



An Empirical Study of Relationship between Working Capital Management and Leverage in Selected Petroleum Companies in India

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Abstract

The main purpose of this article is to find out the relationship between working capital management and leverage of selected petroleum companies in India. The management of working capital and leverage in the business organization has been considered as very crucial part in financial management. Working capital considered as surplus of current assets over current liabilities and leverage considered as firm's ability of employing long term fund having a fixed cost for the purpose of increasing the return of the real owner of the organization. The evaluation of relationship between the two variables and it is identified with the help of parametric test like correlation analysis and one-way ANOVA. The major findings of the study indicated that there is mixed relationship between working capital and leverage position because with the help of correlation analysis Reliance Petroleum, ONGC (Oil and Nature Gas Corporation Limited), IOCL (Indian Oil Corporation Limited), BPCL (Bharat Petroleum Corporation Limited) indicated positive relationship between two variables. GAIL (Gas Authority of India Limited) indicated negative relationship between working capital and leverage during the study period.

Introduction

According to Division (2015-16) The Indian petroleum industry started functioning in very slow pace from Assam's digboi. In Asian countries the major portion of petroleum has been carried out from the North- Eastern part it 1970s. In initial stage the petroleum sponsorship of the industry has been owned or sponsored by government of India. In July 1991, after the LPG Policy (Liberalisation, Privatisation and Globalisation) government of India allowed to private sector to enter in the market. It leads to this sector into tremendous boos later years. In the year 2019, India produced total of petroleum product around 262 million metric tons. With this contest it is important to identify the operation of petroleum industry and how they meet their day to expense and what are the potions in fixed cost expensed in this industry so, working capital management and leverage positions are very helpful to identify the trend in particular industry (Tiwary, 2021).

Further Indian economy is closely related with the demand of energy and with these need for oil and gas are estimated to grow more, it leads to more conductive investment. The government of India adopted number of policies for fulfil and increase in the demand of petroleum products. Government of India also initiated foreign direct investment up 100% in many segments of the sector due to that demand of the petroleum product has been increased in the future period. If market size has been considered for the petroleum industry it gives largest contribution.

As per data released by department of promotion of industry and internal trade policy (DPIIT), The whole natural gas industry attracted FDI (Foreign Direct Investment) worth US \$7.92 billion from April 2000 to March 2021. Government also take initiative for attract the investment in the country like auction of large oil and gas field of state owned ONGC (Oil and Natural Gas Corporation Limited) and oil to boost hydrocarbon production (IBEF, 2021).

Literature Review

According to Shah (2007) Author has carried out the research on Hindalco Industries Limited focusing on the relationship between the components of working capital and its impact on the profitability. The time span of the study was from 1990 to 2007. He concluded that that liquidity ratios such as current ratio, quick ratio and working capital ratios such as receivable turnover ratio and working capital to total assets all had significant impact on the profitability of Hindalco Industries Ltd. A significant portion of the research is concerned with the management of working capital. This issue has been extensively investigated at both conceptual and empirical levels.

According to Zariyawati (2009) have studied on working capital management and corporate performance: case of Malaysia. In this study working capital management has been considered as important financial management decision and also discuss about optimum capital management in give positive result to the organisation. The trade of between liquidity and profitability will have been made by optimum working capital management (Dineshbhai, 2022). In this study panel data have been used for the identification of relation between working capital management and firm's profitability. The time period for this study was 1996 to 2006 for 1628 firms which were listed on Bursa Malaysia. The major finding of this study was reducing cash conversion period results to profitability increase and it also suggested shorten cash conversion cycle will increase profitability.

While SEN (2010) has analysed the relationship between efficiency level of working capital management and return on total assets in Ise. In this study researcher tyre to identify the relationship between efficiency levels of firm being traded in Istanbul Stock Exchange in working capital and its return on total assets. In this study research get the findings based on two models. With the help of two models they get the findings that all the firms involved in the study were significant negative relationship between cash conversion cycle, net working capital level, receivable period, current ratio, inventory ratio and return on total assets.

According to Daniel (2013) have analyzed working capital management and firm profitability: empirical evidences from manufacturing and construction firms listed on Nairobi securities exchange. The study has been carried out for the time period of 2003 to 2012. For the purpose of analysis of the data balanced panel data technique used for the five manufacturing and construction firm which are listed on Nairobi Securities Exchange. Pearson's correlation has been used as statistical tool the major finding of the study indicated that there is negative relationship between profitability and number of day's account receivables as well as cash conversion cycle but there is also positive relationship between profitability and number of days of inventory and number of day's payables.

According to Oladipupo (2013) have studied on relative contribution of working capital management to corporate profitability and dividend payout ratio: evidence from Nigeria. In this paper indicated good working capital management gives higher profitability to the organisation and implication of working capital management practice on dividend payout ratio of firm. The main focus of this study was effects of working capital management on profitability and dividend payout ratio. Date was taken from twelve manufacturing companies

listed on Nigerian Stock Exchange for the time period of five years which was 2002 to 2006. The major finding of the study was shorter net trade cycle and debt ratio promotes high corporate profitability to the organisation and level of leverage has negative significant impact on corporate profitability.

According to Kamal (2013) have analysed factors influencing corporate working capital management: evidence from emerging economy. For this paper cash conversion cycle have been used for working capital management, there are six factors are impacted in working capital management like industry type, sales growth, operating cash flow, return on equity, leverage and size. For this study all the companies were listed on stock exchange have been considered from which its last year financial statement considered. The major findings of the study have been indicated that working capital management effected on sales growth, size and level of corporate leverage.

According to Jayarathne (2014) has analyzed impact of working capital management on profitability: evidence from listed companies in Sri Lanka. This research work was based on time duration of 2008-2012 on listed companies which are listed on Colombo stock exchange for the purpose of analysing impact of working capital management on profitability. The major finding of the study has been indicated that profitability negatively associated with the account receivables period, inventory turnover period and cash conversion cycle where as it is positively associated with account payable period.

According to Michael (2016) have analyzed the effect of leverage and liquidity on earnings and capital management: evidence from U.S. commercial banks. For the study researcher has analyzed selected commercial banks during the study period of 1999 to 2013. In this paper researcher realised that earnings and capital management measures consistently have a significant positive relation with the selected liquidity ratios in concern with earning management.

According to Ama (2017) have analysed the impact of working capital management on firm value: evidence from a frontier market. With this study researcher analyzed 44 listed companies on the Colombo stock exchange during the period of 2011 to 2015. For the study cash conversion cycle helpful for the working capital management and for the firm value Tobin Q ratio has been used. There are mainly three control variable like firm size, leverage and growth rate. The major suggestion of the study indicated as manager can create shareholders value by managing investment in working capital with efficiently.

According to Ilhan (2018) in this article authors have analysed working capital management policy in health care: the effect of leverage. Researchers have analysed that hospitals have required more financial resources for giving best quality services. In this research 52 hospitals and 468 observations were analyzed in concern with working capital management and profitability. As statistical tool regression analysis has been used for reaching to the conclusion. The major findings so the paper indicated that the degree of financial leverage is an important indicator to be taken into note for the health care sector and policy managers in working capital management. With the help of this research work manager also take decision regarding the cash conversion cycle for improve hospital profitability.

According to Rizqi (2018) have analyzed the effect of working capital, leverage, and firm size towards corporate performance with liquidity SS moderating variables. For this research work 29 companies listed on IDX in the category of LQ45 have been used during the period of February 2013 to February 2016. Multiple linear regression model with path analysis has been used for the data analysis and as a statistical tool. The major findings of the study are indicated

that working capital has positive impacted on corporate performance. Leverage has not been affected on corporate performance whereas liquidity as moderating variable indicated strengthen the effect on working capital.

According to Baskar (2019) has analysed liquidity management of selected tyre companies in India – An analysis. In this paper researcher identified that liquidity is one of the crucial factors to determine the short-term investment decision of shareholders fund in the organisation. In this study secondary data has been used and collected from published annual report of selected companies. The time period of the study was 2008-09 to 2017-18. For the analysis of data research used accounting tools as well as statistical tools like ratio analysis and mean, standard deviation and coefficient of correlation.

According to Ajmera (2019) The analysis has been made on tyre industry and the major findings was from the selected companies MRF Tyres Ltd. Balkrishna Industry Ltd., Apollo tyre indicated good liquidity position. In the year 2016-17 to 2017-18 the entire tyre companies indicated slightly down of financial position out of selected study period.

This study helps in overall industrial sector whether it is manufacturing or services providing. It contributes to existing knowledge of relationship between working capital and leverage, based on that managerial decisions will have been taken by management. It will also useful to government, potentials shareholders and stakeholders of the companies.

Methods

The following research methodology has been used for the identification of relationship between working capital management and leverage in petroleum industry. The functional scope of the study represents area of working capital management and leverage position in selected companies. The relationship between working capital management and leverage also examine in the study. The geographical scope of the study is whole over India because selected companies are providing their services to whole over India.

The study of all petroleum companies has limitation of time and other aspect due to that researcher selected best representative sample from the all petroleum companies based on higher market capitalisation. The nature of data for the study is secondary source in which published financial reports, published material for selected companies, newspapers, research papers have been considered.

Results and Discussion

Leverage Analysis

Table 1. Operating Leverage

Year	Reliance	ONGC	IOCL	BPCL	GAIL
2014-15	1.54	2.85	4.10	3.08	2.02
2015-16	1.62	2.88	2.75	2.29	2.04
2016-17	1.32	2.69	1.86	1.63	1.62
2017-18	1.31	2.59	2.12	2.27	1.47
2018-19	1.32	2.40	2.40	2.42	1.39
Mean	1.42	2.68	2.65	2.34	1.71
Max.	1.62	2.88	4.10	3.08	2.04
Min.	1.31	2.40	1.86	1.63	1.39

Above table indicated operating leverage for selected companies for the study period of 2014-15 to 2018-19. Reliance indicated average of 1.42 operating leverage during the study period.

It was lowest from selected samples. The minimum and maximum operating leverage for reliance was 1.31 and 1.62 in the year 2017-18 and 2015-16 respectively. ONGC indicated near about stable trend during the study period. The maximum and minimum ratio was 2.88 and 2.40 for the year 2015-16 and 2018-19 respectively. IOCL indicated fluctuating trend with concern to study period in which average ratio was 2.65 and maximum and minimum ratio was 4.10 and 1.86 in the year 2014-15 and 2016-17. BPCL indicated first three-year decreasing trend and later on it increased remaining two years. The average ratio of BPCL was 2.34 and minimum and maximum ratio was 3.08 and 1.63. GAIL indicated decreasing trend during the study period and average ratio was 1.71 during the study period.

Table 2. Financial Leverage

Year	Reliance	ONGC	IOCL	BPCL	GAIL
2014-15	1.08	1.00	1.43	1.08	1.08
2015-16	1.07	1.06	1.18	1.05	1.20
2016-17	1.07	1.05	1.13	1.04	1.09
2017-18	1.10	1.05	1.11	1.07	1.04
2018-19	1.21	1.06	1.17	1.13	1.02
Mean	1.11	1.04	1.20	1.07	1.09
Max.	1.21	1.06	1.43	1.13	1.20
Min.	1.07	1.00	1.11	1.04	1.02

Above table indicated financial leverage of selected companies. Overall it was indicated same performance in financial leverage in selected companies. For Reliance the average ratio was 1.11 and minimum and maximum ratio was 1.21 and 1.07 in the year 2018-19 and 2015-16 respectively. For ONGC, IOCL, BPCL and GAIL average ratio was 1.04, 1.20, 1.07 and 1.09 respectively. During the selected study period 2014-15 to 2018-19, within the companies not any note changes have been recorded.

Table 3. Combined Leverage

Year	Reliance	ONGC	IOCL	BPCL	GAIL
2014-15	1.66	2.85	5.86	3.33	2.18
2015-16	1.73	3.05	3.25	2.40	2.45
2016-17	1.41	2.82	2.10	1.70	1.77
2017-18	1.44	2.72	2.35	2.43	1.53
2018-19	1.60	2.54	2.81	2.73	1.42
Mean	1.60	2.80	3.27	2.52	1.87
Max.	1.73	3.05	5.86	3.30	2.45
Min.	1.41	2.54	2.10	1.7	1.42

Above table indicated combined leverage of selected companies during the study period. From the selected companies IOCL indicated higher average leverage which was 3.27 and reliance indicated lower average leverage as 1.60 during the study period. Combined leverage indicated use of fixed nature financial sources in the capital structure. In the year 2014-15 IOCL possess 5.86 ratio of combined leverage and BPCL indicated 1.70 as lowest ratio. Reliance and BPCL indicated fluctuating trend whereas ONGC demonstrate decreasing trend during the study period.

Working Capital Management Analysis

Table 4. Current Ratio

Year	Reliance	ONGC	IOCL	BPCL	GAIL
2014-15	1.27	1.57	0.99	0.93	1.06
2015-16	0.72	1.72	0.88	0.89	0.99
2016-17	0.70	1.55	0.72	0.79	1.09
2017-18	0.65	0.44	0.76	0.83	1.02
2018-19	0.76	0.61	0.81	0.99	1.10
Mean	0.82	1.178	0.832	0.886	1.052
Max.	1.27	1.72	0.99	0.99	1.1
Min.	0.65	0.44	0.72	0.79	0.99

Above table indicated current ratio of selected companies during the study period. Current ratio indicated portion of current assets to current liabilities and it also suggest positive or negative working capital during the year. The standard current ratio is 2:1 which is indicated portion of 2 current assets against 1 current liability. In concern with average current ratio ONGC and GAIL have satisfied the near about standard norms of current ratio which was 2:1 but no one company has satisfied perfect standard ratio. Overall ONGC and GAIL indicated surplus amount of current assets over current liabilities or it can be said that positive working capital whereas Reliance, IOCL and BPCL have not able to meet its current liabilities with the help of current assets.

Table 5. Quick Ratio

Year	Reliance	ONGC	IOCL	BPCL	GAIL
2014-15	0.87	1.26	0.52	0.48	0.85
2015-16	0.50	1.41	0.40	0.45	0.83
2016-17	0.47	1.23	0.24	0.33	0.89
2017-18	0.44	0.30	0.28	0.36	0.83
2018-19	0.54	0.44	0.35	0.53	0.86
Mean	0.564	0.928	0.358	0.43	0.852
Max.	0.87	1.41	0.52	0.53	0.89
Min.	0.44	0.3	0.24	0.33	0.83

Above table indicated quick ratios of selected companies during the study period. Quick ratio indicated those assets which can be converted into cash instantly. The standard quick ratio is 1:1 which indicated equal quick assets to the quick liabilities. From the selected companies ONGC has satisfied the standard norm hardly in concern with average quick ratio. ONGC and GAIL indicated good performance in quick ratio after that Reliance, BPCL and IOCL possess their position as rank wise. 1.41:1 was highest ratio from selected companies which was possessed by ONGC and 0.24:1 was lowest ratio from selected companies which was indicated by IOCL.

Table 6. Inventory Turnover Ratio

Year	Reliance	ONGC	IOCL	BPCL	GAIL
2014-15	9.00	13.90	9.61	16.47	27.27
2015-16	8.32	13.78	8.96	13.82	29.75
2016-17	7.11	12.60	5.78	10.21	28.35

2017-18	7.33	12.70	6.49	11.33	27.96
2018-19	8.42	14.14	7.38	13.80	32.36
Mean	8.036	13.424	7.644	13.126	29.138
Max.	9	14.14	9.61	16.47	32.36
Min.	7.11	12.6	5.78	10.21	27.27

Above table indicted inventory turnover ratio of selected companies during the study period of 2014-15 to 2018-19. Inventory turnover ratio indicated relationship between sales and inventory. The highest average ratio of inventory turnover was 29.14 times and lowest ratio was 8.036 times during the study period. GAIL indicated good result in concern with inventory turnover ratio because it indicated highest ratio of 32.36 times in the year 2018-19 and Reliance indicated lowest ratio of inventory turnover ratio which was 7.11 times in the year 2016-17 that means GAIL conversion cycle of cash is bigger than Reliance. It also identified that GAIL consist good working capital cycle whereas Reliance consist poor working cycle as compare to selected samples.

Hypotheses Testing

Table 7. ANOVA Test

Name of Ratio	<i>f – cal.</i>	<i>p- value</i>	<i>f-crit.</i>	Result
Current Ratio	1.3568	0.2841	2.8660	H_0 fail to reject
Quick Ratio	5.0578	0.0055	2.8660	H_0 Rejected
Inventory Turnover Ratio	138.628	2.8E-14	2.8660	H_0 Rejected
Operating Leverage	6.7709	0.0012	2.8660	H_0 Rejected
Financial Leverage	3.4244	0.02747	2.8660	H_0 Rejected
Combined Leverage	4.1443	0.01322	2.8660	H_0 Rejected

Above table indicated Anova test result for the selected ratios during the study period. Out of selected ratios Current ratio has been indicated there is no significant difference between current ratio of selected companies that means potion of current ratio in selected companies are same at 5% level of significant. *p-value* of current ratio is also more than 0.05 so it also said that researcher has not sound statistical evidence that can reject H_0 . Other all the ratio like quick ratio, inventory turnover ratio, operating leverage ratio, financial leverage ratio, combined leverage indicated significant difference between the selected companies.

Table 8. Correlation Analysis

	Reliance		ONGC		IOCL		BPCL		GAIL	
	C.R.	C.L.	C.R.	C.L.	C.R.	C.L.	C.R.	C.L.	C.R.	C.L.
C.R.	1		1		1		1		1	
C.L.	0.452	1	0.820	1	0.955	1	0.751	1	-0.590	1

*(C.R. = Current Ratio, C.L. = Combined Leverage)

Above table indicated Correlation analysis of selected companies and compare the relationship of working capital management and leverage during the study period. In reliance the correlation indicated 0.45 which means there is partial positive relationship between two variables. ONGC and IOCL indicated moderate strong positive relationship between working capital ratio as current ratio and leverage ratio as combined leverage ratio because former indicated 0.820 and letter indicated 0.955. BPCL indicated moderate strong positive correlation out of selected GAIL was one of the companies which indicted negative correlation as -0.590 that means in this company the relationship between working capital and leverage was inverse.

The positions of operating leverage in selected companies are ranged as 1.42 to 2.68 during the study period. Financial leverage of selected companies is ranged as 1.04 to 1.09 which indicated the use of fixed expensed source of fund in capital structure are same in selected companies and with the help of this, they benefited in making profits. In concern with combined leverage IOCL has possessed higher combined average leverage as 3.27 during the study period. Current ratios of selected companies indicated not proper management of current assets in concern with its current liabilities because no one company satisfied the standard norm in current ratio which is 2:1 and ONGC has indicated higher current ratio as 1.19:1 during the study period. The position of quick ratio in selected companies also not good except ONGC, as per standard because no one company satisfied standard norm 1:1 in current ratio. Inventory Turnover ratios of GAIL has highest average ratio during the study period. BPCL is second highest out of selected companies.

Conclusion

With the help of this study researcher conclude that there is mix trend of working capital management relationship with leverage in selected petroleum companies because some companies indicated strongly positive relationship between selected two variables where as some indicated negative relationship between two variables.

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