

Unraveling the Symphony: How the COVID-19 Pandemic Orchestrated Changes in Working Capital Management within the Steel Industry

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Abstract: The world health organisation (WHO) has discovered a novel coronavirus known as COVID-19, which has shattered human civilization and the global economy. The study is based on the impact of covid on working capital Management in selected public sector steel industry in India. The period of study taken for prior covid is 2016-2019 and 2019-2022. The study describes a favorable correlation, both before and after the advent of the COVID-19 pandemic ($r = 0.649$, $p < 0.001$). There is no significant difference between ($t=1.510$, $p < 0.001$). On average, the points prior to COVID exceeded those after COVID by 21844.69 points. (95% CI-8083.24, 51772.63)].

Keywords: Working Capital Management, Covid 19, Steel Industry, Paired Sample t test.

1. Introduction:

The management of a company's short-term funding needs is known as working capital management (WCM). This entails preserving the ideal balance of the working capital components receivables, inventories, and payables as well as effectively utilising the cash for ongoing business activities. The goal of working capital balance optimisation is to maximise revenues while minimising working capital needs.

Effective WCM raises companies' free cash flow, which enhances their growth potential and shareholder return. Given its cause, scope, and intensity, there is compelling evidence that the economic crisis brought on by the Coronavirus is entirely distinct from previous financial one (Ding et al. 2020).

The important thing to keep in mind is that choosing the right working capital management strategies during a financial crisis is one of the best ways to solve financial issues (Salehi et al. 2019). WCM is related to the short-term capital required to pay for operational demands, which account for a sizeable portion of a company's balance sheet (Le, 2019). The companies that have a high ratio of liquidity, quickness, and cash conversion cycle (CCC) have attempted to draw in more new customers by extending the due date for accounts receivable so they can increase sales performance. They have also tried to decrease the turnover of liabilities so they can work with more suppliers in the market. The firms with a larger CCC ratio, as well as those whose primary current assets were accounts receivable and short-term investments, managed to

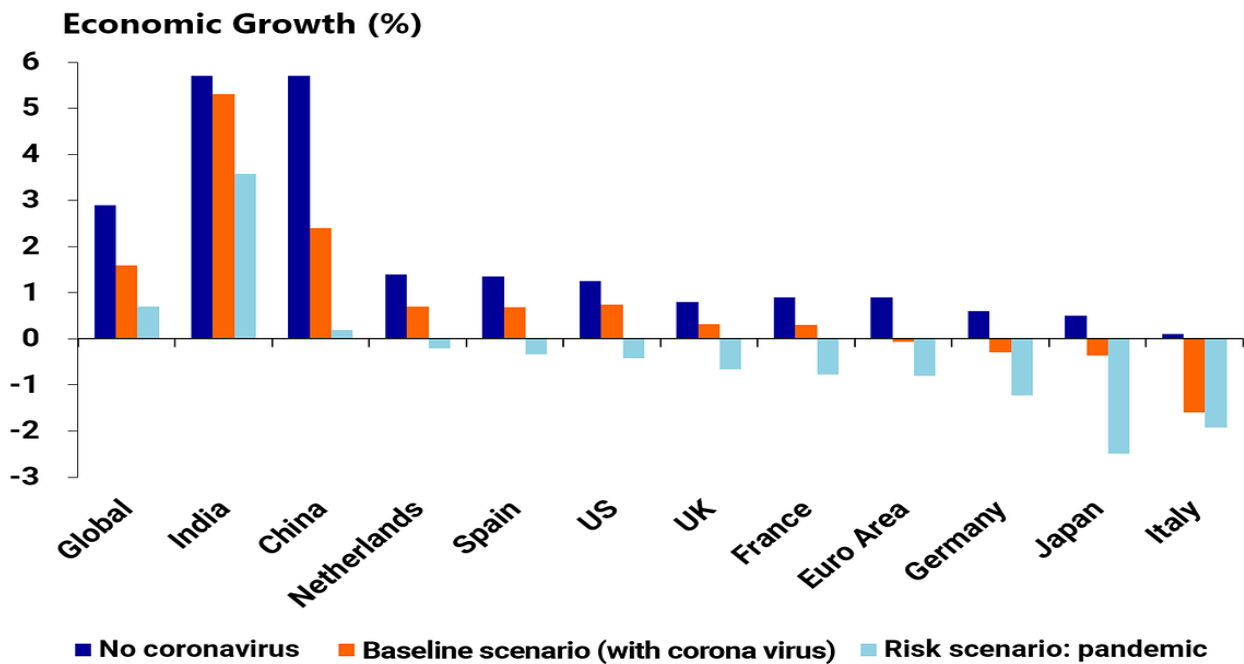
achieve greater sales returns across the different WCM strategies. Our findings also show that while businesses operating in big cities tend to have lower sales returns, four-wheeler automakers in India have the internal capacity to achieve high return on sales (ROS) results.

1.1 Crisis around world:

According to Ernst & Young, different businesses find it difficult to have adequate control over their working capital (WC) and short-term cash flows. In more concrete terms, the Ernst & Young 2019 WC research noted that the 2000 top corporations in the United States and Europe could extract up to US\$ 1 trillion if they managed their Working Capital well. According to a PwC analysis, US business activity is slowing down as millions practices social isolation to stop the spread of Covid-19. As a result, enterprises are either already experiencing or anticipate significant restrictions on cash and working capital, which might result in a change in liquidity.

Fig. 1: Economic growth of various countries during covid-19.

Global Economic Impact Of COVID-19



Source: Rabobank, Macrobond

Bloomberg | Quint

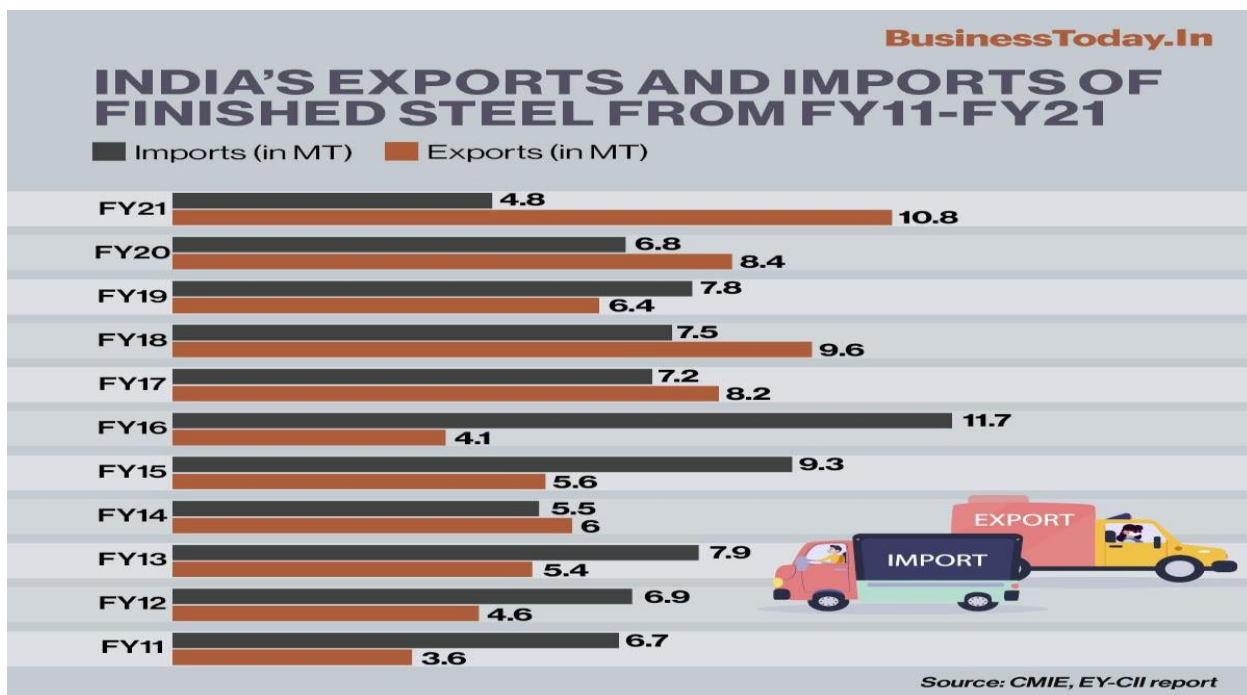
In spite of the pandemic and the emergence of new global challenges, including the consequences of conflicts, the Indian economy still maintains a favorable outlook. India's economic growth remains the most robust among all leading economies, and it remains well-prepared to confront global adversities.

1.2: Steel Industry in India:

The Indian steel industry stands as a robust pillar of the nation's economy, characterized by its significant growth and resilience. With a rich history dating back to ancient times, the modern Indian steel sector has undergone a remarkable transformation, emerging as one of the world's largest producers and consumers of steel.

During the fiscal year 2022, the steel industry anticipates a 17% surge in demand, reaching 110 million tonnes, primarily propelled by the escalating construction projects. Tata Steel is strategically aiming to establish additional scrap-dependent facilities, targeting a minimum capacity of one billion tonnes by 2025. Moreover, Tata Steel in India has laid out plans to augment its yearly production capacity from the current 34 million tonnes per annum (MTPA) to 55 MTPA by the year 2030 (**Ibef 2023**). India ranks as the second-largest producer of crude steel globally, generating 125.32 million tonnes (MT) of crude steel and producing 121.29 MT of finished steel in the fiscal year 2023. In the fiscal year 2022, the utilization of finished steel amounted to 105.751 MT, whereas in the fiscal year 2023, it escalated to 119.17 MT. Projections suggest that India's steel production is expected to expand by 4-7%, reaching a range of 123-127 MT in the fiscal year 2024 (**Ibef 2023**).

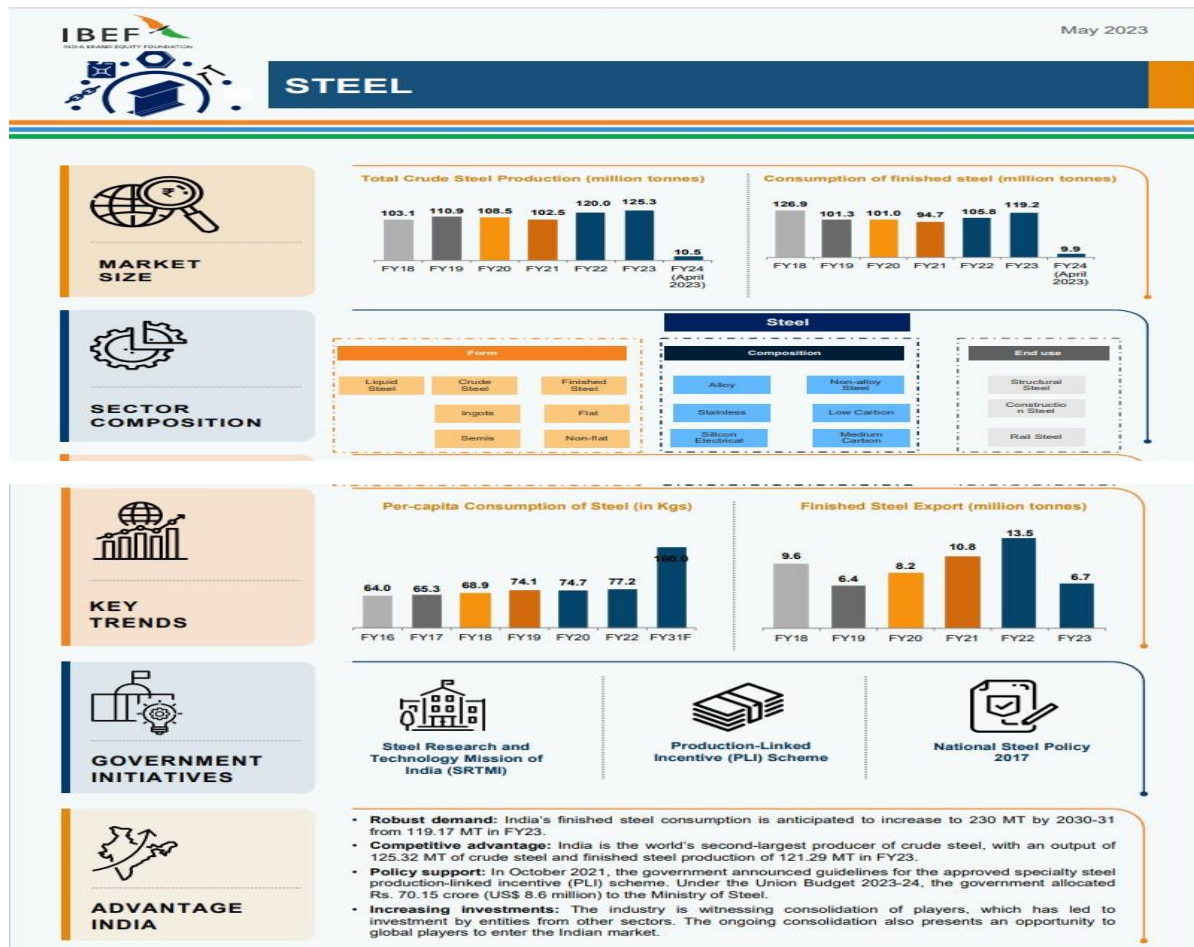
Fig. 2: Steel industry can steer India towards \$5 tn economy by 2025: EY-CII report



Source: EY CII Report

As per a report by EY, India's export has been the highest after the covid during the Financial year 2021 as compared to 2020 whereas the import has seen a decrease as compared to last year. From the above figure we can analyse that after the covid period which is post 2019, the import has been reduced whereas the export shows an increasing trend.

Fig. 3: Shows the growth of Steel Industry



Source: ibef.org/industry/steel

2. Literature Review:

- **Pant et al. (2023)**, The central aim of this research was to scrutinize how working capital affected the performance of a substantial cohort of Indian manufacturing companies in the context of the pandemic and supply chain disruptions. The study relied on a trove of secondary data sourced from the formidable Prowess database, containing information pertaining to Indian manufacturing firms listed on the Bombay Stock Exchange (BSE) 500. To unravel the intricate relationships within this dynamic, panel data regression analysis was the chosen method, serving as the compass to navigate the data landscape. The study unearthed a striking revelation - an abundance of working capital exerted a highly favorable and consequential impact on a company's performance. These groundbreaking findings not only challenge conventional wisdom regarding working capital investments but also underscore the profound and advantageous influence that larger working capital reserves wield over business performance. This research, in particular, casts a spotlight on manufacturing companies that grappled with financial adversity in the aftermath of the COVID-19 pandemic, primarily due to their acute shortage of operational capital.

- **Hidayat (2022)** In his research endeavor, the focal point is the exploration of the intricate dance between debt, the swift rotation of working capital, and the fluidity of assets in shaping the profitability of coal mining entities gracing the roster of the Indonesian stock exchange. As the curtains rise on the stage of statistical analysis, the spotlight reveals the working capital turnover data t-test, which, with a theatrical flair, presents a numeric performance of 0.986827 at a significance level of 0.05. In this captivating act, it becomes evident that the graceful pirouette of working capital turnover does not hold a leading role in influencing the profitability of the coal mining companies that grace the Indonesian Stock Exchange.
- According to **Palraj and Krishnamoorthy (2022)**, this research has a dual mission: firstly, to gauge the efficiency of working capital management, and secondly, to gauge the operational effectiveness of receivables and payables in the context of the COVID-19 pandemic. The study employs an analytical methodology leveraging operational efficiency ratios and the financial records of organizations spanning the past four years. The results revealed a consistent negative trend in working capital from 2018 to 2021, indicating insufficient working capital management. According to the findings, the company should reduce its current obligations to bolster its working capital. Towards the end of December 2019, a significant number of pneumonia cases, without a discernible origin, were documented within the urban confines of Wuhan in southern China. It was on January 7, 2020, that the Centres for Disease Control (CDC) officially categorized this mysterious pneumonia as a novel coronavirus pneumonia, as noted by (Lu et al. in 2020).
- **Gaikwad and Dhokare (2020):** The authors of this report made the point that the COVID-19 pandemic touched every country and had an impact on every sector of industry. China, the country with the second-biggest economy in the world, is currently stagnating. The outbreak is considered a national emergency by organisations dedicated to planetary health. We could have felt China's influence as a regional force and the impact on India's supply chain. The impact of the pandemic on economic activity is not limited to the domains of aviation, transportation, tourism, and hospitality. Analysts predict that the gross domestic product will increase for the quarter ending in January 2020.
- **Peterson Ozili, (2020):** The influence of COVID-19's spillover on the global economy is elaborated upon and addressed by the author in this article. They base their evaluation of the restraints, monetary policy, fiscal policy, and public health policies that were implemented throughout the time period on observations from the actual world. The study investigates experimentally how social distance policies affect economic activity and stock market indexes. According to the data, the amount of economic activity and the closing, opening, lowest, and maximum stock prices of key stock market indices were significantly impacted by the growing number of lockdown days, monetary policy actions, and foreign travel restrictions.
- **McKibbin and Fernando (2020):** In this research paper, the authors elucidate the idea that a localized outbreak, even when kept under control, possesses the potential to exert a profound and immediate influence on the worldwide economy. These hypothetical scenarios vividly illustrate the immense financial burdens that could be averted through increased investments in robust public health systems. While this imperative extends universally, its urgency becomes most evident in less developed economies, where healthcare infrastructure is less advanced, and communities are

densely populated, rendering them especially susceptible to the need for bolstered healthcare investments.

- **Rekha Rani (2020)** in her research paper titled “The Effects of the Coronavirus on the Indian Economy,” The second-largest oil refiner in India, Bharat Petroleum Corp., was subjected to a protracted privatisation process, which has resulted in a possible decrease in state revenues. This reduction is thought to be at least \$2 billion less than the first projections. In the same time frame, the price of Bharat Petroleum Corp's stock has dropped significantly—it has fallen by about 27 percent since January. In comparison, the NSE Nifty 50 index as a whole has dropped by around 20 percent as a result of the turbulence in the world markets.

3. Objectives of the Study:

- I. To assess the management of working capital in chosen public sector steel companies in India, both pre and post the onset of the COVID-19 pandemic.
- II. To figure out the causes of COVID-19's greatest impact on selected public sector steel industry.

4. Hypothesis:

- H0: There is no significant difference in the working capital management in selected steel industry in India before and after covid
- H1: There is significant difference in the working capital management in selected steel industry in India before and after covid

5. Research Methodology of the Study:

This study examines the effects of COVID-19 on working capital management, in selected steel industry before and after covid, and is both descriptive and analytical in nature. The data for the study is collected using secondary sources through the annual reports of selected public sector steel industry of India.

Period of Study:

The period of the study is six years 2017-2022. Three years before covid and three years after covid is taken in our study. The pre covid year taken in our study is 2017, 2018 and 2019 whereas after covid year taken is 2020, 2021 and 2022. Paired sample t test is used to analyse the result.

Sample Size: The sample is taken from Eight public listed steel companies as per **Ministry of Steel, Government of India**. The sample companies taken in our study is based on the availability of data. The companies selected are Steel Authority of India Ltd (SAIL), Rashtriya Ispat Nigam Ltd (RINL), NMDC Ltd, MECON Ltd, MOIL Ltd, KIOCL Limited, MSTC Limited and Ferro Scrap Nigam Ltd. (FSNL).

6. Data analysis and Interpretation:

Table 1: Working capital (Rs. Crore) for year 2016-17

Company Name	Year	Net Working Capital
Steel Authority of India Ltd (SAIL)	2017	-20773.8
Rashtriya Ispat Nigam Ltd (RINL)	2017	-6623.32
NMDC Ltd	2017	5374.39
MECON Ltd	2017	39423.12
MOIL Ltd	2017	231601.5
KIOCL Limited	2017	201996.4
MSTC Limited	2017	18672
Ferro Scrap Nigam Ltd. (FSNL)	2017	15855.01

Table 2: Working capital (Rs. Crore) for year 2017-18

Company Name	Year	Net Working Capital
Steel Authority of India Ltd (SAIL)	2018	-13811.2
Rashtriya Ispat Nigam Ltd (RINL)	2018	-9004.44
NMDC Ltd	2018	5298.28
MECON Ltd	2018	35594.26
MOIL Ltd	2018	218265.3
KIOCL Limited	2018	208945.4
MSTC Limited	2018	22063
Ferro Scrap Nigam Ltd. (FSNL)	2018	16428.51

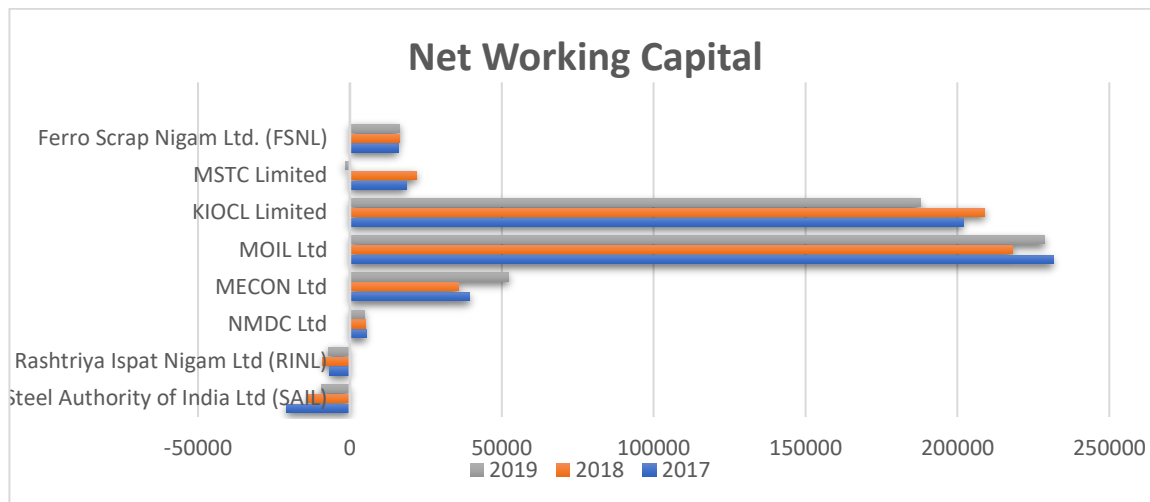
Source: Annual Report

Table 3: Working capital (Rs. Crore) for year 2018-19

Company Name	Year	Net Working Capital
Steel Authority of India Ltd (SAIL)	2019	-9359.66
Rashtriya Ispat Nigam Ltd (RINL)	2019	-7180.38
NMDC Ltd	2019	4901.92
MECON Ltd	2019	52236.37
MOIL Ltd	2019	228716.4
KIOCL Limited	2019	187773.2
MSTC Limited	2019	-1473.14
Ferro Scrap Nigam Ltd. (FSNL)	2019	16406.98

Source: Annual Report

Fig.:4 Net working Capital Management Prior to Covid



Source: Authors Compilation

Table 4: Working capital (Rs. Crore) for year 2019-20

Company Name	Year	Net Working Capital
Steel Authority of India Ltd (SAIL)	2020	-4060.59
Rashtriya Ispat Nigam Ltd (RINL)	2020	-11009.2
NMDC Ltd	2020	4525.12

MECON Ltd	2020	37649.63
MOIL Ltd	2020	183271.8
KIOCL Limited	2020	179867
MSTC Limited	2020	-568.81
Ferro Scrap Nigam Ltd. (FSNL)	2020	19,116.8

Source: Annual Report

Table 5: Working capital (Rs. Crore) for year 2020-21

Company Name	Year	Net Working Capital
Steel Authority of India Ltd (SAIL)	2021	-14529.62
Rashtriya Ispat Nigam Ltd (RINL)	2021	-11491.85
NMDC Ltd	2021	5145.86
MECON Ltd	2021	33880.65
MOIL Ltd	2021	185425.53
KIOCL Limited	2021	-80,632.56
MSTC Limited	2021	810.21
Ferro Scrap Nigam Ltd. (FSNL)	2021	20182.44

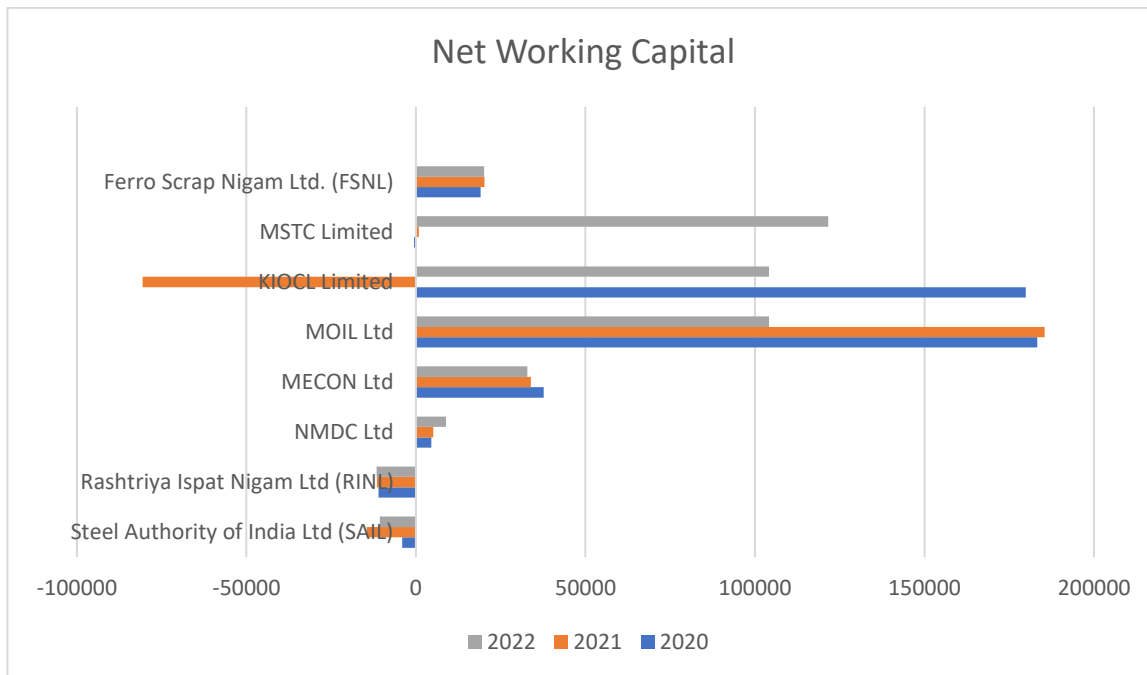
Source: Annual Report

Table 6: Working capital (Rs. Crore) for year 2021-22

Company Name	Year	Net Working Capital
Steel Authority of India Ltd (SAIL)	2022	-10657.99
Rashtriya Ispat Nigam Ltd (RINL)	2022	-11613.71
NMDC Ltd	2022	8843.44
MECON Ltd	2022	32836.68
MOIL Ltd	2022	104170.31
KIOCL Limited	2022	104,179.22
MSTC Limited	2022	121584.83
Ferro Scrap Nigam Ltd. (FSNL)	2022	20128.28

Source: Annual Report

Fig.5: Net working Capital Management Post Covid



Source: Authors Compilation

7. Analysis and Interpretation of Data:

Within this array of information, three tables stand prominently: Paired Samples Test, Paired Samples Statistics, and Paired Samples Correlations. The first table, Paired Samples Statistics, unveils a treasure trove of univariate descriptive statistics, encompassing means, sample sizes, standard deviations, and standard errors for all the variables at play. As you delve into the second table, Paired Samples Correlations, you'll uncover the intricate dance of bivariate Pearson correlation coefficients, each accompanied by a rigorous two-tailed test of significance, diligently examining the relationships between pairs of variables. Finally, the third table, Paired Samples Test, unveils the curtain on the hypothesis test results, where the significance and implications of your data come to life.

Output: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
covid	Before-	60055.26	24	92052/85	1879.21
	After-covid	38210.56	24	70386.65	14367.62

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Before-covid & After-covid	24	.649	.001

Paired Samples Test								
	Paired Differences				95% Confidence Interval of the Difference			
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig.(2-tailed)
Pair 1 Before_covid & after_covid	21844.69	70875.1	14467	-8083.24	51772.63	1.510	23	0.145

Source: SPSS

Data can be categorized as "pre-COVID-19" for the period before the pandemic and "post-COVID-19" for the period after. These two sets of data represent measurements taken at distinct points in time, and they serve as the foundation for expressing the hypotheses in this paper in a dual perspective.

- H0: There is no significant difference in the working capital management in selected steel industry in India before and after covid
- H1: There is significant difference in the working capital management in selected steel industry in India before and after covid

The working capital management (WCM) of selected Indian Steel Companies exhibited a sturdy and favorable correlation, both before and after the advent of the COVID-19 pandemic ($r = 0.649$, $p < 0.001$)

A notable and meaningful disparity in the average working capital management (WCM) emerged when comparing the periods before and after the COVID-19 era among handpicked Indian steel companies. There is no significant difference between ($t=1.510$, $p < 0.001$)

On average, the points prior to COVID exceeded those after COVID by 21844.69 points. (95% CI-8083.24, 51772.63])

SWOT (Strength, Weakness, Opportunity and Threat) Analysis of Steel Industry in India:

Based on an estimation, the steel industry generated a yearly revenue of \$341,122 million in 2022. Within this figure, the steel industry's net income amounted to \$47,365 million. To oversee its global operations, the company employs approximately 136,643 individuals.

Table 7: Shows SWOT of Steel Industries

Strength:	Weakness:
<ul style="list-style-type: none">❖ Easy Access to Raw Material❖ Cheap Labor❖ Quality Operations❖ Shipping & Transport❖ Community Focused❖ Green Economy	<ul style="list-style-type: none">❖ High Capital Investment❖ Deficiencies & Risk❖ Limited Productivity❖ Expensive Material❖ Limited Budget For R&D
Opportunities:	Threats:
<ul style="list-style-type: none">❖ Infrastructure❖ Merger & Acquisition❖ High Demand & Export	<ul style="list-style-type: none">❖ Price Conscious❖ Tech Development❖ Limited Growth

Source: swotandpestleanalysis.com

8. Conclusion:

The pandemic has exerted a substantial influence on the cash flow, liquidity, and working capital of Indian businesses. Although some sectors have implemented targeted strategies to address working capital issues, there remains a considerable requirement for Indian companies to enhance their working capital management practices. Every company needs to adopt a tailored and structured approach to working capital optimization. Working capital management should not be confined to mere financial best practices; instead, it should be seen as an all-encompassing strategy for enhancing efficiency and profitability throughout the entire organization. The importance of working capital has surged significantly in the wake of the Covid-19 pandemic. The working capital management (WCM) of chosen Indian steel companies demonstrated a robust and advantageous connection. An intriguing and substantial contrast in the average working capital management (WCM) surfaced when contrasting the periods before and after the COVID-19 era among handpicked Indian steel companies. There exists no noteworthy distinction ($t=1.510$, $p < 0.001$). On average, the scores preceding the COVID era exceeded those following it by 21,844.69 points, within a 95% confidence interval ranging from -8,083.24 to 51,772.63.

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