

A Liquidity Analysis of Power Grid Corporation of India

Nameera Aziz

Department of Commerce
Integral University, Lucknow

Usman Ghani*

Department of Commerce
Integral University, Lucknow

*Corresponding author (email: gani.usman12@gmail.com)

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Abstract

The present research investigates the effect of working capital management on the liquidity and profitability of Power Grid Corporation of India Ltd. during 2008-2022. The study utilized secondary data derived from the company's annual reports and financial statements. The effectiveness of the management of current assets and current liabilities was measured using several liquidity and working capital ratios. In this study, multiple regression analysis was used to investigate the effect of working capital management on profitability proxied by ROA. This finding indicates that liquidity management positively affects profitability. The regression model explains nearly 85% of the variance in ROA. This means the model is fitting well. The two exceptions are Net Working Capital (NWC) and Current Ratio (CR), which are statistically significant indicators of profitability. The results indicate that for the organization's financial stability, effective functioning, and continuous development, it is important to achieve the optimal combination of liquidity and profitability.

Keywords

Current Ratio, Liquidity, Power Grid Corporation of India Ltd., Profitability, Working Capital Management

1. Introduction

Five regional grids are formed to operate the Indian power system. The concept of National Grid evolved in the early 1990s to consolidate the separate regional grids to facilitate the transfer of power from resource-rich regions to resource-deficient regions and to maximize utilization of generation and transmission resources. At that time Indian power sector had five regional grids which were mostly isolated with limited interconnections and integrated operation. Research on the Indian power sector demonstrated that integrated national-level development and functioning of regional grids could improve system reliability, reduce overall system costs, and reduce the requirement for additional generation capacity (Dhar & Shukla, 2015).

A notable aspect of India's power sector reforms has been the development of a single nationwide transmission system. Recent efforts have been directed towards strengthening interstate transmission lines, enhancing interregional power transfer capacity and facilitating integration of renewable energy for a reliable and economical power supply at the national level (Ministry of Power, Government of India, 2025). The Power Grid Corporation of India Limited (POWERGRID) is the largest transmission utility in India with respect to a transmission network owned and operated on interstate basis. It is also engaged in transmission planning, grid operation and integration of renewable energy resources. The transmission infrastructure built over the years has enhanced the reliability of the grid, operating efficiency and power exchange (flow) between different regions/states across the country.

So, the Indian electrical system was divided into five regional grids for planning and operation. The grid formation at regional levels and hence a National Grid was considered as one of the key components of long-term power sector objectives in India. Shukla et al. (2015) developed a mixed-integer programming framework specifically for the Indian power system and examined transmission expansion, coordinated operation of regional grids, optimal allocation of generation, and inter-state and inter-regional power transfers. Their analysis showed that coordinated grid operation and appropriate transmission expansion could improve the utilization of existing generation facilities and reduce system costs.

The first inter-regional linkages were largely established for the purpose of trading operational surpluses across areas. However, as the planning philosophy gradually shifted from regional self-sufficiency to national-level planning, inter-regional transmission linkages were increasingly associated with generation projects whose beneficiaries were located on the other side of regional boundaries. This transition reflected the increasing importance of coordinated transmission planning and the geographical mismatch between electricity-generation resources and demand centers. The optimization-based analysis of the Indian transmission system by Shukla et al. (2015) similarly emphasized the importance of coordinated operation of regional grids and expansion of inter-regional transmission infrastructure.

The first integration was based on asynchronous HVDC back-to-back lines, which permitted a controlled power flow across locations that did not need to run at the same frequency. Subsequently, the Indian power system progressed towards high-capacity synchronous interconnections. Narasimhan et al. (2015) documented the progressive synchronization of India's regional grids, noting that the North-Eastern Region was synchronized with the Eastern Region in 1991, followed by the Western Region in 2003 and the Northern Region in 2006.

This gradual process ultimately led to the synchronous integration of the Southern Region with the rest of the country.

The importance of regional-grid integration was also demonstrated through quantitative analysis. Dhar and Shukla (2015) examined the economic, environmental, and reliability implications of integrating India's regional electricity grids into a single national system. Their analysis suggested that integrated national-level operation could reduce total system costs, capacity requirements, and unserved energy compared with separate regional development. The study therefore provided an important analytical basis for considering national grid integration not only as a transmission-development strategy but solely as a means of improving economic efficiency and system reliability.

In December 2013, the Southern and Central Grids were synchronized over the Raichur–Solapur transmission link, a significant step forward in regional grid integration. This resulted in the synchronous interconnection of all five regional grids and established the “One Nation–One Grid–One Frequency” configuration. The development was significant because it enabled electricity to be transferred across the country's regional boundaries within a single synchronous grid (Narasimhan et al., 2015; Ministry of Power, 2023).

The creation of the integrated national grid also introduced new operational and reliability considerations. Nagarjun (2014) examined the future role of the Indian National Grid following the synchronous integration of the Southern Region and emphasized the importance of maintaining system reliability as the scale and complexity of the interconnected system increased. The study also identified renewable-energy integration, grid security, natural disasters, and emerging cyber-security concerns as important challenges for the operation of the increasingly interconnected Indian power system.

By the end of the Twelfth Five-Year Plan, India had developed substantial inter-regional transmission capacity, and further expansion was planned to accommodate increasing electricity demand and facilitate greater inter-regional power transfers (Central Electricity Authority [CEA], 2017). The integration of the regional grids has enabled power to be transferred from resource-rich or surplus regions towards load-centric or deficit regions, thereby improving the utilization of the country's geographically dispersed generation resources. Such an integrated transmission system has also created the infrastructure required for greater electricity trading between regions and for the integration of renewable-energy resources into the national electricity system (Ministry of Power, 2021; CEA, 2017).

The evolution of India's electricity network from regional grids towards an integrated national grid therefore represents a transition from regional self-sufficiency towards coordinated national-level planning and operation. The literature indicates that such integration can provide economic, operational, and reliability benefits by improving the utilization of generation and transmission capacity and enabling electricity transfers between regions (Shukla et al., 2015; Dhar and Shukla, 2015). At the same time, the increasing interconnection of the power system has created additional requirements for maintaining grid stability, reliability, security, and flexibility, particularly with the growing contribution of variable renewable-energy sources (Nagarjun, 2014; Narasimhan et al., 2015).

Thus, the development of the Indian National Grid was not simply a transmission-infrastructure initiative; it represented a broader transformation in the planning and operation of India's electricity sector. The movement from regionally isolated systems towards a synchronously interconnected national system has provided a platform for more efficient power transfers, coordinated resource utilization, electricity-market development, and the integration of diverse generation resources across the country.

2. Review of Literature

Effective management of working capital (WC) is vital for ensuring the liquidity, operational efficiency, and profitability of the organization, and it is one of the most studied issues in the financial management literature. Mehta et al (2025) attempted to find out the difference in working capital management practices among the seven industries in India (automobile, cement, steel, information technology, telecommunications, fertilizer and chemicals and petrochemicals). The differences in working capital management methods in the study led to the classification of operating working capital management policies. The industry was studied using different working capital management performance measures, including return on capital employed (ROCE), working capital turnover ratio (WCTR), current ratio (CR), inventory turnover (ITO), days inventory outstanding (DIO), days payable outstanding (DPO), days sales outstanding (DSO), and cash conversion cycle (CCC).

The study conducted by Bagchi et al. (2012) in Indian FMCG industry aimed to examine the relationship between working capital management and profitability using cash conversion cycle (CCC), age of inventory, age of debtors, age of creditors, debt to total assets ratio and debt equity ratio as explanatory variables and return on total asset and return on investment as the measures of profitability. Based on correlation and panel data regression techniques, the study finds that working capital management elements are inversely associated with firm profitability, using data on Indian FMCG companies for the period 2000–01 to 2009-10. Thus, the authors concluded that working capital management is a crucial financial and liquidity choice related to profitability. It was also noted that the current asset utilization is important by Pais and Gama (2015) who studied the relationship between the utilization of current asset and the operating profitability of the Indian cement and tea industry. They found that the current asset utilization was positively correlated with operating profitability of the firms investigated. Later Moussa (2019) studied the efficiency in working capital management in Indian cement industry from 1992-93 to 2001-02. The authors developed measures of performance, utilization, and efficiency, and compared individual companies to an industry norm rather than the usual working capital ratios. The results showed that the Indian cement industry had not succeeded in achieving perfection in working capital management efficiency over the period of the research. The Indian steel industry is another example where liquidity and working capital management are crucial. Enqvist et al. (2014) had studied the relationship between liquidity and profitability in Steel Authority of India Limited (SAIL), a large steel company in India and had reported a positive relation between the two. The research found that efficient liquidity management is important for strong working capital and success. Similar studies from outside India also support the link between working capital management and corporate performance. Ojha (2019) has studied the working capital management and profitability of

Pukar International Trading in Nepal. The study examined several statistics, including return on assets, current ratio, average collection period, and average payment period. The data showed that profitability is negatively associated with average collection duration and average payment period but directly associated with the current ratio. The study also recommended that increasing the receivables collection period may be one of the factors that can contribute to create shareholder value. Likewise, Khan and Ghazi (2013) studied the impact of working capital management on the performance of firms on KSE. Some recent working capital management studies have analysed the implications of the major aspects of the CCC i.e. days receivable, days inventory and days payable on the firm performance. The performance of the company is generally measured by market-based indicators (e.g., Tobin's Q) and accounting-based measurements (e.g., gross profit). The results indicate that the management of accounts receivable, inventories and accounts payable may have a significant impact on improving profitability and the value of the firm (Banos-Caballero et al., 2014). The results show a negative and significant relationship between the cash conversion cycle and days receivable and Tobin's Q. In contrast, inventory and payable days have a positive and significant relationship with Tobin's Q. It was also noted that there were some changes in the type of linkages between the components of working capital and gross profit, which suggests that the effect of each of the components of working capital could change when using other indicators of success. The literature review concludes that working capital management is closely associated with the performance and profitability of companies. However, the nature and extent of association may differ across components of working capital at the industry, company, country, and individual levels. Research in India is focusing on the efficient utilization of current assets, liquidity management, inventory management, receivables management, and the cash conversion cycle. The findings also indicate that working capital practices vary across industries and cross industry analysis is crucial for understanding how variations in industries operating characteristics affect working capital efficiency.

3. OBJECTIVES OF THE STUDY

1. To study the working capital management in practices of Power Grid Corporation of India Limited
2. To assess the liquidity position of Power Grid Corporation of India Limited.
3. To study the effect of working capital management on the profitability of Power Grid Corporation of India Limited.
4. To examine the impact of working capital management on the profitability of Power Grid Corporation of India Limited.

4. Research Questions

RQ1: How effectively does Power Grid Corporation of India Limited manage its working capital?

RQ2: RQ2: What is the liquidity status of PGCIL over the study period?

RQ3: Is there any substantial association between working capital management and the profitability of Power Grid Company of India Limited?

RQ4: Does working capital management have a significant impact on the profitability of Power Grid Corporation of India Limited?

5. Hypotheses of the Study

Null Hypothesis (H₀)

H₀₁: Working Capital management does not have a significant impact on profitability of Power Grid Corporation of India Limited.

Alternative Hypothesis (H₁)

H₁₁: The working capital management is closely linked with the profitability of Power Grid Corporation of India Limited.

6. Research Methodology and Data Source

Period of Study: The study period is 15 years, from 2008-09 to 2022-23. **POWERGRID:** Power Grid Corporation of India Limited. **INVESTMENT IN DEBT:** This study is based on the secondary data obtained from the financial statements and annual reports of Power Grid Corporation of India Limited. Information about current assets, current liabilities and other financial indicators were gathered from the relevant annual reports. The evaluation of current assets and current liabilities is done in the context of working capital management. Current assets minus current liabilities are usually the formula used to calculate working capital. The efficient working capital management is achieved by keeping a balance between liquidity and profitability and maintaining enough working capital to meet the short-term demands and requirements of the business (Aktas et al., 2015).

The liquidity position and working capital management of Power Grid Corporation of India Limited is analyzed with the help of multiple liquidity ratios, working capital ratios and relevant statistical methods and the entire data obtained is analyzed with the help of these. The study further assesses the relationship of working capital management and profitability for the investigated period.

Analysis of the Study

Working capital is the money the company uses in its day-to-day operations after subtracting the current liabilities. It is usually defined as:

Working Capital = Current Assets – Current Liabilities

Current assets are used for the ongoing operations and are continually turned into cash, and cash is then utilized to finance operating activities and to buy or replenish current assets. Therefore, working capital is a continual investment that is used to run the operations of a business each day (Aktas et al., 2015).

The current study has investigated the working capital position of PGCIL in the years 2008–09 to 2022–23. Current asset and liabilities are determined from company published annual report and financial statements. The data are utilized to compute the networking resources and investigate how these resources change over time. The financial information for this analysis is derived from the POWERGRID annual reports.

The current assets and current liabilities are analyzed to gain some understanding of the financial position of the company and its capacity to pay off the current obligations. There are various ratios which helps to evaluate the liquidity position of the company, working capital indicators determine the effectiveness with which short term financial resources are used. The

company's annual reports also reveal information in the areas of liquidity, cash flow, and capital resources, further highlighting the company's financial position (Power Grid Corporation of India Limited, 2022).

Hence, an analysis of the working capital of Power Grid Corporation of India Limited is carried out based on trend analysis of working capital, the composition of working capital, the management of current assets and current liabilities, and the interrelationship between working capital management and profitability for the period of fifteen years in the study.

Table 1. Statement showing Current assets and Current liabilities of Power Grid Corporation

Amount as on 31 st March (Rs Crores)															
Particulars	22-Mar	21-Mar	20-Mar	19-Mar	18-Mar	17-Mar	16-Mar	15-Mar	14-Mar	13-Mar	Mar 12	11-Mar	10-Mar	9-Mar	8-Mar
CURRENT ASSETS															
Current Investments	0	0	0	0	0	2.5	35.64	185.43	184.35	183.26	183.26	184.34	0	0	0
Inventories	1352	1362.82	1400	1226.56	1038.45	906.95	823.68	717.75	712.4	551.53	440.31	381.51	344.9	297.57	248.22
Trade Receivables	9106.82	3621.34	4867.90	4628.74	3638.96	3,221.10	2,737.97	2,118.65	1,578.46	1,434.09	1,497.49	1,114.00	2,214.86	1,373.56	1,100.50
Cash And Cash Equivalents	2971.04	5273.54	5394.5	4332.04	2170.43	3,340.59	2,453.72	2,062.98	4,417.52	1,661.97	2,336.88	3,680.06	3,277.64	2,428.88	1,865.59
Short Term Loans And Advances	328.27	5428.83	696.87	416.87	46.88	35.14	794	566.42	472.04	595.03	425.96	2,037.28	3,375.60	2,893.56	2,162.11
Other Current Assets	16570.66	19929.89	16172.35	15351.65	5720.31	3,666.03	3,136.79	2,278.87	1,735.63	1,839.57	1,445.99	2,229.16	67.52	4.39	0.36
Total Current Assets	30329.29	35616.42	28532.18	25955.58	12615.03	11,172.31	9,981.80	7,930.10	9,100.40	6,265.45	6,329.89	9,626.35	9,280.52	6,997.96	5,376.78
CURRENT LIABILITIES															
Short Term Borrowings	20465.87	1800	3000	4300	1000	1,500.00	2,000.00	1,200.00	2,700.00	2,000.00	1,650.00	1,450.00	1,248.59	750	750
Trade Payables	266.14	186.3	225.72	364.11	240.34	413.98	313.89	392.97	329.07	246.73	200.78	196.66	1,060.62	1,072.88	985.15

Other	201	365	360	362	295	27,1	21,3	19,0	15,5	11,6	8,46	6,30	8,78	7,21	4,38
Current	29.5	14.9	37.9	06.4	67.4	90.3	91.3	40.3	20.0	93.4	3.56	7.46	7.61	0.08	4.31
Liabilities	9	2	6	7	2	1	0	6	4	6					
Short Term	932.	835.	741.	700.	105	537.	1,54	1,21	968.	768.	1,05	2,55	2,45	2,18	1,35
Provisions	31	88	95	59	9.58	21	8.38	1.95	02	31	6.67	8.82	8.29	9.82	2.59
Total	417	393	400	415	318	29,6	25,2	21,8	19,5	14,7	11,3	10,5	13,5	11,2	7,47
Current	93.9	37.1	05.6	71.2	67.3	41.5	53.5	45.2	17.1	08.5	71.0	12.9	55.1	22.7	2.05
Liabilities					4	0	7	8	3	0	1	4	1	8	

Source: Compiled from www. Money control .com

Table 1 presents the main current assets and current liabilities of Power Grid Corporation of India Limited for the period 2008–2022. Over this period, the company's current assets rose considerably, climbing from ₹5,376.78 crore to ₹30,329.29 crore. This growth was largely driven by increases in trade receivables, cash and cash equivalents, inventories, and other current assets.

On the liabilities side, total current liabilities increased from ₹7,472.05 crore in 2008 to ₹41,793.90 crore in 2022. Short-term borrowings and other current liabilities constitute major components of the company's current liabilities. The relatively higher level of current liabilities compared with current assets throughout the period resulted in a negative net working capital position.

Overall, the table indicates that both current assets and current liabilities expanded considerably during the study period, but the growth in current liabilities remained higher than that of current assets. Therefore, the company's liquidity and working capital position should be further examined using current ratio, quick ratio, cash ratio, working capital turnover ratio, and other relevant liquidity measures.

Table 2. Position of Net Working Capital of Power Grid Corporation Ltd. Amount as on 31st March (Rs Corers)

Years	current assets	Current Liabilities	net working capital
2008	5376.78	7472.05	-2095.27
2009	6997.96	11222.78	-4224.82
2010	9280.52	13555.11	-4274.59
2011	9626.35	10512.94	-886.59
2012	6329.89	11371.01	-5041.12
2013	6265.45	14708.5	-8443.05
2014	9100.4	19517.13	-10416.73
2015	7930.1	21845.28	-13915.18
2016	9981.8	25253.57	-15271.77
2017	11172.31	29641.5	-18469.19
2018	12615.03	31867.34	-10597.03
2019	25955.58	41571.17	-23936.58
2020	28532.18	40005.63	-26512.18
2021	35616.42	39337.1	-33595.42
2022	30329.39	41793.91	-28307.39

Average	14,340.68	23,978.33	-13732.46
Std.Deviation	10200.32	12,564.27	-10364.36
C.V %	71.13	52.40	-75.47

Source: Compiled From [www.money control.com](http://www.moneycontrol.com)

Table 1. Analysis of working capital Table 2 indicates that the company's working capital is negative for all the financial years from 17 years 2008 to financial year 2022. Besides all these, there is a huge variation in working capital figure as indicated by standard deviation -10364.36 and CV 75.47%. Company working capital -13,732.46 for 15 year's period (2008-2023). Negative working capital means that the business has over-financed its operating assets and may have difficulty in meeting its short-term liabilities served [10]. This means short term funds is being used for long term funds use. If the receivable mature before the payment became due, we can say that the business can manage to pay off its liability but need short term finance to pay for its whole obligation. The large negative working capital of a business entity also indicates that it is enjoying sufficient credit period from its vendors. However, the sum of the current liabilities can increase the liquidity of the company. (conversion of current assets will produce more liquidity for the company which needs to pay on the line facility).

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Average	14,340.68	23,978.33	-13732.46
Std.Deviation	10200.32	12,564.27	10364.36
C.V %	71.13	52.40	-75.47

Source: Compiled From [www.money control.com](http://www.moneycontrol.com)

Table 2. In this, Power Grid Corporation of India Limited has presented the net working capital position for the year 2008 till 2022. Current liabilities were consistently greater than current assets during the study period, indicating that the company operated with negative Net Working

Capital throughout the study period. Net working capital was ₹2,095.27 crore in 2008 and deteriorated to ₹18,469.19 crore in 2017. It further declined to approximately ₹19,252.31 crore in 2018, representing the most negative position during the period. However, the position improved considerably thereafter, reaching ₹3,720.68 crore in 2021, before declining again to ₹11,464.52 crore in 2022.

The average current assets and current liabilities were approximately ₹14,340.68 crore and ₹23,978.33 crore, respectively, resulting in an average negative working capital of approximately ₹9,637.66 crore. Overall, the figures indicate that the company's current liabilities consistently exceeded its current assets. However, this negative working capital position should be assessed together with liquidity ratios and operating cash flows before drawing conclusions regarding the company's liquidity management.

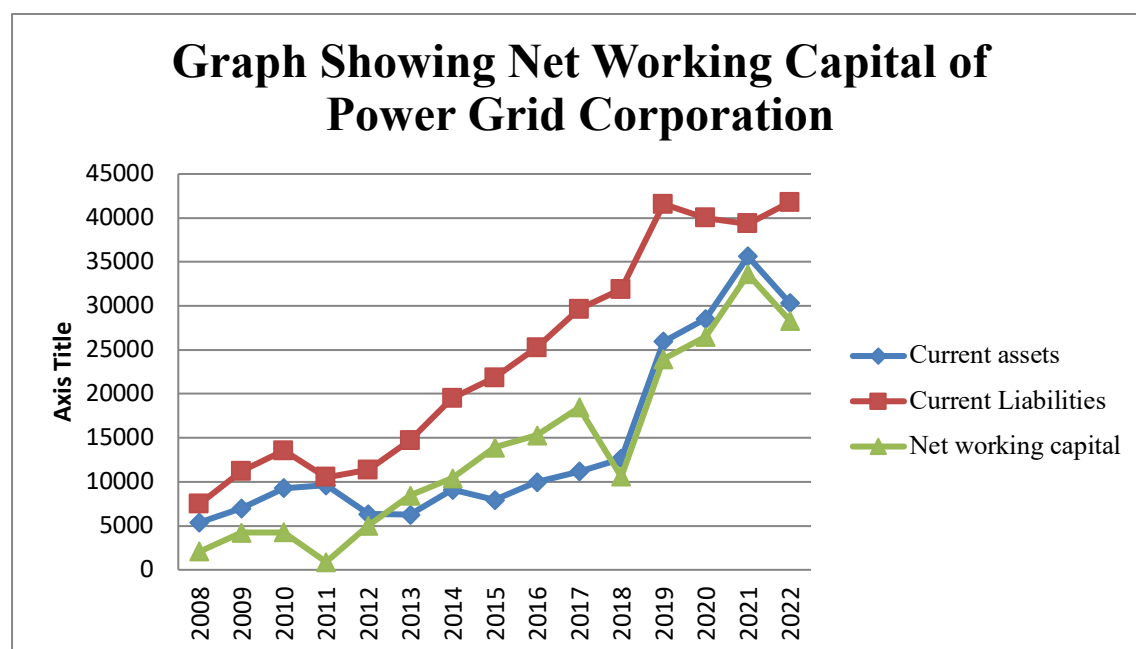


Figure 1

The graphical representation of net working capital (current asset and current liabilities) is displayed in the Above figure 1. In the 2008 current asset is less than current liability in succeeding year 2009 to 2022. The difference between current assets and liability increased significantly in 2019 and 2021 respectively. In 2022 the difference of current assets and current liability is very high (-28307.39). Negative working capital can be perceived in every year. Current ratio, liquid ratio and cash ratio are the magnitude of ascertain the working capital of entity. Table 4 shows as the figure referring number of the times current assets exceeds current liabilities.

Table 3: position of key liquidity figures of power grid corporation

Amount as on 31st March (Rs Crores)

Years	Current assets	Current liabilities	Liquid assets	Cash and bank balance
2008	5,376.78	7,472.05	5,128.56	3,340.59
2009	6,997.96	11,222.78	6700.39	2,453.72
2010	9,280.52	13,555.11	8,935.62	2,062.98
2011	9,626.35	10,512.94	9244.84	4,417.52
2012	6,329.89	11,371.01	5889.58	1,661.97
2013	6,265.45	14,708.50	5713.92	1,661.97
2014	9,100.40	19,517.13	8388	4,417.52
2015	7,930.10	21,845.28	7212.35	2,062.98
2016	9,981.80	25,253.57	9158.12	2,453.72
2017	11,172.31	29,641.50	10265.36	3,340.59
2018	12615.03	31867.34	11576.58	2170.43
2019	25955.58	41571.17	24729.30	4332.04
2020	28532.18	4005.63	24526.55	5394.5
2021	35616.42	39337.1	34253.6	5273.54
2022	30329.39	41793.91	28977.39	2971.04

Source: Compiled From www.money control.com

In Table 3. listed are the important liquidity ratios including current assets current liability, current liquid assets and cash & bank balance.

CURRENT RATIO: As a rule of thumb, a current ratio of 2:1 is a decent ratio. For Power Grid Corporation, we can see from Table 2, that the company has not maintained enough current assets to discharge all its short-term commitments. It is negative in company's capital. Current ratio is less than 1. The current ratio of the company is average. The standard deviation for the previous 10 years is 0.18, and coefficient of variance is 32.56 %. Average current ratio of the company is 0.55. Hence the comparison of current ratio to real current assets ratio of the company is average. Also, the coefficient of variation is considerable. It can be argued that the existing assets of the corporation are just short to equal the current liabilities. The current ratio, liquid ratio and cash ratio are the extent to which the working capital of an entity is determined due to various aspects like poor recovery from debtor's, high inventory turn around period in the entity, strong credit period given to company etc. Table 4 provides the data for the number of times current assets exceed current liabilities.

Table 4: Liquidity Ratio of Power Grid Corporation Ltd. (In times)

Years	Current ratio	Liquid ratio	Cash Ratio
2008	0.72	0.69	0.45
2009	0.62	0.60	0.22

2010	0.68	0.66	0.15
2011	0.92	0.88	0.42
2012	0.56	0.52	0.15
2013	0.43	0.39	0.11
2014	0.47	0.43	0.23
2015	0.36	0.33	0.09
2016	0.40	0.36	0.10
2017	0.38	0.35	0.11
2018	0.40	0.36	0.07
2019	0.62	0.59	0.10
2020	0.71	0.61	0.13
2021	0.91	0.87	0.13
2022	0.73	0.69	0.07
St. Deviation	0.19	0.18	0.12
C.V %	33.33	33.96	70.58
Average	2.49	2.50	4.31

Source: Compiled From [www.money control.com](http://www.moneycontrol.com)

Table 4

CURRENT RATIO:

A current ratio of 2:1 is regarded as a good standard. From Power Grid Corporation's perspective, Table 2 shows that the company has not maintained sufficient current assets to meet its short-term liabilities. Its negative and current ratio is less than 1, which is the capital of the company identified. The standard deviation of current ratio for the previous 10 years is 0.18, and the coefficient of variance is 32.56 %, which is an indication of a large variation in the current ratio compared to the real current ratio of the company. Also important is the coefficient of variation. It can be assumed that current assets of corporation are only short toward current liabilities. This may be attributed to numerous causes like slow recovery of the debtors due to high inventory turnover time of the debtors, strong credit duration available to the company etc.

LIQUID RATIO:

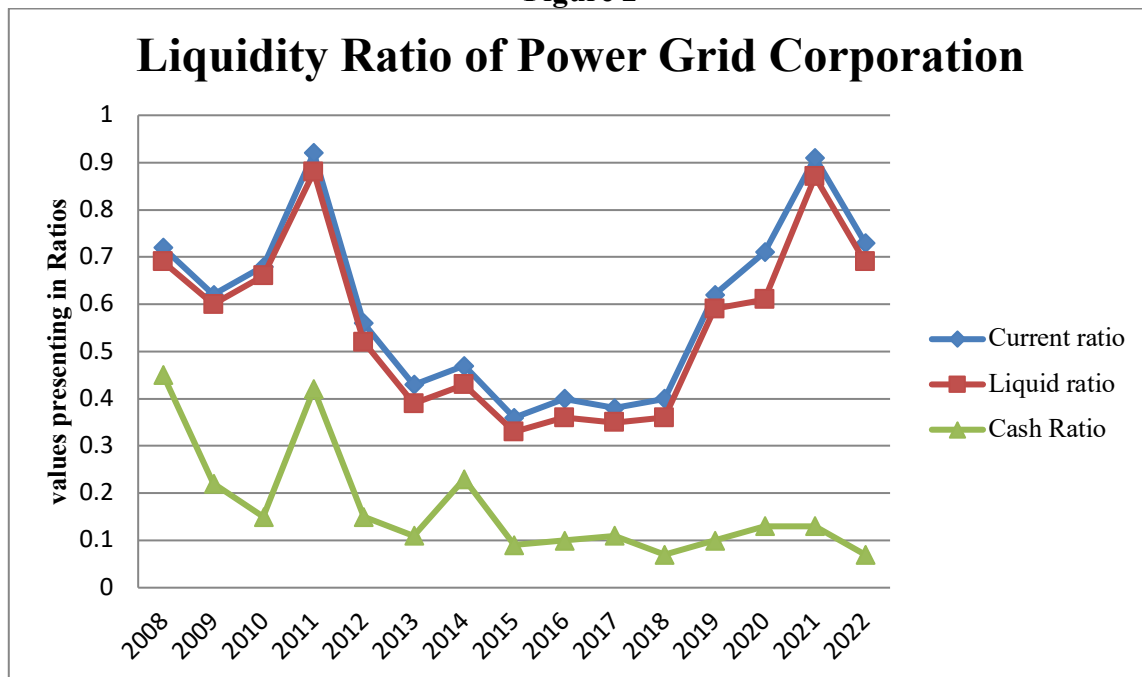
The quick ratio is quick assets divided by current liabilities. It shows how much a company can liquidate its current liabilities without selling its current assets. The average ratio for the corporation is 0.52, with a standard deviation of 0.18 and a C.V. of 34.62. It indicates the company has very few current assets to meet its current liabilities, i.e., inadequate current assets. The company has not considerable investment in inventory. It may be that substantial amount is blocked in other assets. At the beginning it is low in 2008.but in 2017 it is high. The company's liquidity ratio has improved in the year 2011, but has risen to .88, which is highest in 10 years. After that liquid ratio gradually declines succeeding years. Having regard to the

liquidity of company we construe that company has not maintained enough liquidity and trying to avail credit period for financing operation.

CASH RATIO:

The cash ratio is a measure of how well a company can cover its current liabilities. 5. The cash ratio is the golden ratio. Since the average ratio for 10 years is 0.20, the Coefficient of Variance is 64.10%, implying a large variation in the sample. It indicates the company's low cash maintenance policy. It implies that the company is availing itself of a long credit period from its suppliers.

Figure 2



Source: Compiled From [www.money control.com](http://www.moneycontrol.com)

The graphic representation of liquidity ratios is from 2008 to 2022. The highest current ratio, liquidity ratio and cash is in 2011. From 2012 to 2019, there are important decreases in these ratios. In 2021, ratio current ratio and liquid ratio recorded the highest level while cash ratio recorded the lowest level and decreasing in 2021.

Conclusions: The hypothesis is tested using regression analysis. We are forecasting the variable using regression analysis. The variable whose value we are predicting is called the dependent variable, and the variable whose value we use to make the forecast is called the independent variable. ROA can be used as a measure of profitability. We wanted to build a working model for the creation and identification of the role of working capital management component on profitability. Based on the analysis of that model, the relationship of the variables can be easily explained. The models are the following:

$$\text{Model 1} \quad \text{RAO} = \beta_0 + \beta_1(\text{CRt}) + \beta_2(\text{WCTRt}) + \epsilon_t$$

Table 5 is the outcome of regression analysis of first model. The value of R (Multiple correlation coefficients) is 0.922 indicating very high degree of linkage between model

variables. The result of R square shows that 92.2% variability in RAO is explained by CR and WCTR. It shows that the favorable relation between RAO and working capital management component.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.922 ^a	.850	.825	1.59807

a. Predictors: (Constant), Current Ratio, Net Working Capital

b. Dependent Variable: Return on Assets

The model summary of the multiple regression analysis in which Net Working Capital (NWC) and Current Ratio (CR) are the independent variables and Return on Assets (ROA) is the dependent variable is shown in Table 5. The goodness of fit R is 0.922, which shows that the relationship between the predicted and observed value of ROA is very strong. The R² is 0.850 which means that together Net Working Capital and Current Ratio account for about 85.0% of the variation in ROA. The adjusted R² is 0.825, which means that about 82.5% of the variance in ROA is accounted for by the model, after the adjustments for the number of predictors and the size of the sample. The standard error of the estimate is 1.59807, which is the average deviation of the observed ROA values from the regression line.

Table 6: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	173.578	2	86.789	33.984	.000 ^b
Residual	30.646	12	2.554		
Total	204.224	14			

a. Dependent Variable: Return on Assets

b. Predictors: (Constant), Currnt Ratio, Net Working Capital

Table 6 presents the ANOVA results and tests whether the regression model as a whole is statistically significant.

The sum of squares for regression is 173.578 . The sum of squares for the residuals is 30.646. So the overall sum of squares is 204.224 . The estimated F-value is 33.984 and the significance value is 0.000.

The significance value is less than 0.05, which indicates that the regression model is statistically significant. This means that Net Working Capital and Current Ratio have a combined statistically significant correlation with Return on Assets.

Therefore, the null hypothesis that there is no significant association between working capital management and profitability is rejected at the 5% significant level.

$$RAO = 10.319 + .001(CR_t) - 10.550(WCTR_t) + \varepsilon_t$$

Table7: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	10.319	1.465		7.046	.000
Net Working Capital	.001	.000	-.859	-7.566	.000
Current Ratio	-10.550	2.336	-.513	-4.516	.001

a. Dependent Variable: Return on Assets

Table 7 shows the individual contribution of Net Working Capital and Current Ratio to Return on Assets. The coefficient of Net Working Capital is 0.001, and the standardized beta coefficient is -0.859 and the t-value is -7.566 and the significance value is 0.000. The significance value is less than 0.05 which means that Net Working Capital is statistically significant in the model. The standardized coefficient is a negative standardized relationship. The Current Ratio coefficient is -10.550 , the standardized beta coefficient is -0.513 , the t-value is -4.516 and the significance value is 0.001. Current Ratio is also statistically significant in its relationship with ROA as 0.001 is less than 0.05. The negative coefficient suggests that the other variable being constant, there is an inverse relationship between Current Ratio and ROA. If only the coefficients listed in Table 7 are used, the regression equation should be:

$$ROA = 10.319 + 0.001(NWC) - 10.550(CR) + \epsilon$$

6. Findings of The Study

The study shows that during the period of study, Power Grid Corporation of India Limited had negative net working capital, i.e., current liabilities were more than current assets. The regression results indicate a statistically significant relationship between working capital management and profitability. The regression results are statistically significant ($F = 33.984$, $p < 0.001$), and the R^2 of 0.850 indicates that Net Working Capital and Current Ratio together explain almost 85% of the variation in Return on Assets (ROA). Net Working Capital is one of the main determinants of ROA. The current ratio was a significant predictor of ROA.

7. Discussion

The results indicate that working capital management is an important factor in the financial performance of Power Grid Corporation of India Limited. Net Working Capital is negatively and significantly related. DFCM has a big negative standardized coefficient ($\beta = -0.859$, $p < 0.001$). The Current Ratio also has a negative statistically significant standardized coefficient ($\beta = -0.513$, $p = 0.001$). This indicates that both working-capital-related variables have significant negative associations with ROA in the estimated model. However, these results represent statistical associations and should not be interpreted as evidence of direct causality. The company's negative working capital position should also be interpreted in the context of its capital-intensive infrastructure business, operating cash flows, supplier-credit arrangements, and financing structure.

8. Conclusion

The study revealed a significant statistical relationship between working capital management and the profitability of Power Grid Corporation of India Limited. The regression model has significant explanatory power, confirming the importance of working capital and liquidity-related variables in explaining variations in ROA during the research period. The company had negative working capital, but that doesn't necessarily mean its financial performance is terrible. But liquidity is important for meeting short-term liabilities and running day-to-day business. The company therefore needs to maintain an appropriate balance between liquidity and profitability.

9. Practical Implications

From a practical perspective, Power Grid Corporation should strengthen its liquidity planning and continuously monitor current assets and current liabilities. Effective receivables management can support timely collection, while efficient cash management can ensure adequate funds for operational requirements without excessive idle balances. The company should also regularly review its short-term liabilities and payment schedules and utilize supplier credit efficiently while maintaining healthy relationships with creditors. Periodic forecasting of cash inflows, outflows, receivables, payables, and short-term financing requirements can help management anticipate liquidity needs. Since Power Grid operates in a capital-intensive sector, working capital planning should also be coordinated with its long-term investment and capital expenditure requirements.

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