123	146	228	243
2020	178	130	207	278	370
2021	213	160	202	274	207

### 7.1.2 DCP:

Number of days accounts receivable used as proxy for the collection policy is an independent variable. It is calculated as (accounts receivable x 365)/sales.

**Table-3**

DCP					
Year	Tata Steel	JSW Steel	Jindal Steel	ElectroSteel	Steel authority of india
2017	38	27	29	81	24
2018	37	24	20	85	25
2019	27	31	24	82	25
2020	19	22	34	83	52
2021	22	21	21	81	38

### 7.1.3 CCP:

Number of days accounts payable used as proxy for the payment policy is an independent variable. It is calculated as (accounts payable x 365)/ cost of goods sold.

**Table-4**

CCP					
Year	Tata Steel	JSW Steel	Jindal Steel	ElectroSteel	Steel authority of india
2017	172	50	109	109	90
2018	161	65	110	121	87
2019	130	50	117	94	89
2020	123	77	181	120	97
2021	166	77	137	103	93

### 7.1.4 EBIT:

Earnings before interest and taxes (EBIT) is an indicator of a company's profitability. EBIT can be calculated as revenue minus expenses excluding tax and interest. EBIT is also referred to as operating earnings, operating profit, and profit before interest and taxes. EBIT= Net profits+Interest+Taxes, EBIT= Revenue - operating expenses.

**Table-5**

EBIT					
Year	Tata Steel	JSW Steel	Jindal Steel	ElectroSteel	Steel authority of india
2017	13236.27	12055.88	4498.75	360.82	485.3
2018	26831.5	11082	2128.88	232.35	2402.76
2019	23803.31	14731	1388.19	150.66	6726.72
2020	7301.74	6949	3750.31	298.25	6761.75
2021	21450.4	16007	10031.89	154.81	10022.8

**7.1.5 CCC:**

The cash conversion cycle used as a comprehensive measure of working capital management is another independent variable. It is calculated as (number of days accounts receivable + number of days inventory – number of days accounts payable).

**Table-6**

CCC					
Year	Tata Steel	JSW Steel	Jindal Steel	ElectroSteel	Steel authority of india
2017	96	125	106	220	209
2018	99	77	102	182	137
2019	87	104	53	217	179
2020	75	76	60	242	325
2021	69	103	85	252	152

**Table-7**

AVERAGE					
Year	ICP	DCP	CCP	EBIT	CCC
2017	217	39.8	106	6,127.40	151.2
2018	190.2	190.2	190.2	190.2	190.2
2019	186	186	186	186	186
2020	232.6	42	119.6	5012.21	155.6
2021	211.2	211.2	211.2	211.2	211.2

In this table calculated average on ICP, DCP, CCP, EBIT, CCC of years from 2015 to 2019 for calculation of Descriptive analysis, Regression analysis, and correlation analysis.

The above table shows us about the average of five selected firms for the period of five years that is from FY2017 to FY2021 from the above data further analysis is done

**DATA ANALYSIS AND INTERPRETATION**

Data Analysis: The process of assessing data using diagnostic and logical reasoning to examine each component of the data provided. This form of analysis is just one of the many steps that must complete when conducting a research experiment. Data from various sources is assembled, studied, and then analyzed to form some sort of outcome or conclusion. Statistical techniques: Arithmetic mean, standard deviation, coefficient of variation, coefficient of correlation, regression and student t-test.

**7.2 Descriptive Analysis:**

A descriptive data point may be an outline data point that quantitatively describes or summarizes options from a set of data, whereas descriptive statistics is that the method of victimization and analyzing those statistics. Some measures that are unremarkably wanted to describe a knowledge set are measures of central tendency and measures of variability or dispersion. Measures of central tendency embrace the mean, median and mode, whereas measures of variability embrace the quality deviation (or variance), the minimum most values of the variables, kurtosis and lop-sidedness. Use in applied math analysis: Descriptive statistics offer easy summaries concerning the observations that are created. Such summaries are also either quantitative, i.e. outline statistics, or visual, i.e. easy to know graphs. These summaries could either type the premise of the initial description of the info as a part of a lot of in depth applied math analysis, or they will be enough in and of themselves for a selected investigation. The employment of descriptive and outline statistics has an intensive history and, indeed, the easy tabulation of populations and of economic knowledge was the primary manner the subject of statistics appeared. a lot of recently, a set of account techniques has been developed underneath the heading of beta knowledge analysis. In the business world, descriptive statistics provides a helpful outline of the many varieties of knowledge. As an example, investors and brokers could use a historical account of come behavior by playacting empirical and analytical analysis on their investments so as to create higher finance selections within the future. The Descriptive data are calculated based on average of ICP, DCP, CCP, EBIT, CCC, for five years data, mean, median, mode, standard deviation, minimum, maximum, largest, smallest, & sample variance, that values are shown in the below.

**Table: 8 Descriptive Analysis:**

	2017	2018	2019	2020	2021
Mean	207.4	133.84	162.6	2345.403	178.84
Standard Error	8.64708	38.18363	20.88521008	1328.122	11.25067
Median	211.2	186	186	211.2	186
Mode	#N/A	#N/A	#N/A	#N/A	#N/A
Standard Deviation	19.33546	85.38119	46.70074946	2969.77	25.15727
Sample Variance	373.86	7289.948	2180.96	8819534	632.888
Kurtosis	-1.65726	-3.23324	-2.70719368	-2.86986	-1.786
Skewness	0.118383	-0.55052	-0.45899625	0.688203	0.053687
Range	46.6	171.4	105.2	5941.404	60
Minimum	186	39.8	106	186	151.2
Maximum	232.6	211.2	211.2	6127.404	211.2
Sum	1037	669.2	813	11727.01	894.2
Count	5	5	5	5	5
Largest(2)	217	190.2	190.2	5012.21	190.2
Smallest(2)	190.2	42	119.6	190.2	155.6

SUMMARY OUTPUT	
<i>Regression Statistics</i>	
Multiple R	0.890813329
R Square	0.793548387
Adjusted R Square	-2.619354839
Standard Error	1.016001016
Observations	4

**7.3 Regression Analysis:**

In applied mathematics modeling, multivariate analysis could be a set of applied mathematics processes for estimating the connection between dependent variables (or outcome or response variables) and one or a lot of freelance variables (or predictors or covariates or instructive variables or features). The foremost common kind of multivariate analysis is rectilinear regression, within which one finds the road (or a lot of advanced linear combination) that principally closely fits the information in line with a selected mathematical criterion. For specific mathematical reasons, this permits the investigator to estimate the conditional expectation (or population average value) of the variable quantity once the freelance variables withstand a given set of values. Less common sorts of regression use slightly completely different procedures to estimate various location parameters (e.g., quintile regression or necessary condition analysis) or estimate the conditional expectation across a broader assortment of non-linear models (e.g., statistic regression). In this below table the regression model is used for analysis of results for the profitability of the firms which is measured by EBIT, being dependent variable and independent variables are DCP, ICP, CCP, and CCC. Calculated by regression, multiple regressions, R square, Adjusted R square that is (65535). &also calculated ANOVA, coefficients values are shown in the below table. The model also points out that intercept of the equation is 507.8, 26.4, 209, 262.02, and 173.2 which shows that the earnings are expected to decrease by 74%.

ANOVA					
	Df	SS	MS	F	Significance F
Regression	5	3.96774	0.79355	1.92188	#NUM!
Residual	1	1.03226	1.03226		
Total	6	5			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1999.78341	10.43541036	191.6343816	0.003322	1867.18895	2132.378	1999.78341	1999.78341
217	0	0	65535	#NUM!	0	0	0	0
39.8	0.096622574	0.051565935	1.873767532	#NUM!	-0.55858475	0.75183	0.09662257	0.09662257
106	0	0	65535	#NUM!	0	0	0	0
6127.404	0.003223816	0.001663444	1.938036767	#NUM!	-0.01791225	0.02436	0.00322382	0.00322382
151.2	0	0	65535	#NUM!	0	0	0	0

## 8. Limitation of the study

- The study is restricted to a sample size of 5 companies in India and is confined to analysis of only 5 years data from 2017 to 2021.
- The effect of inflation has not been considered in the present study.
- The result of analysis is subject to same constraint are applicable to statistical tools.
- Since the report is exclusively made from data from secondary sources, direct observation is not possible; limitation of secondary data is applicable.
- There was no scope for gathering sufficient financial information since such information is, by default, confidential.
- The data collected for the study was historic in nature, so the suggestions might be irrelevant to certain situations.
- Analysis of this study is based on historical data, which has got its own limitations.
- Important financial explanatory variable is taken into account which are extracted from the most reliable and authentic data source for arriving at a logical conclusion.
- In India, companies adopt different years for closing their books of accounts. Some companies close their books of accounts on 31st March, some on 30th June, some on 30th September and some on 31st December as per the records shown in the database of BSE listed companies. So far as selection of dependent and independent variables are concerned, selected companies are made uniform as per their year-ending practices.

## 9. Conclusion

Working capital management (WCM) is that the practical space of finance that covers all current accounts of the firm. It involves the relationship between a firm's short-run assets and its short-run liabilities. A firm is needed to take care of a balance between liquidity and gain whereas conducting its every day operations. Liquidity may be a requirement condition to confirm that a firm is able to meet its short-run obligations and its continuing flow can even be secured from a profitable venture. The importance of money as AN indicator of continuous money health shouldn't be shocking visible of its crucial role at intervals the business organization. The goal of assets management is to confirm that a firm is in a position to continue its operations and that it's the flexibility to satisfy each maturing short-run debt and coming operational expenses. So, the management of working capital involves managing inventories, assets, accounts due and money. A firm will be terribly profitable if it interprets the money from operations at intervals constant operative cycle. If this can be impossible, the firm my got to borrow to support its continuing assets wants. Thus, the dual objectives of gain and liquidity must be well-synchronized. Investments in current assets square measure inevitable to confirm delivery of products or services to the final word customers, and correct management of constant fulfils the required impact on either gain or liquidity. If resources square measure blocked at totally different stages of the provision chain, this can prolong the money operative cycle. though this may increase profitability (due to extend in sales), it's going to additionally adversely have an effect on the gain if the prices pledged in assets exceed the benefits of holding a lot of inventory and/or granting a lot of trade credit to customers.

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