

Liquidity Management of Selected Crude Oil and Natural Gas Companies in India

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Abstract

This research work observes the liquidity position and its management of crude oil and natural gas companies in India and at the same time investigates the liquidity management and profitability relationship. The profitability of crude oil and natural gas companies in India has been decreased year after year due to poor utilisation of production capacity, increase in consumption, increase in import value and incurring huge foreign currencies. Poor liquidity management might be a cause because both insufficient liquidity and additional liquidity unswervingly influence profitability. This research is based on secondary data obtained from Centre for Monitoring Indian Economy data for the periods from 1994 to 2013 using descriptive statistics and multiple regressions. Descriptive statistics point out that liquidity position is acceptable in case of ONGCVL, OIL and SETL but their overall liquidity management are not good every year. Multiple regression test results signify that profitability and liquidity management indicators are associated, but questionable in the case of liquidity efficiency indicators, that is, management of inventory, credit policy and payment policy.

Keywords

Liquidity Management Ratios, Profitability, Crude Oil and Natural Gas Companies, India, Multiple Regressions

1. Introduction

Liquidity management plays an important role in the growth and profitability of any firm. Liquidity management is the practice of managing finances in a way that allows organizations to meet their financial obligations and accomplish their mission. For this, every firm should have optimum level of liquidity because excess liquidity impairs profitability and lack of liquidity interrupt the business operations that ultimately affect the profitability. Liquidity management establishes noticeably the size of profit with the aim of upshots and the worth of shareholders assets (Ben-Caleb, 2009). Padachi (2006) suggested that a company is obligatory to uphold equilibrium between liquidity position and its management with its profitability since both insufficient liquidity and additional liquidity unswervingly influence profitability.

Crude oil and natural gas companies is pulled out for enquiry in this research where the production of crude oil and natural gas companies in India is not so steadily progressed what it desires for the country. Consequently, the import

value of the country for these items have been augmented steadily in which Indian economy has been influenced negatively. In spite of the fact that India has huge amount of reserve of crude oil and natural gas, India depends much on import of oil and natural gas from different countries. Because the domestic production is much lower than the domestic consumption of oil and natural gas. As a result India has to incur huge amount of foreign exchange to import required amount of crude oil and natural gas. Now, India is one of the leading end user of oil and natural gas during the globe, ranked as 4th just after US, China and Japan. Share of crude oil and natural gas in primary energy consumption is currently 40.3%, which is second to coal. Currently India has 0.4% of the estimated reserves of crude oil but consumes around 2.8%. With the betterment of the economic condition of the citizen of India, people are consuming more power for different purposes. The consumption of energy is growing around 3.6% per year as compared to 2% grow in the world (natural gas statistics, 2013).

Therefore, due to poor utilisation of production capacity, increase in consumption, increase in import value and incurring huge foreign currencies, profitability of the crude

oil and natural gas companies in India has been decreased steadily. It is obvious that liquidity management may be questionable. Keeping in view of this, this research work investigates the liquidity position and its management of crude oil and natural gas companies in India.

2. Literature Review

A concise check of the diverse endeavours of research in this pasture is stabbed in the subsequent snippets. Agarwal (1988) investigated the working capital decision giving primary importance to the liquidity management through a few liquidity and profitability ratios. Above all, the profitability constrictions were designed to confine the opportunity cost of excess liquidity in terms of reduced profitability. Rafuse (1996) suggested that stock reduction generates system-wide financial improvements and other important benefits based on suitable stock management strategies. Ghosh and Maji (2003) examined the efficiency of working capital management of Indian cement companies for twelve years between 1993 and 2002 with the application of performance index, utilization index and overall efficiency index instead of using working capital management ratios. They found that some of the sample firms successfully improved efficiency during these years. Jafar and Sur (2006) examined the efficiency of the working capital management in the National Thermal Power Corporation (NTPC) and exhibited that the company achieved a higher level of efficiency in managing its working capital during the post-liberalization era by adapting itself to the new environment which had emanated from liberalization, globalization and competitiveness. Empirical results illustrate that while many of the public enterprises are learning to survive and grow by adapting themselves to the fresh condition and a big faction of public sector enterprises have been inundated with stern dilemmas akin to sluggish growth, low productivity, insufficient weight on research and progress and unproductive management of working capital. Lazaridis and Tryfonidis (2006) conducted a cross sectional study by using a sample of 131 firms listed on the Athens Stock Exchange for the period of four years from 2001 to 2004 and found statistically significant relationship among profitability, gross operating profit and cash conversion cycle and its components. On the basis of the analysed annual data by using correlation and regression tests, they conclude that managers can create profits for their companies by correctly handling the cash conversion cycle and by keeping each component of the conversion cycle at an optimum level. Garcia-Teruel et al (2007) analysed the effects of working capital management on SME profitability using the panel data of 8872 small to medium-sized enterprises for a period of seven years from 1996 to 2002. They concluded that managers could make value by reducing their inventories and the number of days for which their accounts are stupendous. In addition, shorter cash conversion cycle also improves the firm's profitability. Chakraborty (2008) investigated the relationship between working capital and profitability of Indian pharmaceutical companies based

on two distinct schools of thought on this issue. The first thought explains that working capital is not a factor of improving profitability and there may be a negative relationship between them, and the other school of thought described investment in working capital plays an important role to improve corporate profitability and if not there is a smallest echelon of investment of working capital, output and sales cannot be maintained. In fact, the inadequacy of working capital would keep fixed asset inoperative. Singh (2008) found that the size of inventory directly has an impact on working capital and its management. He pointed out that inventory was the major component of working capital as well as obligatory to be cautiously guarded. Singh and Pandey (2008) suggested that fixed and current assets play a pivotal role for the flourishing working of any business organization and the management of working capital is essential as it has a direct impact on profitability and liquidity. They investigated the working capital components and found a significant impact of working capital management on profitability for Hindalco Industries Limited. Bhunia and Bramha (2009) investigated the reason for low profitability and relationship between liquidity and profitability of seventeen selected steel companies in India using secondary data for a period of nine years from 1997-98 to 2005-06 using multiple correlation and multiple regression analysis. They concluded that higher degree of multiple correlations implying the presence of some explained variables that have led to lower profitability over and above lower liquidity, are in action for all the selected companies. Mathuva (2009) explored the shock of liquidity management components on corporate profitability by using a sample of 30 firms listed on Nairobi Stock Exchange for the periods from 1993 to 2008 using correlation statistics, the pooled regression and the fixed effects regression models to conduct data analysis. He concluded that there exists a highly significant negative relationship between the debt collection period and profitability and a highly significant positive relationship exist between the period taken to convert inventories to sales and profitability furthermore there exists a highly significant positive relationship between the time it takes for firms to pay its creditors and profitability. Virambhai (2010) examined the financial position and its performances in terms of productivity and efficiency of the selected textile industry based on secondary data. He explained that the companies under the study should attempt to enhance its production, curb its cost and operating expenses, implement suitable liquidity. Bhunia (2010) analysed the trend analysis of liquidity management efficiency in selected private steel companies in India for the period from 1998 and 2006 based on secondary data obtained from the annual reports of the selected companies with the application of least square trend, trend indices, and chi-square test. The study suggests that inventory management is required to be progressed by way of JIT, EOQ, ABC analysis and proper management of sales. Besides, the study puts forward that management of receivables is also required to be improved by way of effective professional coordination between Sales Production

and finance department. On time billing, timely reminder to defaulting customer and immediate action on non-payment customer. Singh and Bansal (2010) observed the working capital management based on secondary data of the IFFCO and KRIBHCO using financial ratio analysis, t-test and working capital cycle analysis etc. They wrapped up that each and every sector should ponder on their liquidity and proper utilization of working capital and contemplate working capital management, triumphs and profitability weighs up. Mittal et al (2010) examined the trends in working capital management of the cement industry in India. He studied a sample of two companies namely Gujarat Ambuja Cements Ltd and Associated Cement Companies Limited considering the market leaders and principal competitors for the period of four years from 2006 to 2009 using secondary data that was collected from the company balance sheets to understand the size of the working capital in the cement industry in India and find trends in the working capital management in the industry. The different variables studied were sales, total assets, and net profit. This is a descriptive study based on case study methodology of the Indian cement industry. The various statistical tools like descriptive statistics, correlation statistics and linear regressions were used. They wrapped up that there was an inconsequential relation between the sizes of the working capital of the firms. The other conclusion was that there exists a noteworthy association between the components of working capital and profitability. The last conclusion based on the comparison was that the cement industry in India was not upholding sufficient amounts of working capital as well. Khawaja et al (2011) investigated the dependence of profitability on the management of working capital based on a sample of 332 listed manufacturing companies was taken for a period of 5 years between 2006 and 2010 using panel data methodology. Empirical results indicate that short-term liquidity affects profitability of firms to continue its effect on neutral current ratio which was used as the control variable. Size of firm affects profitability to remain size as constant factor where natural logarithm of sales was used as control variable. Financial assets in the short-period are used to obtain short term profits, these assets diverge company to company. With the intention of carry on its nonaligned effect, financial assets to company's total asset ratio was used as control variable. To keep the debt utilization effect constant debt to asset ratio was taken as control variable. Saleem and Rahman (2011) examined the relationship between liquidity and profitability of selected 26 oil and gas companies of Pakistan listed in Karachi Stock Exchange for the period from 2004 to 2009 based on secondary data. Empirical results illustrate that liquid ratios affect the profitability ratios in a significant way. Bhunia and Khan (2011) examined the association of liquidity management or working capital management and profitability of the private sector steel companies in India. The main objectives of the authors were to swot up the overall efficiency of management of short term liquidity and its relation to profitability based on 230 steel companies in the private sector of the Indian industry

and studied them over a period of eight years i.e. from 2002 to 2010, using different liquidity and solvency ratios. After doing multiple regression analysis, Correlation analysis and Descriptive statistics, the authors concluded that liquidity and solvency position in terms of debt is very satisfactory and relatively efficient liquidity management is found but liquidity position has no impact on profitability. Kulkarni (2011) examined the twin objectives of liquidity and profitability of the firm by analyzing the effect of working capital management on profitability of Bharat Petroleum Corporation Ltd and also study the working capital leverage effect on profitability based on five years period between 2005 and 2010 collected from secondary sources with the application of statistical techniques. The effect of leverage used was measured through the working capital leverage has been used. They concluded that there was a negative association between the profitability and the current ratio of the company and the correlation coefficient is found to be statistically significant. In addition they established that there was a negative correlation between the profitability of the company and the ratio of current assets to total assets and hence had a significant impact on the profitability of the firm. Bhunia et al (2011) investigated the effectiveness of short term liquidity as well as the association between liquidity management and profitability of the private sector steel companies in India for the period between 1997-2006 based on secondary data obtained from CMIE database and their annual reports with the application of descriptive statistics, co-relation statistics and linear regression methods. The fundamental findings exemplify that liquidity position is very much satisfactory in case of Tata Steel and Kalyani Steel Ltd. But it is not satisfactory in case of other selected companies under the study. Linear regression tests results confirm that liquidity management indicator is closely associated with profitability of the Indian steel companies. Zahid and Nanik (2011) examined the financial performance of the textile sector based on secondary data with the help of different accounting ratios. They wrapped up those financial indicators such as management of inventory, management of receivables and payables, efficiency and fixed assets were negatively influenced by financial crisis. Kumar (2011) explained the export import performance of the Indian textile industries in the midst of inflation, textile production, sales income, PAT. He concluded that the export and import performance in the crisis period of the Indian textile industries are not sound because of inflation. Bhunia and Khan (2011) examined the liquidity management efficiency of 230 Indian private sector steel companies to identify the liquidity position and also examined whether the liquidity management indicators is related with its profitability or not over the period from 2002 to 2010 based on secondary data collected from CMIE database with the application of appropriate statistical tests. Descriptive statistics disclose that liquidity and solvency position is very satisfactory but relatively proficient liquidity management is endured. Linear regression test results exemplify a lower degree of association between the liquidity management and profitability. Bhagchi

and Kamrui (2012) observed the upshot of working capital management on profitability on the FMCG sector in India. The study was conducted on a selected ten FMCG firms over a period of ten years 2000-01 to 2009-10. The objective of the study was to understand the impact of working capital management on profitability and to analyse the impact of various components of working capital management on profitability. After accomplishing normality tests, Pearson's correlation and panel data regression, the authors concluded that there was a significant negative relation between working capital management and firm profitability. Manjhi and Kulkarni (2012) investigated the working capital position of five selected textile companies of Gujarat for a period of eleven years with the help of ratio analysis, descriptive statistics etc. The study demonstrated that all the companies under the study working capital position and company's financial performance are good as well as efficient. Arora (2013) made an attempt to show the impact of negative working capital on profitability of Hindustan Unilever Ltd. from 2007 to 2012. He concluded that, even with the negative working capital the company's sales, net profit and operating profit had shown positive growth which indicate that company had done well and profitability is not adversely affected by the negative capital. Gurupandi (2013) analysed the liquidity and leverage performance of BPCL and RIL for the period from 2007 to 2011 based on secondary data obtained from the annual reports of the respective companies using descriptive statistics, growth rate, and multiple regression analysis. Descriptive statistics signify that the liquidity position is weak in case of BPCL. The study also confirm that growth rate of BPCL is high despite of the low liquidity. Ben-Caleb et al (2013) observed the relationship between liquidity management and profitability of selected manufacturing companies in Nigeria listed on the Nigeria stock exchange using secondary data between 2006 and 2010 with the application of descriptive statistics, co-relation statistics and multiple regression tests. The empirical results make obvious that liquidity position in terms of current ratio and liquid ratio are positively related with profitability but the important liquidity indicator cash conversion period is negatively associated.

2.1. Research Gap

It is very much clear from the above literature review that we are getting mix observations about the liquidity and profitability positions of different companies. In some cases we have observed that companies with sound liquidity positions, that is, having positive working capital positions and they are doing well in terms of profitability. However in a few cases we have examined that inspite of having negative working capital they are doing well in terms of profitability. That's means they are not at all liquid firm, still they are earning huge amount of profit. It is also fact that no such study has been conducted on crude oil and natural gas companies of India. The present chapter will show the liquidity positions and working capital management status of the companies under the study.

2.2. Objectives of the Study

This study examines the following issues:

- (i) To survey the liquidity position using liquidity ratios and vicinity of drawbacks;
- (ii) To investigate the liquidity-profitability relationship.

Hypotheses of the study

The present research paper considers the following research hypotheses:

H₁: liquidity position and its management are very much satisfactory.

H₂: liquidity and profitability are associated significantly.

3. Materials and Methods

3.1. Data Sources and Variable Used

This study considers eight financial ratios in terms of secondary data collected from Centre for Monitoring Indian Economy prowess database. Financial ratios include current ratio (CR), quick ratio (QR), cash position ratio (CPR), debt-equity ratio (DER), stock turnover ratio (STR), debtors turnover ratio (DTR), creditor turnover ratio (CTR) and return on capital employed (ROCE). In this study, return on capital employed has been used as profitability ratio, which is a dependent variable and other seven financial ratios have been used as liquidity ratios, that is, seven independent variables.

3.2. Sample Companies

This study purposively selects six crude oil and natural gas companies in India. These are Hindustan Oil Exploration Company Ltd (HOECL), Oil and Natural Gas Corporation Videsh Ltd (ONGCVL), Oil and Natural Gas Corporation Limited (ONGCL), Oil India Limited (OIL), Selan Ltd (SETL) and Tata Petrodyne Ltd. (TPL). Out of these, three public sectors and three private sector companies in India.

3.3. Period of the Study

The liquidity management performance of the crude oil and natural gas companies in India has been considered for 20 years between 1994 and 2013. Twenty years has been taken with the intention that this research work is significant in spotlighting the awareness on the constitutional changes of accounting and finance in the mining industry.

3.4. Tools Used

Whilst studying the data, descriptive statistics and linear regression techniques have been used. To test the hypotheses, t-test has utilised in this study. Correlation statistics are not used because correlation only indicates the strength and direction of two variables association but it does not talk about any cause and effect of the association between two variables.

4. Results and Discussion

Liquidity position and its management play an important role in the growth and profitability of any firm. Either excess or inadequate liquidity may create problem for the smooth operation of the firm. Generally current ratio, quick ratio, debt-equity ratio, inventory turnover ratio, debtors turnover ratio and creditors turnover ratio, cash to average daily cost of sales (in days), operating cash flow to sales are very useful in ascertaining the short-term debt-paying ability or liquidity of a concern and its management.

4.1. Descriptive Statistics of Current Ratios

Current ratio is an assessment of overall liquidity and is basically used to make the interpretation of liquidity of firm in the short-run. A relatively high current ratio is a pointer that the firm has huge liquidity and has the ability to pay the matured obligation in time. Table 4.1 shows the descriptive statistics of current ratio of selected crude oil and natural gas companies in India.

Table 4.1. Descriptive Statistics of Current Ratios.

	HOECL	ONGCVL	ONGCL	OIL	SETL	TPL	Ind. Average
Mean	1.29	2.17	0.77	2.42	3.61	1.33	2.10
Maximum	3.51	8.08	2.20	3.70	9.38	3.61	3.38
Minimum	0.28	0.22	0.33	1.44	1.35	0.42	1.17
Std. Dev.	0.95	2.44	0.5	0.66	2.25	0.89	0.70
C. V. (%)	73.64	112.44	64.93	27.27	62.33	66.92	33.333
Skewness	1.16	1.47	1.61	0.26	1.52	1.35	0.46
Kurtosis	3.19	3.72	4.51	2.01	3.97	3.76	-1.08
Observations	20	20	20	20	20	20	20

Mean of HOECL, ONGCL and TPL are unsatisfactory as its averages are very much lower than grand industry average (2.10) that is taken as benchmark. This indicates that the general liquidity position is poor and they have not capable to meet up their current obligations in time. Again, a satisfactory current ratio is seen in ONGCVL, OIL and SETL because mean of current ratios of those companies are higher than grand industry average that points out those companies are able to meet their matured obligations in time. Coefficient of variation of the ratio as a whole is 33.33%. In the matter of the liquidity management, it furthermore exhibits reliability as lower variability confirms more reliability in case of OIL (27.27%). But coefficient of

variation of current ratio is much more than grand industry average of all other selected companies under study, which exhibits less reliability in the matter of liquidity management.

4.2. Descriptive Statistics of Quick Ratios

Quick ratio is more specific test of liquidity than current ratio. A high quick ratio is an indication that the company has liquidity and ability to meet its current liabilities in time. But a low quick ratio represents that liquidity position of the company is not good. Quick ratios of crude oil and natural gas companies under the study are portrayed in table 4.2.

Table 4.2. Descriptive Statistics of Quick Ratios.

	HOECL	ONGCVL	ONGCL	OIL	SETL	TPL	Industry Average
Mean	1.18	2.18	0.60	2.19	3.29	1.04	2.0
Maximum	3.51	8.39	1.55	3.46	8.96	3.47	3.59
Minimum	0.28	0.20	0.27	1.03	1.03	0.34	1.07
Std. Dev.	0.98	2.52	0.37	0.79	2.13	0.72	.79
C. V. (%)	83.05	115.6	61.67	36.07	64.74	69.23	39.5
Skewness	1.23	1.48	1.51	0.29	1.53	2.04	.65
Kurtosis	3.36	3.77	4.36	1.61	4.19	7.43	.79
Observations	20	20	20	20	20	20	20

Mean of HOECL, ONGCL and TPL are unsatisfactory as its averages are lower than grand industry average (2.00) that is taken as benchmark. This indicates that the liquidity position is poor and they have not capable to meet up their current obligations in time. Again, a satisfactory quick ratio is seen in ONGCVL, OIL and SETL because mean of quick ratios of those companies are higher than grand industry average that shows those companies are able to meet their matured obligations in time. Coefficient of variation of the ratio as a whole is 39.50%. In the matter of the liquidity management, it additionally displays consistency as lower variability confirms more consistency in case of ONGCL

(27.27%). But coefficient of variation of quick ratio is much more than grand industry coefficient of variation of all other selected companies, which exhibits less consistency in the subject of liquidity management.

4.3. Descriptive Statistics of Cash Position Ratios

Cash and cash equivalent is the most liquid asset. Cash position ratio is further perfect analysis of liquidity than current and quick ratio. It is meticulous as most useful indicator to test the unconditional liquidity position of any

organisation. In determining the cash, inventories and accounts receivable are deducted from current assets. This

ratio of selected six oil and natural gas companies is shown in table 4.3.

Table 4.3. Descriptive Statistics of Cash Position Ratios.

	HOECL	ONGCVL	ONGCL	OIL	SETL	TPL	Industry Average
Mean	1.00	1.31	0.26	1.37	1.95	0.74	1.33
Maximum	3.42	7.98	0.55	3.10	7.88	2.78	3.17
Minimum	0.16	0.02	0.02	0.11	0.17	0.21	.48
Std. Dev.	0.92	2.08	0.13	1.01	2.12	0.58	.78
C. V. (%)	92.00	158.78	50	73.72	108.72	78.38	58.65
Skewness	1.26	2.04	0.13	0.46	1.72	2.16	1.20
Kurtosis	3.60	6.42	3.18	1.67	4.93	8.44	.52
Observations	20	20	20	20	20	20	20

Mean of HOECL, ONGCL and TPL are unsatisfactory as its averages are very much lower than grand industry average (1.33) that is taken as benchmark. This designates that the liquidity position is poor and they have not competent to congregate their current obligations in time. Again, a satisfactory cash position ratio is seen in ONGCVL, OIL and SETL because mean of cash position ratios of those companies are higher than grand industry average that points out those companies are capable to meet their matured obligations in time. Coefficient of variation of the ratio as a whole is 58.65%. In the matter of the liquidity management, it still displays trustworthiness as lower variability confirms more trustworthiness in case of ONGCL (27.27%). But coefficient of variation of cash position ratio is much more than grand industry coefficient of variation of all other selected companies, which reveals less trustworthiness in the issue of liquidity management.

4.4. Descriptive Statistics of Debt-Equity Ratios

Short-term debt-equity ratio is an indicator of liquidity position and also important for dependability of financial position as well as financial policies in a short period of the firm. It measures the direct proportion of debt capital to equity capital. It is a proportion of outside liabilities and tangible net worth relating to short period of the company. It also indicates the proportion of owners' stake in the business. In other words, this indicates the amount to which the firm depends upon outsiders for its survival. The ratio provides a margin of safety to the creditors. If the ratio is over 100%, it indicates a highly geared company and any prudent lender will not be will to extend loan finance to such business. Debt-equity ratios of selected crude oil and natural gas companies under the study are exposed in table 4.4.

Table 4.4. Descriptive Statistics of Debt-Equity Ratios.

	HOECL	ONGCVL	ONGCL	OIL	SETL	TPL	Industry Average
Mean	0.144	4.65	0.24	0.11	0.15	0.34	1.01
Maximum	0.59	18.36	1.05	0.50	0.71	1.17	3.59
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	.01
Std. Dev.	0.20	5.70	0.32	0.11	0.20	0.36	1.16
C. V. (%)	138.89	122.58	133.33	100	133.33	105.88	114.85
Skewness	1.14	1.43	1.27	2.37	1.35	1.02	1.28
Kurtosis	2.65	3.59	3.54	9.23	4.36	3.44	.19
Observations	20	20	20	20	20	20	20

Table 4.4 shows that debt-equity ratio of ONGCVL is 4.65, which is higher than the 1.01 grand industry average, which indicates that the company is capable to meet up its matured current obligations in every year. Again, a very lower debt-equity ratio is found in case of HOECL (0.144), ONGCL (0.24), OIL (0.11), SETL (0.15) and TPL (0.34). This illustrates an inauspicious circumstance to shell out their matured obligations in time. Coefficient of variation of debt-equity ratio of HOECL, ONGCVL, ONGCL and SETL is 138.89, 122.58, 133.33 and 133.33 respectively, which is higher than Industry average (114.85). It indicates that these companies depend not only upon short-term sources but also very much dependent on the long-term sources. While perfect consistency is observed for OIL (100) and TPL (105.88)

under study.

4.5. Descriptive Statistics of Stock Turnover Ratios

Stock turnover ratio designates the swiftness of exchange of stock into sales. By and large, a high stock turnover ratio points out resourceful management of stock because more frequently the stock is sold, the less amount of money is required to finance stock. A low stock turnover ratio confirms unproductive management of stock, over investment in stocks, deliberate business and poor quality of goods that bring about lower profit as compared to total investment. The stock turnover ratio of selected oil and natural gas companies are shown in table 4.5

Table 4.5. Descriptive Statistics of Stock Turnover Ratios.

	HOECL	ONGCVL	ONGCL	OIL	SETL	TPL	Industry Average
Mean	9.14	481.68	83.79	48.27	56.47	8.31	105.78
Maximum	16.64	2195.78	124.38	74.58	97.26	14.60	407.03
Minimum	2.73	57.60	56.56	30.66	11.24	3.26	35.4
Std. Dev.	4.63	726.83	20.92	11.71	27.09	3.75	116.18
C. V. (%)	50.65	150.89	24.97	24.25	47.97	45.13	109.83
Skewness	-0.071	1.54	0.71	0.44	-0.24	0.45	2.16
Kurtosis	1.54	3.51	2.35	2.42	1.93	1.87	2.29
Observations	20	20	20	20	20	20	20

Table 4.5 demonstrates a satisfactory outcome only for ONGCVL as mean value (481.68) much higher than grand industry average (105.78), taken as standard. It signifies that ONGCVL is in a position to convert stock into sales much quicker than other companies. But the mean values of HOECL, ONGC, OIL SETL and TPL are much lower than the grand industry average. It signifies that conversion of stock into sales is not satisfactory for these companies. But on the other hand the co-efficient of variation for HOECL(50.65), ONGCL(24.97), OIL (24.25), SETL(47.97), and TPL (45.13) is much lowering than grand industry average (109.83) taken as benchmark. It means the lower variation and higher stability in management of stock. In case of ONGCVL it is higher than industry average, which means higher variability and lower consistency in management of stock.

4.6. Descriptive Statistics of Debtors' Turnover Ratios

Trade debtors are expected to be converted into cash within a short period time and are included in current assets. A high debtors' turnover ratio designates a reasonable credit policy, higher sales, over investment in debtors or slow paying debtors. The higher the value of debtors' turnover the more efficient is the management of debtors or more liquid the debtors are. In the same way, low debtors' turnover ratio implies inefficient management of debtors. It is the reliable measure of the time of cash flow from credit sales. Debtors' turnover ratio of the selected companies under the study is shown in the following table 4.6.

Table 4.6. Descriptive Statistics of Stock Turnover Ratios.

	HOECL	ONGCVL	ONGCL	OIL	SETL	TPL	Industry Average
Mean	8.82	4.45	11.05	8.50	3.79	12.93	7.6
Maximum	44.79	11.94	16.11	20.81	9.91	112.59	28.99
Minimum	0.00	0.00	1.88	3.66	1.12	4.52	2.47
Std. Dev.	10.43	4.96	3.91	4.66	2.68	23.62	5.53
C. V. (%)	118.25	111.46	35.38	54.82	70.71	182.68	72.76
Skewness	2.24	0.46	-0.82	1.18	0.89	4.03	3.22
Kurtosis	8.16	1.46	2.83	3.58	2.67	17.55	12.75
Observations	20	20	20	20	20	20	20

Table 4.6 illustrates that debtors' turnover ratio is satisfactory for HOECL (8.82), ONGCL (11.05), OIL (8.5) and TPL (12.93) as the mean value is higher than the grand industry average (7.6). It means debtors are converted into cash quicker than other companies under study. But in case of ONGCVL (4.45) and SETL (3.79), it is lower than industry average that signifies an unsatisfactory debtor's turnover. On the other hand co-efficient variation of HOECL (118.25), ONGCVL (111.46), and TPL (182.68) is higher than industry average (72.73). It demonstrates less high inconsistency and unproductive management of debtors. But in case of ONGCL (35.38), OIL (54.82) and SETL (70.71) it is lower than industry average, it means lower inconsistency and resourceful management of debtors.

4.7. Descriptive Statistics of Creditors' Turnover Ratios

Creditors' turnover ratio is a signal of competence of the credit and payment policy that directly affect the liquidity position. Higher the credit payment period the longer is the age of creditors over and above improved is the management of liquidity while shorter the age of creditors explains inefficient and poor payment policy that is answerable to diminish current liabilities encumber and distress circumstance of liquidity position. Creditors' turnover ratio of six crude oil and natural gas companies in India under the study is furnished in table 4.7.

Table 4.7. Descriptive Statistics of Creditors' Turnover Ratios.

	HOECL	ONGCVL	ONGCL	OIL	SETL	TPL	Industry Average
Mean	0.98	2.56	6.48	8.20	5.42	1.02	4.56
Maximum	2.41	12.32	38.01	17.65	13.81	2.57	12.28
Minimum	0.06	0.14	1.27	3.91	0.78	0.08	1.5
Std. Dev.	0.74	3.46	8.07	3.88	3.31	0.84	2.33
C. V. (%)	75.51	135.15	124.54	47.32	61.07	82.35	51.10
Skewness	0.46	1.72	3.21	1.08	0.60	0.54	1.88
Kurtosis	2.04	4.84	12.99	2.97	3.05	1.82	5.81
Observations	20	20	20	20	20	20	20

Table 4.7 demonstrates that creditors' turnover ratio is satisfactory for ONGCL (6.48), OIL (8.2) and SETL (5.42) as the mean value is higher than the grand industry average (4.56), which means creditors are paid slower than other companies. But in case of ONGCVL (2.56) and TPL (1.02), it is lower than industry average. It suggests a substandard creditors' turnover. Conversely co-efficient of variation of HOECL (75.51), ONGCVL (135.15), and ONGCL (124.54), SETL (61.07) and TPL (82.35) is higher than industry average (51.10). It shows less high changeability and incompetent management of creditors. However, merely in case of OIL (47.32) it is lower than industry average, it means lower unpredictability and well-organized management of creditors.

4.8. Relationship Between Liquidity Management Performance Indicators and Profitability

The linear regression model utilized in this investigation is: $ROCE = \alpha + \beta_1 CR + \beta_2 QR + \beta_3 CPR + \beta_4 DER + \beta_5 STR + \beta_6 DTR + \beta_7 CTR + \epsilon_t$ (unexplained variables or error terms) Where α , β_1 , β_2 , β_3 , β_4 , β_5 , β_6 and β_7 are the parameters of the ROCE line.

4.9. Multiple Regression Test Results of ONGC Videsh Ltd.

The strength of the relationship between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability of ONGC Videsh Ltd. are given in table 4.8.

Table 4.8. Multiple Regressions of ONGC Videsh Ltd.

	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
(Constant)	-85.36	41.93	-2.04	.06	
CR	10.2	444.34	.02	.98	7904.21
QR	-2.58	443.42	-.01	1.00	8418.47
CPR	-1.43	19.90	-.07	.94	11.59
DER	3.82	2.57	1.48	.16	1.45
STR	.001	.03	.03	.97	2.48
DTR	6.43	4.41	1.46	.17	3.22
CTR	5.82	5.4	1.07	.31	2.40
R = 0.56	R ² = 0.31		Adjusted R ² = -0.09		F = 0.77
Std. Error of the Estimate = 53.10			Durbin-Watson = 2.64		p of F = 0.62

It was observed from the above that an increase in CR by one unit; the ROCE increased by 10.2 units that were statistically insignificant. When QR was increased by one unit, ROCE was decreased by 2.58 units that were also statistically insignificant. However, when CPR increased by one unit, the ROCE of the company decreased by 1.43 units, which was not statistically significant. When DER is increased by one unit, the ROCE of the company is also increased by 3.82 units, which was insignificant statistically. Again, three important indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE increased by 0.001, 6.43 and 5.82 units respectively which was statistically insignificant at 5 per cent level. The multiple correlations among the dependent variable ROCE and the independent

variables taken together were 0.56. It indicates that the profitability was moderately responded by its independent variables. It is also evident from the value of R² that 0.31 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R²) signifies that 9 per cent of the negative variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients being very high, demonstrates that there exists poor line of estimates among the variables. F value (0.77) indicates that the model is not perfectly fit and also the probability is more than 0.05. The VIF is too high in case of two independent variables CR and QR along with slightly high in case of CPR that is an indication of multicollinearity problems. An insignificant

variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. But Durbin-Watson statistics (2.64) indicates that residuals are not serially correlated. However, first of all, we have removed CR and QR from the regression model and set a new model of linear regression. The new regression model used in this

analysis is: $ROCE = \alpha + \beta_1 \text{CPR} + \beta_2 \text{DER} + \beta_3 \text{STR} + \beta_4 \text{DTR} + \beta_5 \text{CTR} + \varepsilon_t$ Table 4.9 discloses that multiple regression results between the dependent and independent variables has been authenticated because the result of tolerance and variance inflation factor satisfy the model, that is, VIF value does not exceed 2 after excluding the variable CR and QR.

Table 4.9. Multiple Regressions of ONGC Videsh Ltd.

	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
(Constant)	84.88	34.87	-2.434	.03	
CPR	-1.83	9.649	-.189	.85	1.96
DER	3.82	2.462	1.553	.15	1.44
STR	.41	.024	.029	.98	1.38
DTR	6.46	4.050	1.594	.14	1.95
CTR	5.79	5.016	1.153	.27	1.21
R = 0.61	R ² = 0.49		Adjusted R ² = 0.11		F = 0.97
Std. Error of the Estimate = 4.97			Durbin-Watson = 2.04		p of F = 0.48

The strength of the relationship between the dependent variable, ROCE and the independent variables taken together and the impact of these independent variables on the profitability are given in table 5.9. It was observed that an increase in CPR increased by one unit, the ROCE of the company decreased by 1.83 units that were statistically significant at 5 per cent level. When DER is increased by one unit, the ROCE of the company is also increased by 3.82 units but statistically insignificant. Again, three important indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE increased by 0.41, 6.46 and 5.79 units respectively though they were statistically insignificant. The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.61. It indicates that the profitability was highly responded by its independent variables. It was also evident from the value of R² that 0.49 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R²) signifies that 11 per cent variations in the ROCE are explained by the independent variables. Standard

Error of regression coefficients being low, demonstrates that there exists really line of estimates among the variables. F value (0.97) indicates that the model is perfectly fit even the probability is more than 0.05. The VIF is below thumb rule in case all the variables, these indicate that there are no multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. Also Durbin-Watson statistics (2.04) indicates that residuals are not serially correlated.

4.10. Multiple Regression Test Results of HOEC Ltd.

The strength of the relationship between the dependent variable, ROCE and all the independent variables taken together and the joint impact of these independent variables on the profitability of HOEC Ltd. are given in table 4.10.

Table 4.10. Multiple Regressions of HOEC Ltd.

	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
(Constant)	3.04	5.80	.53	.61	
CR	25.88	25.10	1.03	.32	413.89
QR	-17.12	27.00	-.63	.54	504.68
CPR	-6.97	8.13	-.86	.41	39.80
DER	-2.18	8.36	-.26	.80	2.11
STR	-.46	.51	-.91	.38	3.95
DTR	-.03	.17	-.16	.87	2.24
CTR	.30	2.55	.12	.91	2.57
R =0 .66	R² = 0.44		Adjusted R² = 0.11		F = 1.35
Std. Error of the Estimate = 5.14105			Durbin-Watson = 2.054		p of F = 0.310

It was observed from the above that an increase in CR by one unit; the ROCE increased by 25.88 units that were statistically insignificant at 5 per cent level. However, when

CPR, QR and DER increased by one unit, the ROCE of the company decreased by 6.97, 17.12 and 2.18 units respectively, that were statistically insignificant. Again, three

important indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE decreased by 0.46, 0.03 and increased by 0.30 units respectively which was statistically insignificant.

The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.66. It indicates that the profitability was moderately responded by its independent variables. It was also apparent from the value of R^2 that 0.44 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R^2) signifies that 11 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients is low, demonstrates that best fit to line of estimates among the variables. F value (1.35) indicates that the model is not perfectly fit and also the probability is more than 0.05. The VIF is too high in case of two independent variables CR and QR along with slightly high in case of CPR that is an indication of multicollinearity problems. An insignificant variability in profitability could be the result of

the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. Also Durbin-Watson statistics (2.054) indicates that residuals are not serially correlated. Table 4.10 reveals that multiple regression results between the dependent and independent variables has been unauthenticated because the result of tolerance and variance inflation factor cannot satisfy the model (even rule of thumb of statistics), that is, VIF value exceeds 5 (rule of thumb in statistics) or tolerance level of 0.20.

However, first of all, we remove CR and QR from the regression model and set a new model of linear regression. The new regression model used in this analysis is: $ROCE = \alpha + \beta_1 CPR + \beta_2 DER + \beta_3 STR + \beta_4 DTR + \beta_5 CTR + \epsilon_t$

Table 4.11 discloses that multiple regression results between the dependent and independent variables has been authenticated because the result of tolerance and variance inflation factor satisfy the model, that is, VIF value does not exceed 5 after excluding the variable CR and QR.

Table 4.11. Multiple Regressions of HOEC Ltd.

	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
(Constant)	4.83	4.75	1.02	.33	
CPR	1.96	1.67	1.17	.26	1.60
DER	2.16	7.18	.30	.77	1.48
STR	-.47	.47	-1.01	.33	3.21
DTR	.11	.15	.73	.48	1.70
CTR	.91	2.58	.35	.73	2.51
R = 0.56	R ² = 0.31		Adjusted R ² = 0.07		F = 1.28
Std. Error of the Estimate = 5.27			Durbin-Watson = 2.37		p of F = 0.33

The strength of the relationship between the dependent variable, ROCE and the independent variables taken together and the impact of these independent variables on the profitability of HOEC Ltd. are given in table 4.11. It was observed that an increase in CPR increased by one unit, the ROCE of the company increased by 1.96 units that were statistically insignificant. When DER is increased by one unit, the ROCE of the company is also increased by 2.16 units that were also statistically insignificant. Again, three important indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE decreased by 0.47 and ROCE increased by 0.11 and 0.91 units respectively which was statistically insignificant.

The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.56. It indicates that the profitability was moderately responded by its independent variables. It was also evident from the value of R^2 that 0.31 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R^2) signifies that 7 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression

coefficients being low, demonstrates that there exists really line of estimates among the variables. F value (1.28) indicates that the model is perfectly fit and also the probability is more than 0.05. The VIF is below in case all the variables this indicates that there are no multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. Also Durbin-Watson statistics (2.37) indicates that residuals are not serially correlated.

4.11. Multiple Regression Test Results of ONGC Ltd.

The force of the association between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability of ONGC Ltd. are given in table 4.12.

It was detected that an increase in CR by one unit; the ROCE decreased by 4.06 units that were statistically significant at 5% level. However, when QR, CPR and DER increased by one unit, the ROCE of the company decreased by 2.71 in case of QR which were statistically insignificant

and ROCE increased by 5.66 and 0.76 units respectively in case of CPR and DER, where CPR were statistically insignificant and DER is statistically significant at 1 per cent

level as the significance value is less than 0.01.

Table 4.12. Multiple Regressions of ONGC Ltd.

	Unstandardized Coefficients		t	Sig.	Colinearity Statistics
	B	Std. Error			VIF
(Constant)	2.21	7.03	.31	.76	
CR	-4.06	1.66	-2.45	.03	3.89
QR	-2.71	3.58	-.76	.47	2.73
CPR	5.66	7.42	.76	.46	1.35
DER	.76	.15	5.03	.00	1.16
STR	.01	.06	.07	.95	2.03
DTR	1.20	.38	3.17	.01	3.39
CTR	.49	.22	2.27	.04	4.75
R = 0.94	R ² = 0.87		Adjusted R ² = 0.80		F = 11.85
Std. Error of the Estimate = 3.50			Durbin-Watson = 2.31		p of F = 0.00

Again, three important indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE increased by 0.01, 1.20 and 0.49 units respectively where STR was statistically insignificant and DTR and CTR were significant statistically at 5% level.

The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.94. It indicates that the profitability was strongly responded by its independent variables. It is furthermore manifest from the value of R² that 87 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R²) signifies that 80 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients is low (3.50), demonstrates that best fit to line of estimates among the variables. F value with probability

indicates that the model is perfectly fit. The VIF values are lower than thumb rule that indicates that there were no multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. Also Durbin-Watson statistics (2.31) indicates that residuals are not serially correlated.

4.12. Multiple Regression Test Results of OIL India Ltd.

The strength of the relationship between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability of OIL India Ltd. are given in table 4.13.

Table 4.13. Multiple Regressions of OIL India Ltd.

	Unstandardized Coefficients		t	Sig.	Colinearity Statistics
	B	Std. Error			VIF
(Constant)	-1.15	11.75	-.10	.92	
CR	8.16	14.84	.55	.59	54.09
QR	-13.14	17.83	-.74	.48	114.06
CPR	5.75	6.64	.87	.40	25.85
DER	-24.54	32.68	-.75	.47	7.37
STR	.05	.23	.21	.84	4.19
DTR	1.11	.56	1.98	.07	3.91
CTR	1.25	.46	2.73	.02	1.80
R =0.82	R²=0.67		Adjusted R² = 0.48		F = 3.54
Std. Error of the Estimate =5.77			Durbin-Watson = 2.12		p of F =0.03

It was observed that an increase in CR by one unit; the ROCE increased by 8.16 units that were statistically insignificant. However, when QR, DER and CPR increased by one unit, the ROCE of the company decreased, increased and decreased by 13.14, 5.75 and 24.54 units respectively, which were statistically insignificant. Again, three vital indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE increased by 0.05, 1.11 and 1.25 units respectively which was statistically insignificant.

The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.82. It points out that the profitability was strongly responded by its independent variables. It is moreover marked from the value of R² that 0.67 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R²) signifies that 48 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression

coefficients is low (5.77), demonstrates that best fit to line of estimates among the variables. F value (3.54) indicates that the model is perfectly fit and also the probability is less than 0.05. The VIF is too high in case of two independent variables CR and QR along with slightly high in case of CPR that was an signal of multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. Also Durbin-Watson statistics (2.31) indicates that residuals are not serially correlated. Table 4.14 reveals that multiple regression results between the dependent and independent

variables have been unauthenticated because the result of tolerance and variance inflation factor cannot satisfy the model. However, first of all, we have removed CR and QR from the regression model and set a new model of linear regression. The new regression model used in this analysis is: $ROCE = \alpha + \beta_1 CPR + \beta_2 DER + \beta_3 STR + \beta_4 DTR + \beta_5 CTR + \epsilon_t$ Table 4.14 discloses that multiple regression test results between the dependent and independent variables has been authenticated because the result of tolerance and variance inflation factor satisfy the model, that is, statistical thumb rule.

Table 4.14. Multiple Regressions of OIL India Ltd.

	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
(Constant)	-3.81	10.66	-.36	.73	
CPR	-.22	2.13	-.10	.92	2.86
DER	-16.81	16.60	-1.01	.33	2.05
STR	.07	.22	.31	.76	4.14
DTR	1.14	.52	2.20	.05	3.59
CTR	1.20	.42	2.89	.01	1.61
R = 0.80	R ² =0.65		Adjusted R ² = 0.52		F = 5.13
Std. Error of the Estimate = 5.56			Durbin-Watson = 1.83		p of F = .01

Table 4.15. Multiple Regressions of SELAN Ltd.

	Unstandardized Coefficients		t	Sig.	Colinearity Statistics
	B	Std. Error			VIF
(Constant)	11.61	11.73	.99	.34	
CR	30.35	18.35	1.65	.12	328.89
QR	-37.54	20.89	-1.80	.10	383.98
CPR	7.62	5.29	1.44	.18	24.21
DER	-2.78	19.56	-.14	.89	2.82
STR	-.11	.14	-.83	.42	2.61
DTR	.06	2.07	.03	.98	5.98
CTR	1.05	1.13	.93	.37	2.72
R =0.75	R ² = 0.56		Adjusted R ² = 0.30		F = 2.16
Std. Error of the Estimate = 9.92			Durbin-Watson = 1.86		p of F = 0.12

Now it was observed that an increase in CPR and DER by one unit, the ROCE of the company decreased by 0.22 and 16.81 units respectively that were statistically insignificant. Again, three important indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE increased by 0.07, 1.14 and 1.20 units respectively where DTR and CTR were significant statistically at 5 per cent and 1 per cent level. The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.80. It indicates that the profitability was strongly responded by its independent variables. It was moreover obvious from the value of R² that 0.65 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R²) signifies that 52 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients being low (5.56), demonstrates that there exists really line of estimates among the variables. F value (5.13) indicates that the model is perfectly fit and also the

probability is equal to 0.01. The VIF is below than thumb rule in case all the variables, which indicates that there are no multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. In addition Durbin-Watson statistics (1.83) designates that residuals are not serially correlated.

4.13. Multiple Regression Test Results of SELAN Ltd.

The potency of the affiliation between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability of SELAN Ltd. are specified in table 5.15. It was observed that an increase in CR by one unit, the ROCE increased by 30.35 units that were statistically insignificant. On the other hand when QR was increased by one unit, ROCE is decreased by 37.54 units which were also

insignificant statistically. Nonetheless, when DER and CPR increased by one unit, the ROCE of the company decreased and increased by 2.78 units and 7.62 units respectively, which were statistically insignificant. Again, three significant indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE decreased, increased and increased by 0.11, 0.06 and 1.05 units respectively, which was statistically insignificant in all the cases.

The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.75. It indicates that the profitability was strongly responded by its independent variables. It is furthermore apparent from the value of R^2 that 0.56 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R' square (R^2) signifies that 30 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients is low (9.92), demonstrates that best fit to line of estimates among the variables. F value (2.16) indicates that the model is not perfectly fit because the probability is more

than 0.05. In addition Durbin-Watson statistics (1.83) designates that residuals are not serially correlated. The VIF is too high in case of two independent variables CR and QR along with slightly high in case of CPR that is a warning of multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. In addition Durbin-Watson statistics (1.86) designates that residuals are not serially correlated.

However, we have removed CR and QR from the regression model and set a new model of linear regression. The new regression model used in this analysis is: $ROCE = \alpha + \beta_1 CPR + \beta_2 DER + \beta_3 STR + \beta_4 DTR + \beta_5 CTR + \epsilon_t$

Table 4.16 discloses that multiple regression results between the dependent and independent variables has been authenticated because the result of tolerance and variance inflation factor satisfy the model, that is, VIF value does not exceed thumb rule of statistics.

Table 4.16. Multiple Regressions of SELAN Ltd.

Model	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
(Constant)	-.67	10.03	-.07	.95	
CPR	.82	1.57	.52	.61	1.92
DER	-12.92	19.27	-.67	.51	2.47
STR	-.04	.14	-.28	.79	2.33
DTR	2.96	1.44	2.05	.06	2.61
CTR	.65	1.11	.59	.57	2.34
R = 0.66	R ² = 0.43		Adjusted R ² = 0.23		F = 2.10
Std. Error of the Estimate = 10.43			Durbin-Watson = 1.38		p of F = 0.13

Table 4.17. Multiple Regressions of TATA Petrodyne Ltd.

	Unstandardized Coefficients		t	Sig.	Colinearity Statistics
	B	Std. Error			VIF
(Constant)	56.77	5.47	10.37	.00	
CR	-5.82	5.57	-1.04	.32	12.09
QR	-11.79	5.77	-2.04	.06	10.34
CPR	-6.33	6.25	-1.01	.33	7.87
DER	-7.36	5.56	-1.32	.21	2.36
STR	-2.40	.45	-5.32	.00	1.71
DTR	-.14	.07	-1.87	.09	1.84
CTR	.04	2.16	.02	.99	1.94
R =0.97	R² = 0.94		Adjusted R² = 0.91		F = 27.34
Std. Error of the Estimate = 5.66			Durbin-Watson = 2.26		p of F = 0.00

The strength of the relationship between the dependent variable, ROCE and the independent variables taken together and the impact of these independent variables on the profitability of SELAN Ltd. are given in table 5.16. It was observed from the above that an increase in CPR by one unit, the ROCE of the company increased by 0.82 units and an

increase in DER by one unit, the ROCE of the company decreased by 12.92 units, that were statistically insignificant. Again, two important indicators of efficiency DTR and CTR, increased by one unit, ROCE increased by 2.96, 0.65 units respectively, however one unit increase in STR will result 0.04 units decrease in ROCE of the company, which was

statistically insignificant.

The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.66. It indicates that the profitability was strongly responded by its independent variables. It is also evident from the value of R^2 that 0.43 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R^2) signifies that 23 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients being slightly high (10.43), demonstrates that there exists really line of estimates among the variables. F value (2.10) indicates that the model is perfectly fit and also the probability is more than 0.05. The VIF is below the thumb rule statistics in case of all the variables, which points toward that there are no multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. In addition Durbin-Watson statistics (1.38) designates that residuals are not serially correlated.

4.14. Multiple Regression Test Results of TATA Petrodyne Ltd.

The strength of the relationship between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability of TATA Petrodyne Ltd. are given in table 4.17.

It was observed that an increase in CR and QR by one unit; the ROCE decreased by 5.82 and 11.79 units that were statistically insignificant. However, when CPR and DER increased by one unit, the ROCE of the company decreased by 6.33 and 7.36 units respectively. DER and CPR were statistically insignificant at 5 per cent level as the insignificance value is more than 0.05. Again, three

important indicators of efficiency, STR, DTR and CTR, increased by one unit, ROCE decreased, decreased and increased by 2.40, 0.14 and 0.04 units respectively. STR was statistically significant at 5 per cent level but DTR and CTR were statistically insignificant.

The multiple correlations among the dependent variable ROCE and the independent variables taken together were 0.97. It indicates that the profitability was strongly responded by its independent variables. It is also evident from the value of R^2 that 0.94 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R^2) signifies that 91 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients is low (5.66), demonstrates that best fit to line of estimates among the variables. F value (27.34) indicates that the model is perfectly fit and also the probability is less than 0.05. The VIF is too high in case of two independent variables CR and QR along with slightly high in case of CPR that is an indication of multicollinearity problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. Besides Durbin-Watson statistics (2.26) designates that residuals are not serially correlated.

However, we have removed CR and QR from the regression model and set a new model of linear regression. The new regression model used in this analysis is: $ROCE = \alpha + \beta_1 CPR + \beta_2 DER + \beta_3 STR + \beta_4 DTR + \beta_5 CTR + \epsilon_t$

Table 4.18 discloses that multiple regression results between the dependent and independent variables has been authenticated because the result of tolerance and variance inflation factor satisfy the model, that is, VIF value does not exceed the thumb rule of statistics.

Table 4.18. Multiple Regressions of TATA Petrodyne Ltd.

	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
(Constant)	49.001	6.573	7.455	.000	
CPR	-26.339	3.155	-8.349	.000	1.147
DER	-9.081	7.315	-1.241	.235	2.342
STR	-2.025	.575	-3.520	.003	1.583
DTR	-.056	.093	-.605	.555	1.648
CTR	-.913	2.222	-.411	.687	1.171
R = 0.94	R ² = 0.88		Adjusted R ² = 0.84		F = 20.49
Std. Error of the Estimate = 7.48			Durbin-Watson = 1.44		p of F = 0.00

The strength of the relationship between the dependent variable, ROCE and the independent variables taken together and the impact of these independent variables on the profitability of TATA Petrodyne Ltd. are given in table 5.18. It was observed from the above that an increase in CPR and DER by one unit, the ROCE of the company decreased by 26.34 and 9.08 units respectively. CPR statistically

significant at 1 per cent level but DER was not significant statistically. Again, three important indicators of efficiency STR, DTR and CTR, increased by one unit, ROCE decreased in all cases by 2.03, 0.06 and 0.91 units respectively. DTR and CTR were statistically insignificant whereas STR was statistically significant at 1 percent level.

The multiple correlations among the dependent variable

ROCE and the independent variables taken together were 0.94. It indicates that the profitability was strongly responded by its independent variables. It is also evident from the value of R^2 that 0.88 per cent of variation in ROCE was accounted by the joint variation in independent variables. Adjusted 'R'square (R^2) signifies that 84 per cent of the positive variations in the ROCE are explained by the independent variable. Standard Error of regression coefficients being low (7.48), demonstrates that there exists really line of estimates among the variables. F value (20.49) indicates that the model is perfectly fit and also the probability is less than 0.05. The VIF is below the thumb rule of statistics in case all the variables, these point out that there are no multicollinearity

problems. An insignificant variability in profitability could be the result of the composite effect adopted in the analysis as well as many other liquidity management related unexplained variables. Besides Durbin-Watson statistics (2.26) designates that residuals are not serially correlated.

4.15. Test of Hypotheses

To test the select hypotheses, subsequent implications may be depicted:

H_1 : liquidity position and its management are very much satisfactory.

Table 4.19. Sample Test

	t	df	Prob. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
All independent variables and ROCE	2.684	19	.003	10.24250	-13.5747	34.0597

Since the probability is more than 0.05, the null hypothesis is not rejected. Therefore, liquidity position and its management are not satisfactory.

H_2 : liquidity and profitability are associated significantly.

Table 4.20. Sample Test

	R	R2	Adjusted R2	t	Sig.
ROCE	0.794	0.723	0.682	1.068	0.166

Multiple regression tests indicate that the probability of t-value is more than 0.05 and the null hypothesis is rejected. Therefore, liquidity and profitability are associated significantly. This indicates that liquidity indicators significantly affect the profitability under study.

5. Conclusions and Recommendations

Liquidity position and its management are of fundamental significance in the choice of financial management. The most favourable of liquidity position and its management is could be attain by a concern so as to handle the swapping between liquidity indicators and profitability. Descriptive statistics indicate that liquidity position is satisfactory in case of ONGCVL, OIL and SETL but their overall liquidity management are not good every year. Multiple regression test results indicate that profitability and liquidity management indicators are associated, questionable in the case of liquidity efficiency indicators, that is, management of inventory, credit policy and payment policy. It recommends that liquidity management should have been improved in the near future. Also companies have to concern more in case of unexplained variables, which is, imports, exports, utilisation of production capacity, etc.

This research work is crucial for Indian economy because all the petroleum products, transports, energy generation etc. purely depends on crude oil and natural gas. Due to rupee depreciation, increase in dollar demand, high inflation rates and extra imports of crude oil and natural gas, Indian

economy have been negatively influenced by these factors.

This study bears a few limitations. This study did not considered imports, exports, utilisation of production capacity and production. This research work has been based on only CMIE data of six companies. The liquidity management performance is not compared between public and private crude oil and natural gas companies.

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